APPLICATION NOTE





2D Outdoor Measurement THE ACOUSTIC CAMERA AS A TOOL FOR SOUND SOURCE LOCALIZATION

TASK

Some residents of the Vattenfall power plant in Lichterfelde complained about a repeated wind noise (whistling), which occurs in moderate to strong winds. A precise localization of the sound source has been unsuccessful so far. The main sound source should be located in order to be able to take effective measures.

SOLUTION

Using the Acoustic Camera, noise sources can be precisely determined and documented in the shortest possible time. In the first step, an overview measurement of the entire power plant is carried out to localize the interference area. For a more precise analysis of the sound sources found, follow-up measurements are then conducted in close proximity. Based on these measurement results, efficient sound insulation measures can be taken. Subsequent measurements with the Acoustic Camera allow a before-and-after comparison to check the effectiveness of the measures. The system can remain in operation during the measurement, requiring no downtime.

MEASUREMENT

Measurement Object	Power plant in Lichterfelde
Microfone Array	Star48 AC Pro
	Ring48 AC Pro
Software	Noiselmage 4
	Acoustic Photo 2D
	Recorder
	Spectral Photo
	Advanced Algorithms
Data acquisition	Data Recorder mcdRec 721

Measurements were taken at two different times: The first measurements served to identify the cause of the noise. On the basis of the results, measures were taken to combat emissions. In a subsequent second measurement, the effectiveness of the measures as well as any existing emission locations were examined. The Star Array is particularly suitable for measurements from a great distance. For detailed measurements from a short distance, the Ring Array should be used.

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RESULT

During the first measurement with the Star Array in the far field, the surrounding staircase at the chimney can be clearly identified as the main noise source (see Fig. 1). The sound spectrum shows discrete frequencies indicate a whistling of the wind over the grating structure. Using the Acoustic Camera, it was possible to associate these frequencies with different sound sources at the grating structure of the staircase (Fig. 2 left).



Fig. 1 Result of the overview measurement

In order to prevent this flow noise, the customer outfitted the stairs with rubber mats.

Another follow-up measurement shows the success of this measure. Only one sound source in the upper part of the chimney can be found (Fig. 2 right). This remaining sound source comes from the upper staircase, which the customer deemed irrelevant for the acoustic measurements so far. Subsequently, the flow acoustics were also improved here by installing additional rubber mats.



Fig. 2 Before and after comparison. *Left:* before acoustic optimization, *right:* after acoustic optimization.

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