IOA WINDFARM GUIDANCE – WHERE TO NEXT

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1 INTRODUCTION

Wind turbine noise assessment has come a long way in the last five years in the United Kingdom, and the completion of an Institute of Acoustics sponsored initiative to produce Good Practice Guidance has done much to codify extant practice. In this paper the history of the production of the Institute of Acoustics (IOA) Good Practice Guide (GPG) and six Supplementary Guidance Notes (SGN) will be reported. The paper will then consider the next steps.

2 BACKGROUND

2.1 Good Practice Guidance

In the UK, noise assessments for wind farm developments are undertaken using the methodology set out in ETSU-R-97 'The Assessment & Rating of Noise from Wind Farms' published in September 1996. The Government Department of Energy and Climate Change (DECC), which has policy responsibility for ETSU-R-97, wrote to the UK Institute of Acoustics (IOA) in Summer 2011 to invite them to produce a 'Good Practice Guide' (GPG). A noise working group was formed (IOA-NWG), and less than two years later in May 2013, 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' was duly published.

2.2 Supplementary Guidance

Following the publication of the GPG, the IOA-NWG continued to produce six Supplementary Guidance Notes (SGN). The purpose of these notes was to provide additional guidance on topics covered in the GPG, along with examples and case studies. The topics covered are listed in Table 1, and are to be read in conjunction with the GPG.

Table 1. Supplementary Guidance Notes

Number	Title	Content
1	Data Collection	Equipment specifications; measurement surveys: Practical considerations and set-up guidance and examples.
2	Data Processing & Derivation of ETSU-R-97 Background Curves	Data filtering, processing and regression analysis for different types of noise environments.
3	Sound Power Level Data	Manufacturer's data and warranties analysis.
4	Wind Shear	Wind speed references and long-term data analysis.
5	Post Completion Measurements	Examples, considerations and strategies.
6	Noise Propagation over Water for On-shore Wind Turbines	Noise propagation for on – shore turbines, or those close to the shore over large bodies of water.

2.3 Amplitude Modulation

The IOA-NWG was not able to find any good practice on the assessment and rating of amplitude modulation (AM) at the time of producing the GPG, and recognised that more research was needed. A recommendation was made to IOA Council to undertake more work on AM, and an AM working group was formed in 2014 as a sub group to the IOA-NWG. Other papers will be presented at this conference covering the activities of the sub group, and the DECC sponsored research to determine an AM penalty scheme.

2.4 SGN Production

In keeping the GPG as concise as possible, a large amount of detail was stripped out from the earlier GPG consultation draft which the IOA-NWG felt was useful information in its own right. It was therefore decided to create a number of notes to contain this information. Following the same procedure as that adopted for the GPG's production, six draft documents were published for consultation in early 2014, and the set of six SGN's were published in Summer 2014. As with the GPG, the SGN's were subject to peer reviews before consultation and before final publication.

The SGN's have been the subject of a minor review over the past year, and the second issue of the SGN's have been recently published. It should be noted that due to misapplication of the guidance in SGN 6, for the time being, SGN 6 is withdrawn, and assessors are referred back to the advice in the GPG covering noise propagation over bodies of water. The IOA will be seeking formal endorsement of the SGN's from the various Government Departments.

The SGN material was first presented as part of the GPG consultation, to which there were over 50 consultation responses. Several of these responses sought to challenge the very basis of the ETSU-R-97 methodology, but this aspect was outside the scope of the IOA-NWG. All of the material submitted in support of these opinions was considered by the IOA-NWG to be based on flawed arguments and anecdotal evidence, and subject to repeated rebuttal at Public Inquiries (part of the UK planning process).

The IOA limited the review to technical aspects to ensure that the guide was limited to scientific evidence on the methodology only. Noise limits for wind farms are set by the Government in the UK, and take account of a number of factors, balancing the impacts of wind farms against the wider climate change agenda. In restricting the scope of the working group, it was possible for the IOA-NWG to gain a consensus view on the methodology. It is unlikely that this could have been achieved had the scope included discussion on the limits – the original ETSU-R-97 working group could not agree on suitable limits, and a compromise was reached based on the knowledge of noise impacts at the time. Subsequent Governments have reviewed the limits and continue to support them, although clarity has been provided that the limits should be seen as exactly that; limits that should not be exceeded. Each scheme should be assessed on its merits, and it is of note that recent decisions on large UK wind farms have been turned down where the schemes were within the limits.

There were substantially fewer responses for the SGN consultation. It was the opinion of the IOA-NWG that no new evidence had emerged on the methodology since the GPG was published, so few changes were made to the SGN's prior to publication. The UK approach is considered to closely follow the approach taken in most other countries where guidance exists.

3 NEXT STEPS

The political landscape has changed significantly since the publication of the GPG, and the current Government has removed the subsidies for on-shore wind, as well as bringing in a community buy-in requirement for future schemes. These changes are widely expected to result in a significant reduction in the number of future schemes coming forward, but are not a blanket ban. Therefore

there is still an ongoing need for the evolution of guidance on wind farm noise assessment, and improvements to the GPG.

Over two years have passed now since the GPG was released, and the feedback received has been very complementary, with only a few issues being reported. Aspects that have been raised include:

1) More good practice examples of cumulative situations would be welcome
2) A refinement to the valley correction is needed
3) More definitive guidance on suitable wind shields
4) An AM planning condition

The only current task for the IOA-NWG will be to review the output of the AM work, and it is expected that following the implementation and testing of a penalty scheme that a SGN covering AM would be produced.

Feedback on all aspects of the GPG and the SGN's are welcome. The IOA will keep the issues under review and will issue updates when significant changes are required. Wind turbine noise will remain a topic of ongoing meetings where it is expected experiences with AM will be the focus of the next meeting.

4 CONCLUSIONS

The IOA has now published its GPG and five SGN's, which are being widely used in practice for wind turbine noise assessment. Work is currently underway by the IOA AM working group to derive a metric to quantify AM. UK Government has commissioned a research project, and the IOA will work closely with the appointed researcher to help develop a rating and penalty scheme to deal with AM.

5 REFERENCES

1. ETSU-R-97 'The Assessment & Rating of Noise from Wind Farms', http://webarchive.nationalarchives.gov.uk/+/http:/www.berr.gov.uk/files/file20433.pdf
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4. Institute of Acoustics 'GPG SGN's 1-5', Institute of Acoustics website: http://www.ioa.org.uk/publications/wind-turbine-noise