

MAINLINE BLOCK VALVES PIPELINE BLOWDOWN



FOCUS AREA

Midstream Operations

SECTOR

Oil and Gas

SERVICE

Noise Impact Assessment

► CHALLENGE

In 2014 Patching Associates was retained by an engineering consulting firm on behalf of an oil and gas company to investigate the acoustical effects and assess noise impacts of future gas blowdown operations at three representative Mainline Block Valve (MLBV) sites along a proposed natural gas pipeline route in British Columbia.

Patching Associates was tasked with providing mitigation recommendations to minimize noise impacts and occupational exposure levels.

The study objectives were to:

- Ensure that noise impacts at the residences located near each of the MLBV sites along the pipeline route during any blowdown events met the requirements of the British Columbia Oil and Gas Commission (BCOGC) Noise Control Best Practices Guidelines.
- Predict noise levels within 100m of the proposed blowdown pipe for the purpose of assessing and controlling occupational noise exposure levels.
- Recommend practical blowdown noise silencers at each MLBV site that would minimize occupational exposure levels and noise impacts at the residences of concern.

Through effective communication with the client, Patching Associates was able to accurately understand the process conditions and flow parameters at each MLBV site thereby improving the accuracy of the noise emission calculation.

► SOLUTION

Patching Associates completed a detailed NIA for a typical blowdown event at three selected sensitive MLBV sites along the proposed pipeline route, assuming maximum flow rates and full blowdown of the applicable MLBV pipe section. Noise levels were predicted within 100m of the proposed blowdown pipe nozzle for the purpose of assessing and controlling occupational noise exposure levels.

The scope of work also included the prediction of time varying sound levels at various distances from the blowdown pipe nozzle from start of blowdown to completion.

To ensure more realistic noise emission levels in the noise model for reasonable characterization of the blowdown event noise at each MLBV site, Patching Associates developed a noise analysis tool that estimated noise emission levels based on process conditions and flow parameters. A time-varying graphical illustration of the sound levels was created during depressurization of the pipe section from start of blowdown to completion, at distances of interest.

Based on the results of the NIA, Patching Associates recommended an appropriate blowdown silencer with diffusers on the vent pipe nozzle that would reduce the noise emission to meet regulatory requirements.

► RESULT

It was determined that, based on the model results and after the installation of the recommended blowdown silencer at each MLBV site, the BCOGC noise limits were met at the receivers of interest near each of the MLBV site.

It was also determined that employee noise exposure levels at the distances of interest would be within the recommended noise exposure limits stipulated in the British Columbia Occupational Health and Safety.



PROJECT HIGHLIGHTS

- Patching Associates ensured that realistic and accurate sound power levels were utilized in the noise model.
- High-precision, Class 1 Brüel and Kjaer sound meters were used for conducting field measurements.
- Through effective communication with the client, Patching Associates was able to accurately understand the process conditions and flow parameters at each MLBV site thereby improving the accuracy of the noise emission calculation.

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