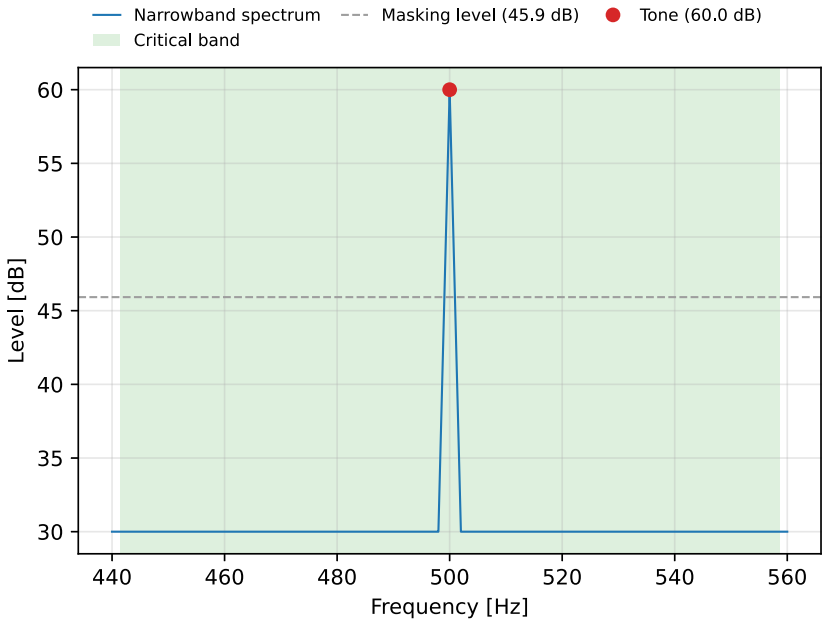
Wind-turbine tonal audibility assessment

IEC 61400-11 tonal audibility of a wind turbine per IEC 61400-11:2012+A1:2018 (subclauses 9.5.2 to 9.5.8); a tone is audible when the tonal audibility ΔL_a exceeds 0 dB.

Source / situation:	Horizontal-axis wind turbine, gearbox tone	Client:	Example client
Measurement position:	Ground board, downwind reference position (example)	Instrumentation:	Class 1 analyser, FFT with 2 Hz lines (Hann window)
Date of test:	2026-07-21		

Critical-band analysis

Tone frequency f [Hz]	500.0
Critical bandwidth [Hz]	117.3
L_{pt} [dB]	60.0
L_{pn} [dB]	45.9
ΔL_{tn} [dB]	14.1
L_a [dB]	–2.3
ΔL_a [dB]	16.4



Tonal audibility ΔL_a = 16.4 dB tone f = 500.0 Hz

Tonality ΔL_{tn} = 14.1 dB ($L_{pt} - L_{pn}$)
Audibility criterion L_a = –2.3 dB
● Decision: tone audible

Result vs requirement: ΔL_a = 16.4 dB, required ≤ 6.0 dB → **FAIL**

The tone is audible (decisive ΔL_a = 16.4 dB > 0): the tonality rises above the audibility criterion (IEC 61400-11:2012+A1:2018, Formulae 33-34).

The tonal audibility $\Delta L_a = \Delta L_{tn} - L_a$ is the amount by which the tonality rises above the audibility criterion (IEC 61400-11:2012+A1:2018, Formulae 33-34); the tonality $\Delta L_{tn} = L_{pt} - L_{pn}$ compares the tone level with the masking-noise level within the critical band about the tone (Formulae 30-32).

Laboratory: Phonometry reference example
Report no.: EXAMPLE-61400-11
Date: 2026-07-21
Operator: phonometry Signature: _____

■ The results relate only to the tested specimen.

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