PIPEWORK DISPLACEMENT MONITORING

Providing confidence in structural integrity of piping installation by performing a pipework displacement survey on the LNG Header and HP Drain Lines.

THE PROBLEM

An LNG Terminal Operator had a requirement to monitor the expansion of one of their LNG header lines as part of a scheduled maintenance task where the line operating temperature was increased from -140°C to -110°C.

Concerns were raised regarding the potential for excessive pipework movement generated by expansion due to the change in process temperature.

As cold nitrogen is injected to 'warm' the line, AVT Reliability (AVTR) were requested to measure the expansion of the line relative to the supporting structure around the floating pipe shoe supports.



OUR APPROACH

AVT Reliability's Asset integrity Division (AID) installed displacement sensors and connected to a HBM QuantumX multi-channel data acquisition system (DAQ) to record displacement data of the pipework during process change trials.

Sensors were installed at 4 No. locations on the LNG Header and HP Drain Lines, with each sensor attached to the pipe support feet and support sliding base using a combination of magnets and spacers.

Each sensor was fitted with a length of extension cable to connect to the data acquisition system housed within a temporary weatherproof shelter located close by in a safe area.

The DAQ system was set to continuously monitor pipework displacement data whilst process conditions were altered according to the customer's service plan.



OUR FINDINGS

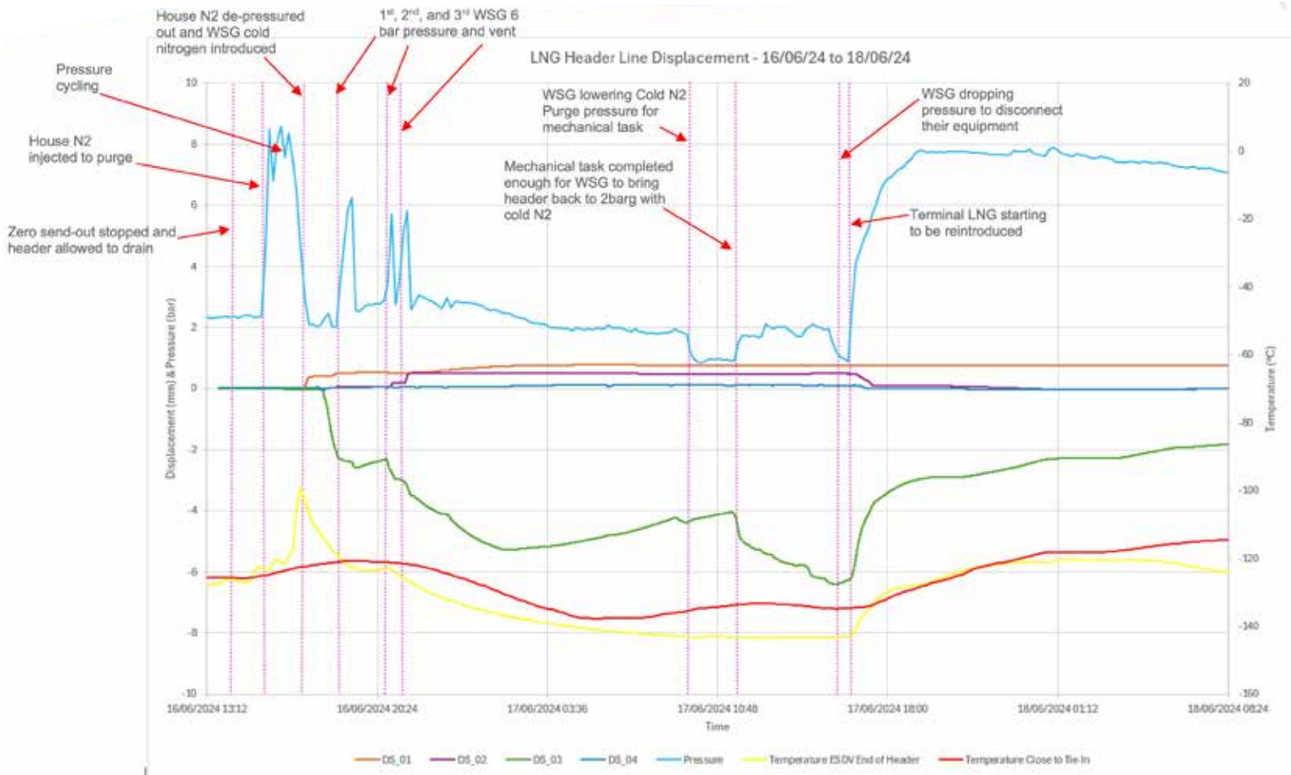
Displacement data was trended alongside line temperatures at the end of the header line and at a pipe location close to drain line tie-in. Header pipework pressure data was also included together with references to process conditions.

Analysis of the data showed maximum pipework displacement of 6.4mm at the North end of the Header pipework, with the maximum displacement measured during the final stages of the Nitrogen purge.

The data shows how the pipework then recovers over the subsequent 16 hours following the reintroduction of LNG to the line to a position 1.8mm South of its starting position at completion of the survey.

THE SOLUTION

AVTR were able to monitor live pipework movement during a critical maintenance task and provide the customer with confidence that pipework movement generated by the change in process conditions was within an acceptable range.



SERVICE MATTERS

CONTACT

If your plant is facing similar issues, reach out to AVT Reliability for expert support in condition monitoring, pipework vibration and lubrication management.

We're here to keep your operations running smoothly.

AVT Reliability Ltd Head Office
Unit 2, Easter Court
Europa Boulevard
Warrington, Cheshire,
WA5 7ZB

W: avtreliability.com
T: +44 (0)161 486 3737
E: enquiries@avtreliability.com

"Displacement Sensor Installation and Monitoring ensures confidence that excessive pipework movement will not occur during critical maintenance operation"