# > CASESTUDY

POWER GENERATION

# LM 6000 TURBINE GENERATOR POWER PLANT

**COMPANY**
The City of Medicine Hat Electric Utility

**FOCUS AREA**
Cumulative Impacts

**SERVICE**
Noise Impact Assessment

## CHALLENGE

In 2014, Patching Associates was retained by the City of Medicine Hat Electric Utility to conduct a Noise Impact Assessment (NIA) for the proposed LM6000 Turbine Generator facility. The project was awarded in June 2014 and the final report was submitted in September 2014.

The objectives of the study were:

- To confirm that cumulative noise emissions from the normal operation of the proposed LM6000 Turbine Generator facility and adjacent existing facilities met Alberta Utilities Commission (AUC) Rule 012 requirements.
- To receive AUC approval to install the proposed Power Plant, by demonstrating facilities in the study area met the Permissible Sound Level (PSL) of 40 dBA Leq nighttime at the most impacted receiver.
- To meet the City of Medicine Hat Noise Bylaw No. 1926.
- To accurately quantify sound power levels from other existing facilities in the study area.
- To utilize accurate and realistic noise emissions data in the noise model to minimize the amount of conservative assumptions.
- Where required, to recommend practical and cost-effective noise control measures to meet the PSL at the most impacted receiver.

"Patching Associates utilized experienced technical and dedicated project management staff. This helped to deliver both superior technical value for the client within the agreed budget and time."

## Solution

To achieve the project goals, a detailed NIA was required. Patching Associates referenced noise emission data for the proposed LM6000 unit from General Electric (GE), field measurement data previously completed by Patching Associates in June 2013 for the existing nearby facilities, and data obtained from the AUC Application for another Wind Turbine project.

Patching Associates had previously measured sound power levels in June 2013 from a similar transformer located at the North Industrial Substation. These measurements were utilized and calibrated to meet the target noise levels specified in the Test Report provided by the supplier for the proposed Station Service Transformer.

By utilizing field data and manufacturer's data as much as possible in the NIA, conservative assumptions were minimized, thereby improving the model accuracy.

In order to complete a cumulative effects assessment of the noise impacts, Patching Associates modeled all existing facilities in the study area that would be operating at the same time as the proposed Power Plant.

## Result

It was determined that the predicted cumulative sound level from the normal operation of the proposed LM6000 Turbine Generator Power Plant, in combination with all other existing facilities in the study area met the AUC Permissible Sound Level of 40 dBA Leq nighttime at the most impacted receiver. The predicted sound levels also met the City of Medicine Hat Bylaw 1926 requirements.

Patching Associates minimized modeling assumptions and conservation by analyzing multiple data sources, including past and current field measurements, and manufacturer data. This approach resulted in an accurate model that achieved the project objectives.

## Project Highlights

- Realistic and accurate sound power levels were used in the noise model thereby minimizing conservative assumptions and improving model accuracy.
- High-precision, Class 1 Brüel and Kjaer sound meters were used for conducting field measurements.
- Data was implemented in an advanced noise modeling software (CadnaA) for the prediction of outdoor sound propagation.


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