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I request that the following rationales be included with the suggestions on the summary sheet distributed at the April 2nd meeting. At that meeting there were several points on which there appeared to be confusion about the rationales for the suggestions and it would be helpful if these rationales were explicit at the April 15th meeting.

Rationale for Decommissioning Plan and Security (NHWW & Town of Bridgewater suggestions) p. 6, Site 301.08(2)(7) and (c)(2)

The recommendations pertaining to decommissioning are taken from recent certificates issued by the Vermont Public Service Board in reference to approved wind energy facilities. In all cases, Vermont decommissioning plans were required to be fully funded by the time a project is placed into service . The funds represent the full amount of decommissioning and do not net out the projected salvage value.. The Vermont orders we looked at are as follows:

a) Certificate of Public Good for Kingdom Community Wind:
http://psb.vermont.gov/sites/psb/files/orders/2011/7628FinalOrder%20CPG%20Attachment%20A- 2.pdf

b) Certificate of Public Good for Georgia Mountain Community Wind:
http://psb.vermont.gov/sites/psb/files/orders/2011/7508%20Final%20Order.pdf

c) Certificate of Public Good for Deerfield Wind:
http://www.state.vt.us/psb/orders/2009/files/7250finalorder.pdf

The State of Ohio Power Siting Board (OPSB) has required the full value of wind project decommissioning to be maintained in a decommissioning fund if other third parties held liens on the project. Many wind developers suggest the cost of decommissioning a wind project would be largely covered by the trade-in value of the project's scrap metal and copper. This assertion assumes that market value for scrap metal is relatively high and stable, which is far from the case. The volatility of the scrap copper market is indicative of the difficulty in accurately projecting the actual market value of project components. Further, scrap value estimates are frequently based on quoted scrap values that assume certain scrap specifications. For example, the scrap value quotes assume turbine towers are broken down into pieces less than three-feet in length and that copper would be stripped from the equipment. These are added costs that are typically not accounted for when determining the value of scrap.

The NH Legislature was very clear that decommissioning plans are important to protect the State, aesthetically and financially, following the end of useful life of industrial wind turbines and related infrastructure. Pursuant to RSA 162-H:10-a (II) "For the adoption of rules, pursuant to RSA 541-A, relative to the siting of wind energy systems, the committee shall address the following: (7) Site decommissioning, including sufficient and secure funding, removal of structures, and site restoration." (NHWW)

Rationale for disclosure of Impact Easements, pg. 8, Site 301.14(f)(2)d

STATEMENT OF REASON These Impact Easement agreements need to be disclosed during the SEC process for many reasons, not the least of which are impacts on community health, safety, and real estate and tax valuations. The long-term effects and unintended consequences of these agreements need to be considered. Easements typically run with the land and may be in effect for more than 30 years. The disclosure of an easement is also important in evaluating post-construction impacts for compliance. Recent situations where Impact Easements have exacerbated financial and/or health issues: • Post-construction compliance monitoring

and assessments of impacts could be skewed if there is data pertaining to where impact easements have been put in place. •

Glenmore (Brown County), Wisconsin - Duke Energy's Shirley Wind Farm entered into a number of impact easements with surrounding landowners. When other, non-encumbered residents began to experience negative impacts associated with the project, there was no means by which the governing body could fully assess the degree of impact since those with easement agreements were prohibited from speaking. In October 2014 the Brown County Board of Health ultimately declared the Shirley Wind Farm a "human health hazard" but knowing about the existence of the easement agreements is useful. •

Coos County, New Hampshire - In 2014, there was an issue with property owner tax payments rising significantly due to the county tax assessment of the Granite Reliable wind energy facility. NH's Governor Hassan signed a Bill relieving property owners of a portion of their tax burden, not knowing these property owners had already agreed to a cash settlement with the wind developer protecting them from tax increases. The agreement called for "the strictest confidence". This situation resulted in a multitude consequences for the state and local governments.

Other unintended consequences to consider, which may result from not disclosing these agreements: • Abatements – there is nothing to preclude a property owner that has signed an Impact Agreement to request an abatement on their property taxes, as is the case with a landowner in Lempster, due to noise, shadow flicker or property value impact. Unless disclosed, the town officials are unaware of this Impact Easement. (NHWW)

Rationale for Pastoriza suggestion for VIA, p. 9, site 301.05(b)

Northern Pass's own visual simulations are at distances of up to seven miles, at which existing transmission corridors are clearly visible.

See also my late submission, a photograph of transmission lines from 5 miles.

Rationale for NHWW, Blair, Pastoriza suggestion on page 11, Site 301.08(a)(1) :

1) SB99 Consensus: The SB99 stakeholder group researching energy siting related to health and safety achieved consensus on the proposed Site 301.08(a)(1)(a) on pre-construction noise surveys, predictive modeling and post-construction noise monitoring. The stakeholder group consisted of wind developers, members of the public, and four acousticians with expertise on turbine noise...

2) Noise Standard: Consensus was not achieved on wind turbine sound standard cited in Site 301.14 (f)(2)(a) that recommends a 39 dB(A) not to exceed standard at the property line of a non-participating landowner. Supporting documentation follows:

(a) Limits in Denmark for Wind Turbine Noise: 44 dBA (at 8 m/s) in open areas with few residences (At this level, turbine noise from larger capacity machines will produce significant annoyance at residences due to a low frequency component.) 39 dBA (at 8 m/s) for residential areas

(b) Pedersen and Waye 35 dBA: E. Pedersen, K. P. Waye, "Perception and annoyance due to wind turbine noise – a dose response relationship", J. Acoust. Soc. Am., 116 (6), 3460-3470, 2004. http://www.proj6.turbo.pl/upload/file/263.pdf Wind turbine noise was perceived by about 85% of the respondents even at A-weighted sound pressure levels (SPL) at 35.0–37.5 dB. This could be due to the presence of amplitude modulation in the noise, making it easy to detect and difficult to mask by ambient noise.

(c) Pedersen and Nielsen below 33-38 dBA: E. Pedersen, F. van den Berg, R. Bakker, J. Bouma, "Response to noise from modern windfarms in The Netherlands", J. Acoust. Soc. Am., 126 (2), 634-643, 2009. http://umcg.wewi.eldoc.ub.rug.nl/FILES/root/pubs/2009/JAS0006341/JAS0006341.pdf

(d) Swedish Limit on turbine noise: 35 dBA is used for wind turbines in Sweden for quiet areas.

NOTES: a) There is substantial peer-reviewed research and scientific articles (several cited above) documenting community annoyance from wind turbine noise. Turbine noise is prominent at a-weighted levels above 38 dB. As turbines get larger, there is a shift to low-frequency noise which travels further and is better able to penetrate walls and enter the indoors. The effects of wind turbine noise on human health is believed to be indirect from noise annoyance and sleep disturbance. There is little research on the impact of turbine noise on wildlife. Since wind turbine noise can contain both tonal components, amplitude modulation, impulsiveness and LF-noise it is perceived as more annoying than other typical noises. (NHWW)

Rather than put intervenors who may not have such resources through the expense of hiring expert witnesses to testify on acoustics, these standards should be incorporated into the rules.

Rationale for NHWW shadow flicker submission, p. 14, Site 301.14(f)(2):

1) Mason County, Michigan, USA: substantial shadow flicker impacts at distances up to 6,000 feet. County ordinance limited shadow flicker to 10 hours per year.

Source: Mary Reilly, Mason County Zoning and Building Director, Scottville, MI, mreilly@masoncounty.net, (231) 757-9272 Observed shadow flicker and results following curtailment mitigation (2013) http://www.masoncounty.net/userfiles/filemanager/414/

2) German Standard: A maximum of 8 hours/year actual amounts of shadow flicker nationwide. Astronomical maximum (worse case) of 30 hours per year and 30 minutes per day.

Source: International Review of Policies and Recommendations for Wind Turbine Setbacks from Residences: Setbacks, Noise, Shadow Flicker, and Other Concerns Minnesota Department of Commerce: Energy Facility Permitting; Kathryn M. B. Haugen; Oct. 2011 http://mn.gov/commerce/energyfacilities/documents/International_Review_of_Wind_Policies_and_Recommendations.pdf

3) Danish Standard: Not exceed 10 hours per year on neighboring houses. If the shadow limit is exceeded the wind turbine owner may alternatively be required to shut down the wind turbine in critical periods. Usually, wind turbines can be fitted with meters to detect shadow flicker on a receptor so that the operation can be halted if the sun shines during critical periods.

Source: Danish Law - http://www.windpower.org/en/policy/plannning_and_regulation.html Source: Wind Turbines in Denmark. Danish Energy Agency. November 2009. http://www.ens.dk/sites/ens.dk/files/dokumenter/publikationer/downloads/wind_turbines_in_denmark. pdf

4. Various: Available list of news articles, videos, documents addressing potential impacts of Shadow Flicker. http://www.windaction.org/posts?utf8=%E2%9C%93&topic=Shadow+Flicker&view=list&per=100

b) Shadow flicker modeling generally assumes a maximum impact distance of 10-rotor diameters which for a 100-meter (328 feet) rotor diameter, shadows would be expected to fully dissipate after 3280 feet. This standard may have been appropriate for shorter blades, however, the longer, wider blades on today's machines and different shadow profiles for different blade shapes (manufacturer dependent) have proven inadequate in estimating flicker impacts. Shadow flicker has been recorded up to 6000 feet from a turbine. (NHWW)

Rationale for NHWW setbacks, pg. 15 Site 301.14 (f)(2)c:

Safety setbacks from turbines are established to minimize the risk of property damage or injury resulting from ice throw or component failure. These sources provide supporting information for the proposed setback recommendations cited above.

1) C., Bossanyi E., Seifert H., Assessment of Safety Risks Arising From Wind Turbine Icing

a. Rime icing is elevation dependent;

b. Under icing conditions, a moving turbine rotor is liable to accrete significantly heavier quantities of ice than stationary components;

c. Rotor blade ice can be cast some distance from the turbine if it breaks off a rotating blade; d. Rime ice can form when the turbine is operating and is not shaken off by blade flexing;

e. Rime ice formation appears to occur with symmetry on all turbine blades with the result that no imbalance occurs and the turbine continues to operate.

2) GE Energy, Ice Shedding and Ice Throw – Risk and Mitigation,

Rotating turbine blades may propel ice fragments up to several hundred meters if conditions are right depending on turbine dimensions, rotational speed and many other potential factors.

3) Iberdrola/Groton Wind LLC, Environmental Health and Safety Plan,
http://www.nhsec.nh.gov/projects/2010-01/documents/131011safety_plan.pdf

Ice that has formed on a wind turbine typically sheds as the air temperatures rises [sic]; however, cases have been documented when ice shedding occurred without a temperature rise. Shedding ice may be thrown a significant distance as a result of the rotor spinning or wind blowing the ice fragments. Icing of blades is a significant issue that during "shedding" poses a risk of injury or property damage. Everyone is reminded that at any time when "icing" may potentially occur there is no replacement for using constant vigilance in assessing your surroundings.

4) Will Staats, NHF&G, Testimony before Vermont Committee,

The danger of ice throw cannot be over emphasized. I have often worked near these turbines on our research projects in the winter and witnessed the large divots in the snow where ice has been flung from the turning blades. On one terrifying occasion, my truck was struck by flying ice that, had it hit me or anyone else close by, could have killed or caused serious injury. One operator of a wind installation told me these machines will throw a four hundred pound chunk of ice one thousand feet.

5) Vestas, Mechanical operating and maintenance manual V90-3.0MW turbine,

Do not stay within a radius of 400m (1300 ft) from the turbine unless it is necessary. If you have to inspect an operating turbine from the ground, do not stay under the rotor plane but observe the rotor from the front. Make sure that children do not stay by or play nearby the turbine. If necessary, fence the foundation.

6) Dr. Terry Matilsky, Windmills: Basic Kinematics,
http://xray.rutgers.edu/~matilsky/windmills/throw.html

Simple math describing motion shows that ice or debris from a 100-foot long blade can be thrown nearly 1700 feet from the base of the turbine. Distance is dependent on the length of the blade, the angle of the blade at the time of the incident, the speed of rotation and the vertical distance from the ground.

7) Nordex Energy, Rules of Conduct on, in and around Wind Turbines Turbine Classes
Falling Turbine Parts - In case of a fire in the nacelle or on the rotor, parts may fall off the wind turbine. In case of a fire, nobody is permitted within a radius of 500 m (1640 feet) from the turbine.

8) Volkswind GmbH, Planning your Wind Farm,

Setback at least 1000 meters (3281 feet) from occupied houses

- Outside the boundaries of protected or conservation areas
- Required space per turbine and carne approx. 2.000 square meters

NOTES:
a) Wind turbine safety setback distances that extend onto non-participating properties may risk rendering those properties unsafe for further development. Local building departments could refuse to grant building permits in the setback zone. Homeowner insurance companies may refuse to insure structures within the safety zone.

b) In general, we recommend safety setbacks to be measured up to the property line of non-participating landowners and not to the wall of a permanently occupied building as stated in the draft rules. The classification of 'permanently occupied building' fails to recognize part-time residents or other structures including, but not limited to barns, sheds and pool. This distinction could run counter to the Equal Protection Clause of the 14th amendment of the U.S. Constitution which prohibits states from denying any person within its jurisdiction the equal protection of the laws. Upon challenge, the Courts could strictly scrutinize the law or, in this case, its administration, to determine whether the classification is discriminatory. (NHWW)

Rationale for Pastoriza, McLaren Above-ground Electric Transmission Line Setbacks, p. 16, Site 301.089b)

The Commonwealth of Massachusetts has defined an edge-of-ROW level of 85 mG as a benchmark for comparing different design alternatives. Although a ROW-edge level in excess of this value is not prohibited, it may trigger a more extensive review of alternatives.

New York has a policy that requires transmission lines to be designed, constructed and operated so that magnetic fields at the edges of the ROW will not exceed 200 mG.

Florida limits magnetic fields at the edge of the ROW to 150 mG for transmission lines with voltages of 69 kV through 230 kV. For lines greater than 250 kV, the limit is 200 mG. Doublecircuited 500 kV lines and lines greater than 500 kV may not exceed 250 mG, also at the edge of the ROW.

Wisconsin has not set hard limits on EMF levels but the state has taken the position that the public has a right to know details about EMF levels. The application process requires project proponents to provide the following information:
a) number and type of each building within the following distance categories – as estimated from the centerline: 0-25 feet, 26-50 feet, 51-100 feet, 101-150 feet, and 151-300 feet.

Types of buildings include homes, apartments, schools, daycare centers, hospitals, and commercial/ industrial buildings.

b) detailed magnetic field profiles for each unique structure type or circuit configuration (new and existing) with the exception of dead-end structures adjacent to substations. 16 It's important to note that EMF is directly tied to the amount of current flowing through a line. Lower capacity lines (69 kV) can show high levels of EMF while some 115kV lines may have lower levels of EMF."

Brentwood, Tennessee The city of Brentwood, Tennessee, passed a health and safety ordinance in 1991 that limits the magnetic-field level from transmission lines at the edge of rights-of-way to less than 4 mG and if the level is greater, it needs to be mitigated, although they did not indicate how this should be achieved.15 Unlike the other ordinances and acts, this requires that existing transmission lines be brought into compliance, rather than just new or upgraded transmission lines.

Finland The Finish Radiation Safety Agency recommends that new houses and day care facilities should not be built in a zone on either side of overhead transmission lines where 0.4 μT (4 mG) is continuously exceeded. This is a recommendation only and is not legally binding, although it has been indicated that this zone may actually be in effect in practice.

Netherlands A 2005 policy, which seems not to be binding, recommends that local authorities restrict the building of new homes within a "0.4 μT" zone near power lines. This recommendation was reaffirmed in 2008 and extended to areas of long stay (14-18 hrs per day) and all "sensitive objects" including dwellings, schools, crèches, and house garden paths.

Rationale for Orderly Development effects on Municipalities, (Town of Bridgewater, Frantz, Kudlik, Ruveson, et al suggestions) p. 17, Site 301.09, 301 15

"No town should be forced to be an unwilling host and this would help keep the SEC from being overwhelmed by months of acrimonious testimony and letters to post and file. Article 1 of the New Hampshire state constitution states that "all government of right originates from the people, is founded in consent, and instituted for the general good." Therefore I'd like to remind you that each of the member's of the SEC are required to protect our constitutional rights as Article 8 points out that "all power resid(es) originally in, and derive(s) from, the people" you are "at all times accountable to (us)." It is imperative that... energy projects... be considered in light of Article 28-a: "The state shall not mandate or assign any new, expanded or modified programs or responsibilities to any political subdivision in such a way as to necessitate additional local expenditures by the political subdivision unless such programs or responsibilities are fully funded by the state or unless such programs or responsibilities are approved for funding by a vote of the local legislative body of the political subdivision." Article 28-a clearly gives the SEC the authority to require town votes be attained prior to accepting applications for all energy projects, but most especially for those not needed to keep our own lights on here in New Hampshire." (Cindy Kudlik)

Rationale for Best Practical Measures, (NH Audubon, AMC, Martin, Pastoriza) p. 26, Site 102.08

AMC and Audubon have respected reputations as environmental groups advocating for best compromises between people. industry and the environment, and have here suggested appropriate standards for best practical measures.

Kris Pastoriza