measnet

INTERNATIONAL NETWORK OF WIND ENERGY MEASUREMENT INSTITUTES

26an01

Acoustic Noise Proficiency Test

Scope and Calendar

Release date: 2026/10/13

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1. Introduction & Methodology

Within the framework of the Measnet network internal quality evaluation program, the collaboration with the IECRE organization and the consideration of proficiency testing as a service offered to its customers, an Acoustic Noise Proficiency Test is to be organized and performed.

1.1. Standards in Scope

The participants shall perform the tasks according to the standard IEC 61400-11:2012 + A1:2018 [1].

1.2. Methodology

According to the IECRE O.D. 551-17 [2], the 26an01 Proficiency Test will be performed in two rounds.

Round 1 is a preparation phase intended to find the sources of differences among the participants and is restricted to type A participants.

Round 2 is open to type A and type B participants. The Pass and Fail Criteria proposed below shall be used by IECRE to determine the proficiency of the laboratories belonging to the system.

1.3. Preliminary Line Choice

No preliminary line choice has been defined for this Acoustic Noise Proficiency Test. However, participants must be aware that a certain line choice may be defined after the first round to be applied in the second round.

1.4. Chunk data definition

In order to trace problems associated with the definition of the normalized wind speed, type A participants must be able to feed into their system a database containing normalized wind speed data, as defined below.

This database shall be used to test the noise-related tasks without taking into account the previous wind-speed-filtering steps.

1.5. Topics and Database

The different tasks of the proficiency test require different data bases. Two sets of comparable data bases shall used for Round 1 and Round 2 of the test. However, in order to trace specific issues, database for Round 1 is segmented into different subsets.

The databases shall be provided by the Technical Coordinator and fulfil the requirements of [2].

Databases to be supplied:

The databases shall include the following subsections or datasets:

Round 1

- Dataset 1: Basic analysis & determination of wind speed. This dataset shall be used to test:
    - Each laboratory shall determine the allowed section of the power curve.
    - Each laboratory shall determine the Kappa factor.
    - Each laboratory shall determine the normalized wind speed.
    - Each laboratory shall determine the sound power lever per bin, including uncertainty.
    - Each laboratory shall calculate the tonal audibility per bin.
- Dataset 2: FFT analysis. This dataset represents the data in a bin and shall be used to test:
    - Each laboratory shall calculate the tonality analysis in each spectrum.
    - Each laboratory shall determine the tonality and audability for the most dominant tone as selected by the conductor of the Proficiency Test.
    - Each laboratory shall calculate the averaging of tonal audability and number of spectra with a tone.
- Dataset 3: Injection of data after determination of normalized wind speed.
    - Each laboratory shall calculate the sound power lever per bin, including uncertainty.

Round 2

- Dataset 4: A full analysis for Round 2. The results of the analysis includes:
    - Each laboratory shall calculate the normalised wind speed.
    - Each laboratory shall calculate the sound power level in 1/3-octaves per bin, including uncertainty.
    - Each laboratory shall calculate the sound power level per bin, including uncertainty.
    - Each laboratory shall calculate the tonal audibility per bin.

2. Pass & Fail Criteria

The following aspects of the Acoustic Noise Proficiency Test will be covered by the second round. Below there is a summary of the aspects and the pass/fail criteria to be applied in the last round:

Three levels of compliance have been defined:

- Green level: The results are considered correct. An analysis is considered in the green level if all the bins are in the green level.
- Yellow level: The results are considered as a possible deviation. An analysis is considered in the yellow level if there is one or more bins in the yellow level but not in the red level.
- Red level: The results are considered as a deviation. An analysis is considered in the red level if there is one or more bins in the red level.

1) Sound power

   - **Standarised wind speed analysis** [m/s array]. For each bin the z-score (deviation from the mean value divided by the standard deviation) of the participant is calculated. A value below 2 is in the green level, a value between 2 and 3 is in the yellow level and a value higher than 3 is in the red level.
   - **Sound power level analysis (corrected)** [dB array]. In each bin a deviation below 0.5 dB is in the green level, a deviation between 0.5 dB and 1 dB is in the yellow level and a value higher than 1 dB is in the red level.
   - **Uncertainty of corrected sound power level analysis** [% array]. For each bin the z-score (deviation from the mean value divided by the standard deviation) of the participant is calculated. A value below 2 is in the green level, a value between 2 and 3 is in the yellow level and a value higher than 3 is in the red level.

2) Tonality evaluation

   - **Audability analysis** [dB array]. For each bin the z-score (deviation from the mean value divided by the standard deviation) of the participant is calculated. A value below 2 is in the green level, a value between 2 and 3 is in the yellow level and a value higher than 3 is in the red level.

If a participant result is in the red zone in any of the analysis, the results are considered as a fail in the Proficiency Test.

If a participant falls in the yellow zone in three or more analysis, the results are considered as fail in the proficiency test.

RETL participants with a “fail” result in the Proficiency Test are entitled to initiate a Correction Phase according to [2].

All results in the yellow level should be explained in a deviation report.

3. Proposed Proficiency Test Calendar

Preparation:

Application period deadline for Round 1	11.01.2027
Election of coordinator & participation appeals (Kick-off meeting)	11.01.2027 to 29.01.2027
Fees payment deadline	29.01.2027

Round 1 (R1):

R1 instructions delivery	01.02.2027
R1 Q&A period	02.02.2027 to 11.02.2027
R1 results submission deadline	25.02.2027
R1 data analysis from conductor	26.02.2027 to 12.03.2027
R1 results discussion	15.03.2027 to 22.03.2027

Round 2 (R2):

Application period deadline for R2	28.02.2027
Fees payment deadline for R2 participants	12.03.2027
R2 instructions delivery	25.03.2027
R2 Q&A period	29.03.2027 to 05.04.2027
R2 results submission deadline	05.05.2027
R2 data analysis by conductor	06.05.2027 to 24.05.2027
R2 results communication & room for non-technical corrections	25.05.2027 to 04.06.2027
R2 participant report creation	07.06.2027 to 25.06.2027

Final public report releasing	Date subjected to IECRE lead assessors' availability for correction plan evaluations

Please note that according to the IECRE procedure, delays can occur if Clarification Sheets are issued during the PT.

4. Results provided by participants

Participants will provide their results in numerical format in designated excel tables for the particular rounds.

The Measnet organization will take care of the data and guarantee that they are treated anonymously, so the PT conductor does not know the results of other participants in advance nor the author of each result sheet.

5. References

[1] IEC 61400-11:2012 + A1:2018, Acoustic noise measurement techniques. Edition 3.1. This edition includes edition 3.0 (2012) and the amendment A1 (2018).

[2] IECRE OD-551-17, Edition 1.0, IECRE, 2020-08-17