

Requirements for Environmental Noise Measurements

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Introduction

To ensure an appropriate and high-quality level of environmental noise measurements and reports, the Danish Ministry of Environment published a Statutory Order (Danish: Bekendtgørelse) [1] in the late 90ties. This included requirements for persons and for noise laboratories conducting environmental noise measurements and predictions. The Statutory Order, which is monitored and conducted by the Danish Environmental Protection Agency (EPA), ensures that certified persons or accredited noise laboratories have the right skills to perform reliable and reproduceable measurements and predictions of environmental noise and vibrations serving as input for the local authority's decision making. The requirements comply with the EU legislation governing the recognition of professional qualifications (Directive 2005/36/EC) and free movement of labour and services across borders (Directive 2006/123/EC).

This paper presents the benefits of such a system from the authority's point of view. It covers the experience with the certification process conducted by FORCE Technology from application, monitoring, reporting to renewal activities.

The EPA's Motivation

It is important for the Danish EPA that decisions determining environmental permit applications and handling noise complaints are based on noise measurements and noise assessment reports of high quality and consistence to ensure that citizens are not exposed to noise levels above the noise limits and to ensure that the conditions imposed on companies' noise abatement are reasonable within a technical and economic framework. [2]

Environmental Noise Management

Originally, the management of environmental noise matters in Denmark was established by the EPA through the appointment of the Reference Laboratory to support local authorities and noise labs on technical matters. Nowadays, the Reference Laboratory is put to tender every 4-5 years. The requirements for noise labs who wants to conduct classified noise reports are either to have an accreditation on environmental noise measurements and predictions or to employ certified persons covering these topics.

The Reference Laboratory

The Reference Laboratory arranges proficiency tests every 18th month for the involved noise labs and certified persons, and it is mandatory for them to participate and pass these tests. Another important task for the Reference Laboratory is to organise the annual *Environmental Noise Day* – an event where people from authorities and noise labs meet to discuss actual and relevant noise matters.

The yearly event has experienced an increasing number of attendees during the last 10-15 years (165 in 2024).

The Reference Laboratory supports the EPA with technical noise matters and administration. Each year, the Reference Laboratory will make a workplan, which is discussed and approved by the Steering Committee. Apart from the proficiency tests and the annual Environmental Noise Day, the work typically covers the following areas:

- Answer technical questions from local authorities and the noise labs
- Maintain the *List of approved laboratories* and a *FAQ* on the website [3]
- Publish supplementary guidelines covering environmental noise issues
- Search and communicate relevant new research results
- Check the instrumentation of noise labs with certified persons (calibration intervals etc.). The accredited labs are checked by the Accreditation Body DANAK
- Provide test examples for software test.

The role and communication flow with the noise labs and authorities is shown in Figure 1. The Steering Committee meets twice a year and the members represent:

- The Danish Environmental Protection Agency
- The Danish Association of Consulting Engineers
- The Local Government Denmark (association of the 98 Danish municipalities)
- Elected Representative of the Certified Persons
- The Reference Laboratory.

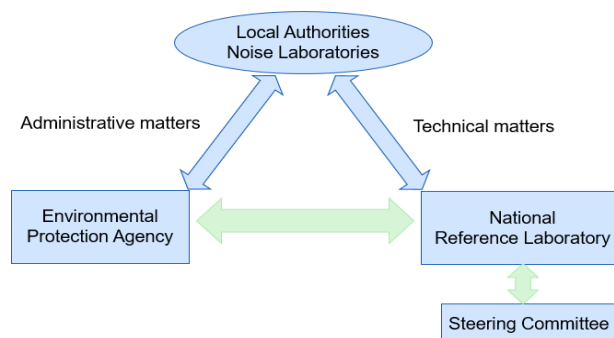


Figure 1: The role of the Reference Laboratory.

Which topics are covered by the environmental noise management legislation?

The environmental noise measurements and predictions are divided into 9 categories, Table 1. There is an important difference between the mandatory and optional topics. The mandatory topics are regulated by the Environmental Protection Act, and the optional topics on road and rail traffic noise are regulated by the National Planning Act.

Table 1: Topics covering environmental noise

Mandatory topics	Optional topics
Industrial environmental noise, including low frequency noise	Environmental vibrations
Noise from shooting ranges	Handguns, noise emission measurements
Noise form racetracks	Railway noise
Wind Turbine Noise	Road noise
	Aircraft Noise

Certification

Certification is one way to qualify for performing approved environmental noise measurements and predictions. The process ensures personal qualifications for measuring, predicting and reporting environmental noise measurements. In addition, a certified person needs access to proper instrumentation, which requires affiliation to a noise lab, that has been approved by the Reference Laboratory.

The applicant must have a relevant education (typically engineer) and at least two years of practical experience with acoustical measurements and predictions. Furthermore, the applicant must have an authorization on company instrumentation (calibration, purchase etc) and proper Danish writing skills.

The applicant must provide 2-3 reports within the scope of the application for the certification body to assess. The assessment is made by two individual assessors (on each report) according to the quality guideline reported by the Reference Laboratory.

A certified person is obliged to make a report of activities on a yearly basis, including activity level, number of reports made and case processing of complaints, if any. The Certification Body will assess sample reports and the result of proficiency tests.

The certificate must be renewed every three years. Renewal is normally done, if the requirements mentioned above are met.

Conclusions

As per 1st January 2025 there are 30 certified persons producing approx.200 approved reports a year on environmental noise. It is assumed, that 29 authorized signatories in the 5 accredited labs on environmental noise produce at least the same number of approved reports.

For the certified persons, the number of sample reports passing the quality assessment, has increased during the years, as indicated in Figure 2.

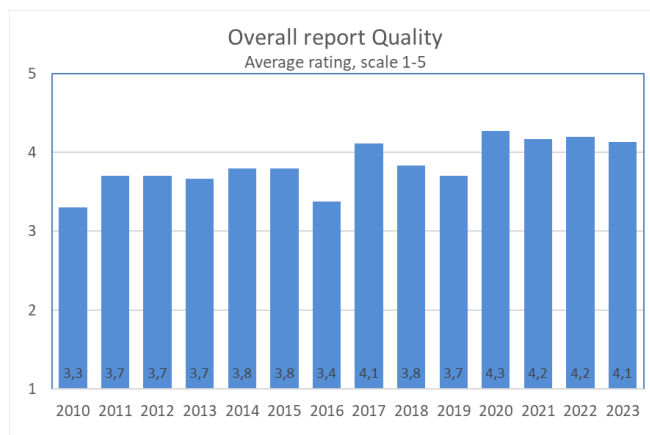


Figure 2: Average quality of sample report assessed by the Certification Body 2010-2023.

Figure 2 also indicates that the requirements laid down in the Statutory Order have set and maintain a high level of credibility of the approved noise laboratories thus ensure the basis for decision-making by environmental authorities.

Literature

- [1] Bekendtgørelse nr 637/1997:” Bekendtgørelse om kvalitetskrav til miljømålinger udført af akkrediterede laboratorier, certificerede personer m.v.”, Danish Ministry of Environment 1997.
Latest version of the statutory order: no. 811 of 19th June 2024:
<https://www.retsinformation.dk/eli/ta/2024/811>
- [2] Danish EPA (english version):
<https://eng.mst.dk/about-the-danish-epa>
- [3] Reference Laboratory web:
www.referencelaboratoriet.dk