

Compressor vibration and failures of small bore piping and tubing

SRJ CASE STUDY, 2021



PROBLEM

During the commissioning of a large variable speed motor driven compressor, high vibration levels were experienced on the discharge piping which resulted in the failure of small bore connections and instrument tubing.

SRJ was engaged to perform a vibration survey and identify the root cause of the vibration problem.

The compressor problem was delaying plant commissioning for which the engineering contractor would be penalised for liquidated damages (LDs) .

SRJ SOLUTION

SRJ conducted a vibration survey of the compressor pipework and identified tonal noise and vibration occurring when the compressor reduced speed or tripped. The measured frequencies were not coincident with a compressor excitation frequency.

An acoustic simulation model was constructed of the discharge piping, which was used to assess potential pulsation sources to identify the root cause of the noise and vibration.

The excitation was identified as vortex shedding over a back passing check valve which coupled with a piping acoustic resonance.

On removal of the check valve it was found to be damaged, but also of an unsuitable type to ensure leak tight closure.

The proposed solution was to replace the check valve with one with a guided sealing plate.

Once the new check valve was installed the vibration problem was eliminated.

DELIVERED VALUE



TIMELY DELIVERY

SRJ identified the root cause and provided a solution to the problem in under a week.



PENALTIES AVOIDED

The plant operator was pleased with the solution and decided against penalising the engineering contractor for commissioning delays.



PROBLEM SOLVED

With the remedial solution implemented the noise and vibration problem was eliminated



SRJ provides specialised consultancy services.
Contact us for more information.

david.capeling@srj-technologies.com
bill.skales@srj-technologies.com

SRJ Technologies Group plc
www.srj-technologies.com

All Rights Reserved
Company Number 115590
© 2022 SRJ Technologies Group plc

