# > CaseStudy

Oil & Gas

## Gas Processing Plant Expansion

**Company**
Gas Processing Operator

**Sector**
Oil and Gas

**Service**
Noise Impact Assessment

## Challenge

In 2011, Patching Associates was retained by a major oil and gas operator to complete a Noise Impact Assessment (NIA) for the addition of proposed equipment to an existing compressor station located at a gas processing plant in southern Alberta. The proposed equipment needed to comply with both the operator's internal noise criteria as well as with the Alberta Energy Regulator (AER) Directive 038: Noise Control regulations. The operator's criteria required that the predicted noise levels from any expansion are not to exceed the noise levels from 2006, a baseline level when the criteria was established at all three residences existing in the area. However, in 2006, the facility noise levels were measured only at the nearest residence, and no noise model was produced to quantify the facility individual equipment noise emissions.

The 2011 study had four main objectives:

- Establish criteria target noise levels for the remaining two residences.
- Predict facility noise levels after the addition of the proposed equipment, and compare with target noise levels and Directive 038 requirements.
- Design a noise control plan to bring facility noise levels to target levels.
- Demonstrate that facility levels were maintained within the target levels by measuring the levels at the nearest residence.

Through the use of noise source diagnostics, Patching Associates was able to identify the dominant noise sources, and ensure target noise levels and regulatory requirements were met for the facility expansion.

## Solution

Measurements from all noise-emitting equipment were performed at the facility, and a noise model of the facility and the area was built. The model was then calibrated to match the noise levels measured at the nearest residence in 2006, under similar conditions. Target levels for the remaining two residences were determined from the model predicted levels. This calibrated model became the Base Noise model for all future facility expansions.

The proposed equipment noise emissions were added to the Base Model using acoustical theory. The predicted noise levels at the residences were calculated and compared to the target levels.

The noise control plan was designed to meet the criteria for all the residences. This involved silencing building ventilations, cooler units and building skids.

Once the noise control recommendations were completed, noise monitoring was performed at the nearest residence to confirm that the actual levels remained within target noise levels. Additionally, the noise emissions from the newly added equipment and the newly silenced equipment were measured at the facility to update the source emissions in the noise model.

## Result

A first round of measurement follow-up confirmed that the noise control was implemented correctly. However, one of the residents had expressed that the facility noise levels were perceived to have increased over time. The claim was investigated in a second round of follow-up measurements, and it was found that the cause of the noise increase came from an existing building roof vent which had deteriorated over time. This equipment was added on to the revised noise control plan for corrective action.

Patching Associates was able to assist the operator in continuing to meet internal noise control targets and AER Directive 038 criteria.

## Recommendations

- Addition of a cooler silencer to the proposed equipment at the design stage.
- Addition of ventilation silences to some of the building ventilation units.
- Installation of skid enclosures to the proposed equipment building skids.
- Inspect and perform repairs or modifications to the deteriorated roof vent unit.


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