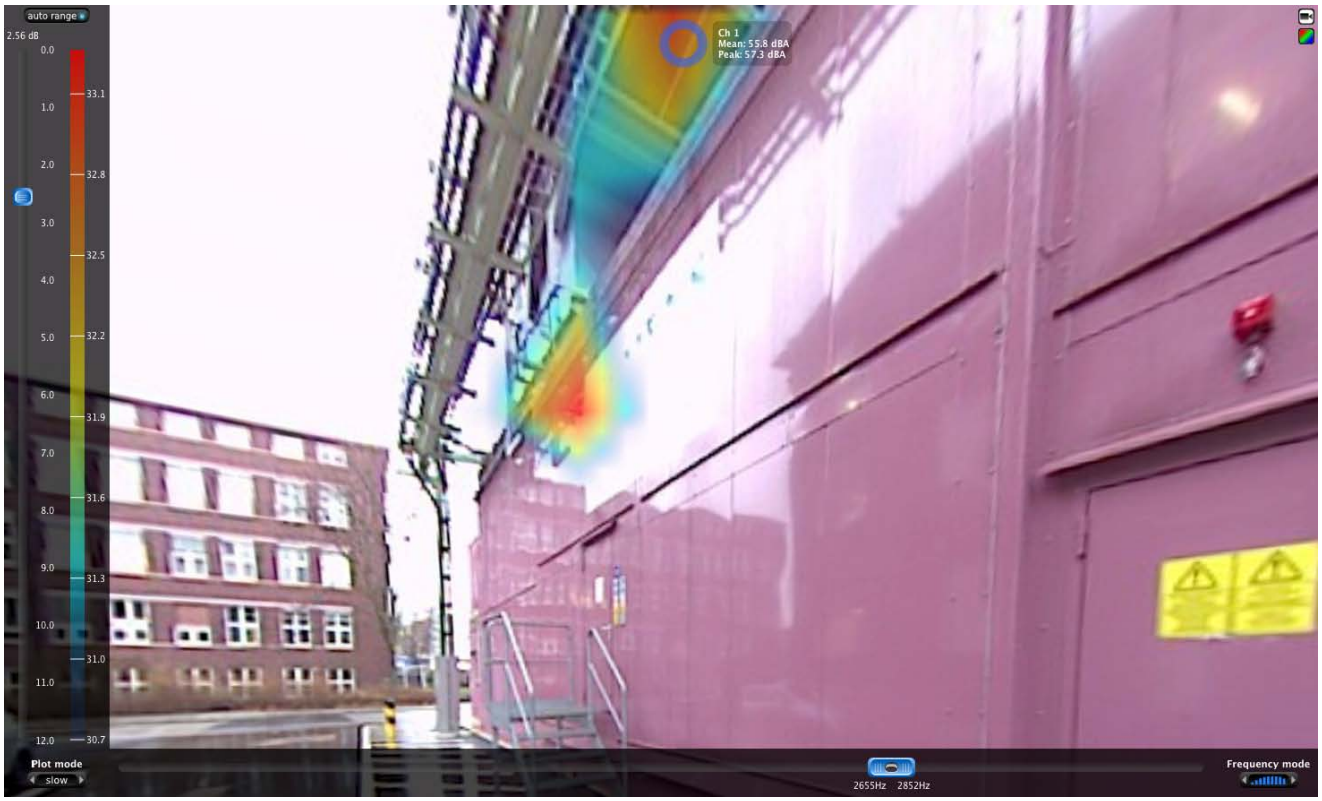
Nor848A Acoustic camera

Siemens Industrial Turbomachinery AB



Measurements on Gas Turbines installed by Siemens in Frankfurt, Germany

Problem

Two large gas turbines (approximately 25m x 12m x 10m) were installed in an industrial area nearby an office building. The gas turbines generate a tonal noise component at around 2700Hz caused by the inlet channel blades pass frequency. This tone imposes a more stringent noise requirement on the supplier, forcing noise reducing actions being made on the turbine.

Measurements and noise source identification with traditional methods (i.e. Sound Intensity with probe) is impossible, partly because of the gas turbine size but also because of the interference tone is represented over a larger area around the turbine, with only small dynamic noise level difference, where it´s very difficult to determine direction of the sound.

Measurement

The acoustic camera was placed at several points around the gas turbine, partly to see if the tone was leaked from multiple sources. But also to see if detected leakages are repeated and not an effect of reflections or measurement artifacts.

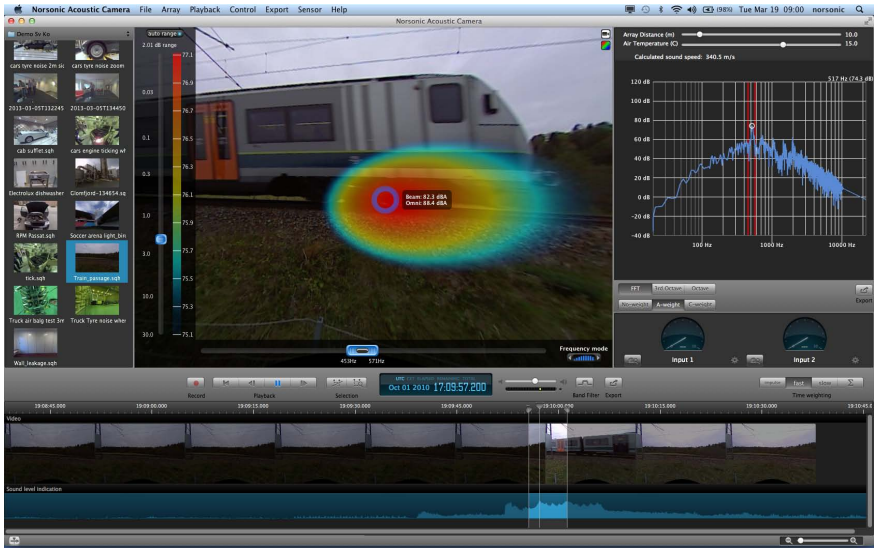
The measurement system's Virtual microphone feature was also extremely useful, with this function you can (even in real time!) scan and listen to the desired spots in the image, and also filter the listening function to desired frequency range. This way you can listen only to the pure tone leakages.

Result

With the acoustic camera it was possible to detect the tonal sound of the most crucial parts of the turbine. This meant that they could focus on and implement noise reduction actions in the right places. Instead of the traditional and difficult, step by step action method, which in the end could have been very expensive for the supplier.

Nor848A Acoustic camera

The Norsonic Nor848A acoustic cameras sets a new standard for acoustical cameras. The large number of microphones eliminates the problems of ghost-spots, compared to traditional acoustical cameras where the relatively low number of microphones increases the side lobe effect, resulting in the so called ghost- spot effect: You “measure” a non-existing source.



The Nor848A software is extremely intuitive and easy to use. Just after a few minutes of training, the user is able to operate the system and do real measurements. Three camera frontends are available: A 0.4 meter array holding 128 microphones, a 1 meter array holding 256 microphones and a 1.6 meter array with 384 microphones. The system enables the user to perform noise analysis with a clear view of where the different noise sources are located in real time.

The system is ready to measure in just a few minutes after entering the site. By moving the cursor in the picture you may analyze and listen to the sound in the selected directions while doing the measurements. This enables the user to identify the problem, whether it is an annoying sound, a leakage or other difficult noise problems in just a fraction of time compared to traditional methods.

SIEMENS

Siemens is one of the largest companies in the health, energy and industrial industry. The group has over 360,000 employees in over 190 countries.

Siemens Industrial Turbomachinery AB (SIT AB) based in Finspångsvägen in Östergötland, Sweden, delivers power plants and turbines with high efficiency and low emissions. They have about 2,800 employees and annual sales of approximately SEK 10 billion.

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