

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Docket No. 7250

Amended Petition of Deerfield Wind, LLC, for a certificate of public good authorizing it to construct and operate a 15-turbine, 30 MW wind generation facility, and associated transmission and interconnection facilities, on approximately 80 acres in the Green Mountain National Forest, located in Searsburg and Readsboro, Vermont, with 7 turbines to be placed on the east side of Route 8 on the same ridgeline as the existing GMP Searsburg wind facility (Eastern Project Area), and 8 turbines along the ridgeline to the west of Route 8 in the northwesterly orientation (Western Project Area)	
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Order entered: 11/30/2017

ORDER RE: SHADOW FLICKER PROTOCOL

I. INTRODUCTION

This case pertains to the amended certificate of public good (“Amended CPG”) issued by the Vermont Public Utility Commission (“Commission”) to Deerfield Wind, LLC (“Deerfield”) on July 17, 2009, for construction and operation of a 30 MW wind electric generation facility located in Searsburg and Readsboro, Vermont (the “Project”).

In this order the Commission approves the shadow flicker protocol (the “Protocol”) filed by Deerfield provided that Deerfield makes several revisions to the Protocol and files a final copy with the Commission and the parties. Deerfield shall file a revised Protocol consistent with its November 2, 2017, proposal that incorporates the additional revisions required herein.

II. RELEVANT PROCEDURAL HISTORY

On July 17, 2009, the Commission issued the Amended CPG for the Project.

On June 1, 2015, Deerfield filed its second set of post-CPG compliance filings that included, among other things, a revised shadow flicker analysis that accounted for post-CPG modifications to the site plans and the turbine models to be used.

On June 3, 2015, the Commission established a deadline for the parties to file comments on the second set of compliance filings by June 22, 2015.

On June 30, 2015, the Vermont Department of Public Service (“Department”) filed comments on the second set of compliance filings stating that it had no comments on the final design plans.

On July 1, 2015, the Windaction Group filed comments on the second set of compliance filings pertaining to aesthetics and Project-related sound levels. The Windaction Group comments did not specifically pertain to shadow flicker.

On September 24, 2015, the Windaction Group filed supplemental comments on the second set of compliance filings pertaining to Project-related sound levels.

On January 8, 2016, the Commission issued an order approving certain of Deerfield’s compliance filings that addressed the effect of post-CPG Project changes on the shadow flicker analysis.

On August 31, 2017, Deerfield filed the Protocol in accordance with Condition 39 of the Amended CPG.

On September 14, 2017, the Commission established a deadline for the parties to file comments on the Protocol by September 27, 2017, and for Deerfield to file reply comments by October 11, 2017.

On September 27, 2017, the Department filed comments and the Windaction Group and Tom Shea filed joint comments (the “Joint Comments”).

On October 11, 2017, Deerfield filed reply comments and a revised Protocol addressing some of the comments raised by the parties.

On October 20, 2017, the Windaction Group and Tom Shea filed supplemental Joint Comments in response to Deerfield’s October 11 response to comments.

On October 25, 2017, the Department filed comments in response to Deerfield’s October 11 response to comments.

On November 2, 2017, Deerfield filed a revised Protocol that addresses some of the parties' concerns.

III. SUMMARY OF COMMENTS

Department

The Department recommends that Deerfield be required to establish whether any changes in circumstances since the Amended CPG was issued in 2009 may have affected the shadow flicker analysis for the Project. If so, the Department recommends that Deerfield be required to prepare a new shadow flicker analysis.

The Department also recommends revisions to the Protocol -- e.g., that it be revised to (a) specify that the Protocol will be implemented immediately upon the commencement of Project operations, not delayed until after one full year of operation; (b) provide details about how any complaints will be evaluated, what "further investigations" in response to complaints would consist of, and whether the Commission or the parties would have an opportunity to review the scope of any such investigations; (c) require that Deerfield file a mitigation plan with the Commission when informal resolution is reached with a complainant; (d) reference Deerfield's commitment to comply with the Department's complaint protocol for any Department-launched investigation; and (e) agree to conduct more than one shadow flicker investigation at a single residence if circumstances warrant further investigation (e.g., a change in ownership or conditions).

Joint Comments

The Joint Comments state that the "no vegetation assumed" (exh. DFLD-JZ-31a) scenario is not representative of the actual operating environment and should not be used for determining CPG compliance. The Joint Comments also state that the Project has undergone changes since the shadow flicker exhibit referred to in the Amended CPG was developed and therefore the shadow flicker analysis should be updated.

The Joint Comments pertaining specifically to the Protocol rely on the assumption that the vegetation-assumed scenario (exh. DFLD-JZ-31b) is the appropriate scenario to use for

compliance purposes, and contend that under that scenario, most nearby properties would experience zero hours of shadow flicker per year. The comments include the following recommendations for revisions to the Protocol that are based on that assumption: (a) for most nearby residences, if the property owner experiences shadow flicker at all, it would be a violation of the Amended CPG and would warrant an “immediate” response from Deerfield (elsewhere in the Joint Comments, a 24-hour response time is recommended); (b) property owners should be encouraged to video-record occurrences of shadow flicker, but only need to record the duration if their property was modeled to experience more than 0 hours per year. The second round of Joint Comments state that Deerfield should be required to identify the amount of shadow flicker predicted to occur at nearby residences so that Condition 39 of the Amended CPG can be reasonably enforced.

The Joint Comments state that meteorological conditions can change year to year and that the Protocol should not limit shadow flicker investigations to one per residence.

The Joint Comments also state that implementation of the Protocol should not be delayed until after the first full year of operation, and that the Protocol is unclear on how any complaints will be provided to Deerfield, given that the Protocol requires that a complaint contact number be provided to the Commission, the Department, and the town clerks.

The second round of comments filed by the Joint Commenters refers to a commercial shadow flicker detection system that “can determine when shadow flicker will occur at nearby properties and curtail turbine rotation until the shadow moves away.”¹

Deerfield’s Response to Comments

In response to comments, Deerfield filed an updated shadow flicker analysis with a vegetation-assumed scenario and a no-vegetation scenario, consistent with Exhibits DFLD-JZ-31a and b. Deerfield also filed a table that lists the predicted duration (in hours per year) of shadow flicker at nearby residences under both scenarios.

In regard to the one-year delay in implementing the Protocol, Deerfield argues that exhibit DFLD-JZ-31 estimates shadow flicker on the basis of total hours per year, and therefore a year’s worth of operation would be needed before a complaint should be filed. Deerfield does

¹ Joint Comments dated October 20, 2017, at 2.

not object to having the Protocol take effect on commencement of operations, but comments that it will be difficult to assess whether there is non-compliance based on a singular occurrence of shadow flicker at a residence.

In regard to how shadow flicker complaints will be investigated, Deerfield states that it is not aware of an industry standard method or device for monitoring shadow flicker. Deerfield argues that the Siemens product referred to in the Joint Comments is not a shadow flicker monitoring system, but a predictive model included in a computerized facility management system.

Deerfield objects to being required to conduct video recording at complainants' properties, and agrees with the Joint Comments' recommendation that complainants be encouraged to video-record occurrences of shadow flicker at their property. Deerfield's revised Protocol states that "complainants shall be requested to video-record the occurrence of shadow flicker within their home." The revision does not state "within and outside their home," as recommended in the Joint Comments and as agreed to by Deerfield in its response to comments.

In response to comments, Deerfield revised the Protocol to state that Deerfield will not be required to perform a shadow flicker investigation at any residence where it previously performed such an investigation "*in response to a complaint from the same occupant, if Deerfield can demonstrate that there has been no material change in circumstance warranting an additional investigation.*"²

In regard to the recommendation that the no-vegetation-assumed scenario not be used for compliance purposes, Deerfield argues that the parties are collaterally estopped from raising issues that could have been raised in earlier litigation. The exhibit referenced in Condition 39 of the Amended CPG includes vegetation-assumed and no-vegetation-assumed scenarios. The parties have had previous opportunities to litigate this issue and chose not to. Deerfield also argues that deciduous trees lack leaves for more than half the year, and the no-vegetation-assumed scenario "accounts for the fact that there will be times when vegetation may not block (or fully block) shadow flicker from occurring at a particular location."³

² Italics denote revisions to the Protocol.

³ Deerfield letter dated October 11, 2017, at 5.

In regard to contact information, Deerfield replies that its intention is to provide the contact number to the town clerks so that they can give the number out to area residents if needed. In regard to complaint response times, Deerfield believes that three business days is a reasonable time to respond to complainants, and that a 24-hour response requirement would be unreasonable given standard work schedules, public holidays, and other normal business constraints.

IV. DISCUSSION AND CONCLUSION

Deerfield has revised the Protocol to address some of the comments received. Outstanding issues are discussed below. For context in discussing these issues, Condition 39 of the Amended CPG states:

Shadow flicker from the Project shall be limited to the amount specified in exhibit DFLD-JZ-31. Deerfield shall file a protocol that it will implement in the event complaints are received that the Project is exceeding the allowable amount of shadow flicker (including, if appropriate, monitoring at the affected locations).

Revised Shadow Flicker Analysis

Deerfield had previously filed a revised shadow flicker analysis to account for post-CPG changes reflected in the revised design plans.⁴ In response to the Department's recommendation and the Joint Comments, Deerfield filed a subsequent shadow flicker analysis.⁵ The updated analysis accounts for the final configuration and model of turbines, addresses and coordinates for surrounding residences based on a 2017 E911 dataset, 2011 elevation contour and landcover data, Project-related construction clearing, and updated meteorology and cloud cover data (hourly data for Bennington from 1998 through September 30, 2017). Results indicate an increase in shadow flicker in close proximity to the turbines and no measurable increase in shadow flicker in surrounding residential areas.⁶

⁴ Deerfield's second set of post-CPG compliance filings, dated 6/1/2015, at attachment 13.

⁵ Deerfield letter dated November 2, 2017, at attachment VERA Renewables memorandum dated November 1, 2017, Exhibits A and B.

⁶ Based on a comparison of the revised shadow flicker maps to both earlier versions of the maps, it appears that the revised maps show a decrease in the predicted extent of shadow flicker effects in some locations along Route 9.

The revised model outputs are accompanied by a table of predicted shadow flicker hours per year at surrounding residences, labeled Exhibit C.⁷ The table, Exhibit C, eliminates any uncertainties inherent in trying to interpret predicted shadow flicker duration at individual residences based on the shaded areas depicted on the maps. Because the maps represent the most current conditions available, and were requested by the parties, they will replace exhibit DFLD-JZ-31 referred to in Condition 39 of the Amended CPG. The figures (“Exhibits A and B”) and the table (“Exhibit C”) will be used for determining compliance with the Protocol and should be included in the Protocol.

Revisions to Protocol

We disagree with Deerfield’s contention that a full year of operation is required to determine if there is non-compliance with Condition 39. A single location may experience Project-related shadow flicker that exceeds the modeled duration of shadow flicker over a shorter timeframe than a full year. Deerfield has revised its Protocol to state that implementation will commence when the Project commences operation, which addresses this concern.

We agree with the recommendations of the parties, agreed to by Deerfield, that complainants be encouraged to video-record occurrences of shadow flicker, as well as to record the information already in the Protocol (location, times, dates, duration, and weather). In its response to comments, Deerfield agreed to modify the Protocol to encourage complainants to video-record occurrences of shadow flicker “both within and outside the home.” In making this revision at Item 2 in the Protocol, Deerfield omitted “and outside.” Deerfield is directed to revise Item 2 to state, “Complainants shall be requested to video-record the occurrence of shadow flicker within *and outside* their home *as necessary to document the locations where shadow flicker is occurring that the complainant deems problematic.*”

Deerfield is directed to modify its Protocol to include providing contact information for shadow flicker complaints to all the residences listed in Exhibit C of the revised shadow flicker analysis, in addition to providing the information to the entities indicated in Item 1 of the Protocol. Deerfield should provide contact information for complaints to be made by telephone

⁷ Deerfield letter dated November 2, 2017, at attachment VERA Renewables memorandum dated November 1, 2017, Exhibit C.

or in writing. Deerfield is directed to revise Item 1 in the Protocol to state, “Deerfield shall provide to the Department of Public Service, the Public Utility Commission, the town clerks of the towns of Searsburg and Readsboro, *and the residents listed in the attached table labeled “Exhibit C” the contact information that complainants can use to notify Deerfield of a shadow flicker complaint. Complainants should be provided a telephone number as well as an address to file a written complaint.*”

We determine that three business days is a reasonable response time for Deerfield to acknowledge receipt of shadow flicker complaints as specified in Item 2 in the Protocol.

The Department and the Joint Comments recommend that the Protocol provide details about how complaints will be compared to exhibit DFLD-JZ-31. The order for the Amended CPG indicates that the Commission was aware of the fact that there was a basis for considering the model results with and without vegetation assumed.⁸ However, Condition 39 of the Amended CPG does not specify how exhibits DFLD-JZ-31a and b would be used to determine if a shadow flicker violation has occurred. Thus we disagree with Deerfield that Condition 39 fully resolves the shadow flicker compliance issue. We are not modifying the condition, but providing guidance to resolve some of the ambiguities in the use of the analyses.

Exhibit DFLD-JZ-31b provides an indication of residences that may experience shadow flicker during leaf-on conditions. Exhibit DFLD-JZ-31a provides a likely worst-case scenario for occurrence of shadow flicker during leaf-off conditions. This should be considered “worst case” because even in leaf-off conditions, tree branches and evergreens could still provide some degree of screening and many residences would experience less shadow flicker than predicted by the no-vegetation scenario. A case-by-case approach to evaluating complaints will allow for consideration of the time of year the shadow flicker is occurring, and the nature and extent of the vegetation located between the Project and the complainant’s location.

The revised shadow flicker maps entitled Exhibits A and B depict predicted Project-related shadow flicker using the most current information available, at the request of the parties. Therefore, these two maps will be used to replace exhibit DFLD-JZ-31 referenced in the Amended CPG, and should also be included in the Protocol. The table of predicted shadow flicker occurrence at nearby residences under both scenarios, labeled “Exhibit C,” which was

⁸ Order of 7/17/2009 at 12 paragraph 2.

filed with the revised shadow flicker analysis, provides a basis for evaluating the occurrence and duration of shadow flicker at specific locations. Therefore, the table shall be added to the Protocol as an attachment.

Deerfield is directed to add the following to Item 3: *“Deerfield’s recommendation to the Commission regarding whether a violation of the Amended CPG has occurred will include an analysis of the predicted shadow flicker limits for the complainant location as listed in the table labeled “Exhibit C,” or in the figures labeled Exhibits A and B if at a location not included in the table, the time(s) of year when the shadow flicker was observed, and best available information regarding the elevations and landcover types located between the Project and the complainant location.”*

The need for further investigation and how such investigations will be conducted will be determined in the same way that any complaint regarding an alleged CPG violation is handled, which depends on the nature of the specific alleged violation. If the Commission opens an investigation as a result of a shadow flicker complaint, the complainant would automatically be a party to the proceeding, and the other parties would be provided the opportunity to file a motion to intervene.

In conclusion, Deerfield is ordered to make the revisions to the Protocol directed above and to file the final, revised Protocol with the Commission and the parties by no later than December 14, 2017.

The revised shadow flicker analyses filed by Deerfield as part of its November 2, 2017, compliance filings, specifically VERA Renewables memorandum dated November 1, 2017, at Attachments A and B, shall replace exhibits DFLD-JZ-31a and b referenced in Condition 39 of the Amended CPG.

SO ORDERED.

Dated at Montpelier, Vermont, this 30th day of November, 2017.

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	)	PUBLIC UTILITY
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Margaret Cheney	)	COMMISSION
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Sarah Hofmann	)	OF VERMONT

OFFICE OF THE CLERK

Filed: November 30, 2017

Attest: Judith C. Whitney
Clerk of the Commission

Notice to Readers: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Commission (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: puc.clerk@vermont.gov)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Commission within thirty days. Appeal will not stay the effect of this Order, absent further order by this Commission or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Commission within ten days of the date of this decision and Order.