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Kristen N. Edwards, Staff Attorney
SOUTH DAKOTA PUBLIC UTILITIES COMMISSION
Pierre, South Dakota

Re: File 6184-003. • *In re Docket EL19-003, Crowned Ridge Wind LLC Codington & Grant Counties*

Dear Counsel:

I represent Garry Ehlebracht and several other neighbors in the Goodwin area of Deuel County. These persons had intervened in Docket EL19-016, *Crowned Ridge II, LLC, Deuel, Grant and Codington Counties*, now dismissed, and these same persons are petitioners in the writ of certiorari case, entitled *Ehlebracht, et al. vs. Deuel County Board of Adjustment, et al.,* being a challenge to the Special Exception Permit issued in 2018 to Crowned Ridge. This latter case is pending before the Honorable Dawn Elshere, Circuit Judge, and we anticipate Crowned Ridge's re-filed facility permit to replace EL19-016.

Although my clients do not have a direct interest in this particular docket, several recently filed items have caught our attention: (a) the "Rebuttal Testimony of Mark Thompson" (dated May 24, 2019), with "Confidential Exhibit MT-R-1," and including also "Exhibit MT-R-3;" and (b) the "Direct Testimony of Darren Kearney" (dated May 10, 2019), marked "Staff Exhibit S-2" (public version), a compendium running to 675 pages. These items are of interest as they touch on some of the same matters that, we expect, will be litigated before Judge Elshere, and will also be challenged in any future hearing on this applicant's sister entity, Crowned Ridge Wind II, LLC. Thus, we trust the comments in this letter are considered, even though my clients are not parties to the current docket. These comments are narrowly focused on just two points – (1) applicable zoning ordinance setbacks to highways and roads as pertains to the risk of "ice throw," and (2) shadow flicker.

As to Point 1, the underlying zoning ordinances of Grant, Deuel and Codington are somewhat similar in text regarding the setback "distance from public right-of-way," sometimes referenced as "minimum spacing requirements":

County	*Source/Citation*	*Text*
Grant	Zoning Ord. Table 1211-1	500 Feet or 110% of the vertical height of the wind Turbine, whichever is greater ***

*** The horizontal setback shall be measured from the base of the tower to the public right-of-way.

Deuel	Zoning Ord. Sec. 1215.03.2	Distance from the public right-of-way shall be one hundred ten percent (110%) the height of the wind turbines, measured from the ground surface to the tip of the blade when in a fully vertical position.
Codington	Zoning Ord. Table 5.22.03.2	Distance from the Right-of-Way of Public Road – 110% of the height of the wind turbine **

** The horizontal setback shall be measured from the base of the tower to the public right-of-way.

According to the pre-filed testimony of Mark Thompson (dated January 31, 2019), the project in EL19-003 will primarily use GE 2.3MW turbines with 116-meter (381 feet) rotors, at 90-meter (295 feet) hub height. If "vertical height" or "height" under each ordinance is understood as being consistent with the Deuel County definition, then the setback of 110% roughly equates to 534 feet.

In my work as counsel for private parties, I have attempted to follow ordinance changes and developments in both Grant and Deuel Counties, with a lesser emphasis on Codington. Though uncertain of the date of last changes in Codington and Grant, I was involved in Planning Commission hearings in Deuel County in 2016, with amendments being adopted in early 2017. This is of some consequence in that at *no* time – to the best of my knowledge – did the proponents of ordinance changes, or those resisting such changes, bring to the attention of the Planning Commission any of the documents written by General Electric that have just now come to light in EL19-003. Likewise, to the best of my knowledge and information (based on review or inquiry), at *no* time did the applicant (Crowned Ridge Wind, LLC or Crowned Ridge Wind II, LLC) bring to the attention of the applicable Board of Adjustment in these three counties any of the General Electric documents concerning "ice throw" or those described as a "safety manual."

Parties and their counsel, in coming before the courts or administrative agencies of this state, owe a duty of candor to the fact-finder. I will return to this thought after further discussion of Point 1.

With immediate focus on the Rebuttal Testimony of Mark Thompson (May 24, 2019), it appears he has now provided (as Confidential Exhibit MT-R-1) a certain GE safety manual. Whether this is the same GE "safety manual" that runs to 64 pages, with a copyright date of 2015, is not known to this writer, but that document – in my hands – is labeled (on the cover) as "Technical Documentation Wind Turbine Generator Systems 1&2MW Platform" – with the secondary title of "Safety Manual," while imploring "Please read first." Each page carries the warning of "CONFIDENTIAL – Proprietary Information. DO NOT COPY without written consent from General Electric Company. UNCONTROLLED when printed or transmitted electronically."

Again, to the best of my knowledge and information, this Safety Manual – while apparently now in the hands of PUC staff – has never before reached the hands of a Planning Commission or a Board of Adjustment in the Counties of Codington, Deuel or Grant. Whether the document has ever reached the desk of First District in Watertown, the staff of which has historically offered guidance and writing assistance to these counties, is unknown. If anyone can prove otherwise, I will stand corrected and widely publish that correction.

At pages 44-45, the Safety Manual (the one in my possession) has this to say:

8.4.1 Ice Build-up on the Rotor Blades

Ice build-up on wind turbine generator systems (WTG) and, in particular, the shedding of ice from rotor blades can lead to problems if wind turbine generator systems are planned in the vicinity of roads, car parks or buildings at locations with an increased risk of freezing conditions, unless suitable safety measures are taken.

If people or objects near the wind turbine generator system (within the distance **R***) could be endangered by pieces of ice thrown off during operation, GE Energy always recommends the use of an ice detector.

The ice detector is installed on the nacelle. It is possible to detect the build-up of a small amount of ice by means of the ice detector. If this is the case, the ice detector sends a signal to the turbine controller. The turbine controller disconnects the wind turbine generator system from the grid and the rotor is brought to a standstill or rotates at a very low speed. A message about the icy condition is displayed on the monitor in the turbine. In addition, a message is sent to the service station and the operator via modem. The turbine does not restart until the detector is free of ice or the operator has satisfied himself of the ice-free condition of the rotor blades, has acknowledged the ice alarm message and restarts the plant.

However, ice may form on the rotor blades considerably more quickly than on the ice sensor on the nacelle. **As a result, there is a residual risk for the reliable detection of ice build-up on the rotor blades. (Emphasis supplied.)**

The detector on the nacelle must be set relatively sensitively, in order to ensure that the time from when the ice starts to build up on the rotor blades until the detector sends a message about the build-up of ice is as short as possible. As a consequence, a certain number of spurious trippings cannot be excluded. Loss of energy yield may occur as a result of the spurious trippings.

If an ice detector is not used, it is advisable to cordon off an area around the wind turbine generator system with the radius **R*** during freezing weather conditions, in order to ensure that individuals are not endangered by pieces of ice thrown off during operation (cf. also section 11.1).

* **R** = 1.5 x (hub height [m] + rotor diameter [m])
Recommendations of the German Wind Energy Institute DEWI 11/1999)

The Safety Manual's formula suggests a setback of 1,014 feet, more or less, when proposing GE turbines of the size mentioned by Mr. Thompson.

One of the unnamed intervenors in this case (not having read all of the Intervenors' submissions, this particular person remains unknown to this writer), according to Mr. Kearney's testimony (at 17-18), has suggested the right-of-way setback should be 1,014 feet based on a certain GE document, number GER4262, "Ice Shedding and Ice Throw - Risk and Mitigation." According to Kearney, the intervenor did not provide a copy of the publication (dated April 2006), and thus, PUC staff "has not reviewed this specific technical document since a copy was not provided by intervenors." That said, I must assume the Applicant also did not provide a copy to staff. My copy provides, in part: "[R]otating turbine blades may propel ice fragments some distance – up to several hundred meters if conditions are right." It otherwise uses the same formula provided in the Safety Manual, quoted previously.

Document GER4262 further provides that if icing occurs, personnel should proceed with deactivation of the turbine. As of April 2006, one might assume the sophistication of an "ice detector" system might not be quite as good as exist presently; but, even with that assumption (since there is nothing in the record to support that generous assumption), this quote is telling:

> [T]here are several scenarios which could lead to an automatic shutdown of the turbine:
>
> - Detection of ice by a nacelle-mounted ice sensor which is available for some models (with current sensor technology, ice detection is not highly reliable)
>
> - Detection of rotor imbalance caused by blade ice formation by a shaft vibration sensor; note, however, that it is possible for ice to build in a symmetric manner on all blades and not trigger the sensor
>
> - Anenometer icing that leads to a measured wind speed below cut-in

Document GER4262, according to the apparent publication date, has been around for more than a dozen years, and yet, I've never seen it submitted by an candid applicant in any South Dakota county proceeding for a conditional use (or similar) zoning permit. Does anyone recall seeing this document submitted to County's board of adjustment (or the planning commission, when writing the ordinance)? Apparently, GER4262 also has never been submitted in a PUC siting permit application, such as the one at hand; otherwise, Commission staff would have had some familiarity with these provisions.

Witness Mark Thompson seems quite familiar with GER4262, as his rebuttal testimony (at unnumbered page 4, at line 10) is an effort to discredit that particular GE document as "based on older studies of smaller wind turbines." Thompson then proceeds to speak about GE's current setback recommendation, one claimed to be based on more recent studies on ice throw from larger utility scale wind turbines (*Id.*, at line 12). Before getting to the new GE document, however, I would note that the source and origin of GE's recommendations, as described by Thompson, are not stated in GE's newer document itself. The new GE document speaks without ever mentioning the prior inconsistent writings, and also does little to support Thompson's testimony of how or why it was written, published or distributed.

Exhibit MT-R-3 has a copyright date of 2018, and does indeed assert (in Table 1) that for reason of blade failure or ice throw, a recommended setback distance to public roads of merely 1.1 x tip height, meaning hub height plus ½ rotor diameter. Nowhere in this new document is *any* disclosure of how this new recommendation was fashioned, or *why* this recommendation – as opposed to that in GER4262, or even the Safety Manual (the version in my hands, if not that provided to PUC staff), dated 2015 – is now *the* controlling document. Thompson closes with the claim that Crowned Ridge Wind will "comply with the most current GE set back." (*Id.*, at line 14.)

Thompson also makes much ado about the claim that Crowned Ridge Wind (in Exhibit MT-R-2), and his narrative at unnumbered page 3, has "committed to use an ice detector and ice detection system on all CRW turbines, which will shut down the wind turbine if the ice buildup is at a level that causes the turbine output to be outside expected limits set by GE." I don't understand much of what Thompson says in this passage – but it is most interesting to note – *if* the 2018 document is the correct, governing recommendation as to the theoretical range of "ice throw," why would Crowned Ridge Wind even bother to trot out the use of these ice detectors? Is it to placate Commission staff? All of the turbines will be sited at least 110% (minimum) from roads, as that is what the several ordinances require. Is this setback not fully consistent with this latest prognostication from General Electric? (Of course, it would have been more believable if GE had sought to explain – even a tiny bit – why this latest writing represents reliable truth, as opposed to the earlier and even other recent writings.)

I would add this observation about MT-R-3 (being the 2018 "update" to GE's recommendations, without ever bothering to mention the prior published formula). Unlike the two earlier writings, it says *nothing* whatsoever about the suggested deployment of "ice detection systems." It also neither expands upon nor retracts the earlier writing that suggests these *detection systems are not very reliable*. So, as I see it, we have an Applicant readily agreeing to use an ice detection system on these turbines (for which there is a residual risk, as stated in the 2006 document, while the latest – 2018 – doesn't bother to even mention these devices), even though the latest-and-greatest writing from the manufacturer claims the ice throw will never even reach the road, assuming it is located at least 110% of "height" or "vertical height," each of which seemingly equates to the "tip height" as used in the 2018 GE document. Is this new document credible, since it does nothing to explain away what was written in either 2015 (safety manual), or the 2006 publication (GER4262)? Asking the question suggests the answer.

Is this Applicant – in readily accepting the most recent GE recommendation – being credible in such eagerness, after having failed to disclose (I fully believe) the manufacturer's earlier writings, with more stringent recommendations, within the prior county land-use proceedings – those matters where candor counts for much? When the setbacks of each ordinance were being debated and fashioned in Watertown, Clear Lake and Milbank, did NextEra – then in possession of the 2006 and 2015 GE documents, both calling for a setback of about 1,014 feet, when proposing a turbine of these dimensions - urge that the ordinances could just as well be even more generous for the safety concerns of the traveling public, since based on those publications, placing a 485' turbine (with 381' rotor), say, a mere 600 or 700 feet from the road would be risky

business? *I don't recall that ever happening, nor have I ever read of it happening.* Yet, a number of the proposed turbine sites are in that range of distance from the road, it appears to this writer.

Candor and credibility are precious commodities, easily lost and squandered. Such is the case here on the matter of setbacks from roads; and if that point remains questionable, then as to what subjects does it remain intact? Seizing upon the 2018 document as justification for short setbacks, while withholding and not disclosing the prior musings of General Electric as to what was then deemed appropriate (as evidenced by the 2006 and 2015 "safety manual"), means Applicant has "sold" each of these counties on a rather reckless business scheme. We fully expect to bring these (and other) points to the attention of Judge Elshere and, meanwhile, all others charged with protecting the interests and safety of the public (such as this Commission). Is this Commission's staff entirely confident that Applicant has candidly provided credible information (from General Electric itself) bearing on the suitability of ordinance-based setbacks to roads and highways in these counties – or as to the efficacy of those detection devices that GE itself has termed "not highly reliable" (GER4262, as quoted on p. 4, above)?

Now, and briefly, to Point 2: Both Staff Witness Kearney and Applicant Witness Thompson have provided extended written discussions of "shadow flicker." The former witness, at p. 11, affirms he is "comfortable with [a] limit" of 30 hours of "shadow flicker" per year, and goes on to say this is consistent with permit conditions in other projects and the ordinances in Codington and Grant Counties (actually, the latter ordinance says nothing about shadow flicker, to the best of this writer's knowledge). The fact is – the 30 hours per year limit – is grounded *nowhere* in law sufficient to trump the rights of the fee owner, and if imposed or allowed, it represents a taking of land rights exclusive to the fee owner, absent some easement, lease, privilege or servitude negotiated between this Applicant and that owner.

The owner of land in South Dakota has the right to possess and enjoy his or her estate to the exclusion of *all* others, and that includes any purported right or claim of this Applicant – and without regard to how many siting permits or Conditional Use Permits it can muster and have in hand, each purporting to authorize such privileges – for dumping or disposing of flickering shadows upon the lands of my clients. I imagine that there are many non-participating landowners, within or near the boundaries of this wind farm project in Codington and Grant Counties, who feel likewise. Clearly, Crowned Ridge Wind intends to simply demand, and then take, whatever has not been given to it by means of volitional agreements with landowners; that it may hereafter hold a siting permit from this Commission, ostensibly conferring the right to take the rights of landowners not in privity with Crowned Ridge Wind, adds nothing to the merits of such a naked claim. Debating whether this unwelcome use of land is harmful to the health of occupants, or in line with prior Commission orders, or the underlying land use ordinance of a given county, is all pointless. This adverse taking is an affront to the rights and privileges reserved to the owner.

This letter is intended only to address Point 1 and Point 2, as have been framed at the outset. This is the takeaway as to Point 1 - Crowned Ridge Wind hopes to persuade Commission staff as to this highly improbable (in this writer's estimation) claim: "The bigger they are, the shorter the ice throw." (Conversely, we suppose, the "shorter they are, the longer the ice throw" – think about that for a bit.) But this assertion seems rather doubtful in light of GE's earlier writings, even while the 2018 document makes no serious effort to explain *why* the laws of physics (as

dimly understood by this writer) are modified in deploying "larger utility scale turbines" (as quoted on p. 4, above). As the ice throw range of these bigger turbines is assuredly confined to the formula stated in the 2018 document – as Crowned Ridge claims - then would not the "ice detectors" (that technology which the prior GE documents also clearly disparage) be wholly unnecessary (as Applicant yet proposes per Exhibit MT-R-2)? It is interesting also that the 2018 document makes no claim of any asserted improvements in this detection technology. I have little doubt but that Crowned Ridge *hopes* to persuade Commission staff that the 2018 GE document is (at last, unlike those earlier writings!) an entirely accurate statement of fact, but its actions in agreeing to supply these "ice detection systems" would suggest otherwise. (Is this not the same system that GE itself admits are hardly foolproof?)

Again, as to Point 2, Crowned Ridge Wind, due to an acute case of spatial cramps (arising from the proposed placement of too many turbines and much too close to properties, the owners of which have not otherwise consented to the intrusion) will need to dispose of or dump "shadow flicker" upon the nearby properties and residences of adjoining property owners. Much is written about how this dumping or display must not exceed 30 hours per year. What is not being said (or admitted) is that Applicant – having entered into no contract or agreement towards that end – has no right to demand that this burden be inflicted upon adjoining owners. Also unstated is that this Commission has no actual legal authority to take and bestow that use and benefit upon Applicant, to the detriment of the owners. Claiming that the Emperor's new clothes are magnificent, having colors so vibrant, does nothing to change the reality that he is also quite naked.

Thank you for the opportunity to express these views to the Commission, its staff, and all other persons interested in this siting permit.

Very truly yours,
ARVID J. SWANSON P.C.

A.J. Swanson

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BEFORE THE PUBLIC UTILITIES COMMISSION
STATE OF SOUTH DAKOTA

In the Matter of the Application by CROWNED RIDGE WIND, LLC *for a Permit of a Wind Energy Facility in Grant and Codington Counties*	))))	Docket EL19-003

CERTIFICATE OF SERVICE

A true copy of Letter, dated June 6, 2019, addressed to Kristen N. Edwards, Staff Attorney, South Dakota Public Utilities Commission (scan only), seven (7) pages in length, having been submitted on behalf of Garry Ehlebracht, and others, and transmitted (the date below) by undersigned, as counsel for said persons upon the following now appearing on the Commission's Service List in this matter:

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Dated at Canton, South Dakota, this 6th day of June 2019.

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