Information on the use of WindPRO for calculating noise according to the Swedish noise codes.

For some time there has been some confusion on how to use WindPRO for calculating noise according to the Swedish noise codes. This confusion has lately increased and we therefore send this information letter to explain the current status on noise calculations in WindPRO.

"Ljud från vindkraftverk" describes a model to correct the noise emission value of the turbine with the difference in actual shear compared to the shear of the IEC codes. This correction is supposed to fix the problem that the wind speed in high shear terrain like forest is higher at hub height than in open, low shear terrain when the wind speed at 10 m height is 8 m/s. With a higher wind speed at hub height a higher noise level is expected.

This is where the problem is. "Ljud från vindkraftverk" assumes a linear relationship between noise value and wind speed (the k value). Unfortunately this relationship is not linear! The curve levels out and for some turbines the noise level actually starts dropping at high wind speed. When "Ljud från vindkraftverk" was released we asked Naturvårdsverket how to assess this linear slope but only got the reply that WindPRO would have to do the same as the Excel sheet from Naturvårdsverket (which do not relate to this question)…

The result was great confusion and we choose to freeze the k value to 1. This would in forest terrain give a conservative result, which we after all considered better than an underestimation of the noise. This is a problem for the project developer, but should not be a problem for the planning authorities.

This spring we have been in contact with Naturvårdsverket who are in the process of making a revision to "Ljud från vindkraftverk". When this revision is official we will implement it in WindPRO. We hope for a solution to the k value problem and have indeed considered some possible solutions, but more interestingly Naturvårdsverket intend to accept max noise calculations. This is good news because it entirely avoids the k value problem. In this case the maximum noise value for the turbines is used.

The message we have received is that these calculations are already recognized today. Until it becomes official however it is necessary to trick WindPRO in order to make this calculation. This is done in the following way:

1. Open the wind turbine catalogue and find the turbine you want to use for the calculation
2. Select the Detail tab and make a copy of the noise record you wish to use.
3. Edit your noise record and find the max noise level for the turbine. It is typically the one called 95% or simply the highest noise value. If you have only 8 m/s values then you can contact the wind turbine provider.
4. Insert this noise value in the field for 8 m/s so that WindPRO believes it is taking the 8 m/s noise value when it is actually using the max noise value. Press ok and save your wind turbine data.
5. For the WTG's you now have to select the noise record you have just edited.
6. Start your noise calculation and set the roughness to 1,5. This value means that no model correction is used.

The texts on the noise report will be wrong but the result is correct.

Some time in the autumn WindPRO 2.7 will be released. It will be prepared for the draft that currently exist on the new noise revision, but will probably be locked until the code is official.

Best regards

Thomas Sørensen

EMD International A/S