

**STATE OF MAINE
PUBLIC UTILITIES COMMISSION**

CENTRAL MAINE POWER COMPANY

Request for Approval of Certificate of Public Convenience and Necessity for the New England Clean Energy Connect Transmission Project Consisting of a 1,200 MW HVDC Transmission Line from Québec-Maine Border to Lewiston (NECEC) and Related Network Upgrades

Docket No. 2017-00232

REPLY BRIEF OF DOT KELLY

Date: February 13, 2019

Pursuant to the Hearing Officers' February 6, 2019 Procedure Order, Dot Kelly respectfully submits this Reply Brief in the above-captioned Proceeding.

Summary and Introduction:

This reply brief updates some sections of the arguments in my brief (DKelly Brief) to discuss and rebut the arguments included in the brief filed by Central Maine Power Company (CMP Brief).¹

In addition, I have reviewed the Town of Caratunk reply brief (Filing 580) filed today, and fully support it. I have not repeated those comments here, but incorporate them by reference.

The overall conclusion of the reply brief remains the same as the initial brief - that the Commission should decline to issue a Certificate of Public Convenience and Necessity (CPCN) on the petition of CMP for its New England Clean Energy Connect (NECEC) petition.

The sections discussed below are:

- Public Need (*Restates the DKelly Brief section on CMP Public Need Standard in 2014-00048*)²
- NECEC is a High Impact Transmission Line (*Gen Lead Argument by CMP*)
- Insufficient Analysis of Alternative Routes Including Undergrounding
- Greenhouse Gas Emissions
- Risks / Risk Reduction Solutions (CMP Exponent Report – Public Safety and Health)

¹ All 2017-00232 February 1, 2019 briefs are available within the Maine Public Utility Commission document management system filed by docket number. CMP Brief is Filing 563 submitted on 2/1/2019. DKelly Brief is Filing 545 submitted on 2/1/2019.

² In Procedural Order filing 551, *"The Examiners deny Mrs. Kelly's request to admit a brief filed by CMP in docket No. 2014-00048 into the record in this proceeding for the reasons articulated by CMP in its February 1st comments. The Commission and Staff will disregard these portions of Ms. Kelly's initial brief."* This section substitutes for the disregarded portion using the Commission Order Filing 357 (10/8/2015) which summarizes CMPs position taken in their brief Filing 315 (7/25/2015).

1. Public Need.

The Commission's statutory requirement is to make a finding regarding whether the petitioned project is a "Public Need". In determining public need, the commission shall, at a minimum, take into account economics, reliability, public health and safety, scenic, historic and recreational values, state renewable energy generation goals, the proximity of the proposed transmission line to inhabited dwellings and alternatives to construction of the transmission line, including energy conservation, distributed generation or load management. If the commissions orders or allows the erection of the transmission line, the order is subject to all other provisions of law and the rights of any other agency to approve the transmission line.³

In its petition (Volume 1 Section IV, page 28), CMP provides weak rationale for why NECEC is a public need for Maine.

NECEC satisfies Massachusetts' public need for additional clean energy to meet GHG reduction goals as set forth in the RFP⁴, and advances Maine's progress toward meeting the public need for additional renewable energy, reducing levels of GHG, and lower and more stable electricity prices in the State.

The CMP Brief discusses the Public Need standard from page 5 to page 28, including quoting from the Commission Order in docket 2014-00048 "Emera Maine Request for Approval of Certificate of Finding of Public Conveyance and Necessity for Construction of Transmission Line in Northern Maine" (Emera Order).⁵

The PUC Commission in its Emera Order denying the petition for a CPCN, states on page 14, "The entity requesting the CPCN must demonstrate that the proposed transmission line is needed and is the most economical cost-effective solution to the need compared to alternative solutions."⁶

The order then states that the "most economical cost-effective solution" requires a balancing of factors. "The role that economics and state renewable energy goals play in a CPCN proceeding will vary with the

³ Title 35-A Part 3. Chapter 31 Subchapter 2. Section 3132(6).

⁴ CMP does not inform the reader that Massachusetts has included large dam hydro-electric with fluctuating water levels and without fish passage, as a suitable clean energy source, while Maine has not included electricity from these dams as qualifying for Maine's renewable portfolio standard.

⁵ the CMP brief quotes from CPCN Orders from Dockets from 1998 (when generation of electricity was just being deregulated) 2000, 2002, 2004, 2006, 2008, as well as dockets in this decade. Regarding older dockets, the significant changes that have occurred in the CPCN statute regarding factors to consider and the importance of alternatives means that those Orders were based on a different statutory requirement.

⁶ Quoting Central Maine Power Company and Public Service of New Hampshire, Request for Certificate of Public Conveyance and Necessity for the Maine Power Reliability Program Consisting of the Construction of Approximately 350 Miles of 345kV and 115 kV Transmission Lines (MPRP), Docket No. 2008-255 (Phase II) Order at 37-38 (Mar. 17, 2011).

facts and circumstances of each CPCN. Moreover, there are different ways of examining the economics of a project.”⁷

Thus, the question for the Commissioners is whether the CMP NECEC proposal is, in fact, *needed and is the most economical cost-effective solution to the need compared to alternative solutions*.

Although the CMP Brief on page 7, quotes from this same page 14 of the Emera Order, the CMP Brief ignores the quote “The entity requesting the CPCN must demonstrate that the proposed transmission line is needed and is the most economical cost-effective solution to the need compared to alternative solutions”.

The CMP Brief quotes only two side issues about public need from page 14.

- *the role that economics and state renewable energy goals play in a CPCN proceeding will vary with the facts and circumstances of each CPCN, and*
- *with regard to [the transmission line’s] character, size, installation, and maintenance.*

I hope the Commission takes notice of the cherry-picking of quotes on page 14, and recognizes that tendency for what it is.

In the Emera Order, the Commission describes the CPCN proceedings as well as the testimony and briefs of the parties. The Emera Order on page 37 refers to the CMP brief:

*Maine GenLead-NMI, CMP, and NHT assert the Emera proposal fails to **(1) address market issues and (2) support the development of renewable generation in northern Maine**. . . CMP and NHT note that Emera’s proposed line, unlike the ISO-NE connections, would not support the development of renewable generation, which they argue Maine law expressly favors. CMP Br. At 14. (emphasis added).*

The Order also refers to CMP’s brief related to the Public Need Standard:

*Here some of the parties have argued that **need can be found even if the reliability need** is met. Thus, parties have submitted testimony regarding ways in which ISO-NE interconnection proposals may **impact competition in northern Maine**, or the **State’s renewable energy goals**, thereby benefitting ratepayers by way of increased competition in the supply market or meeting policy goals set by the Legislature¹².*

⁷ Id. at page 14.

[Footnote 12 continues] ...*(s)everal parties cite market competition as a relevant consideration. See, e.g., CMP brief at 9.*⁸ (emphasis added).

Based on information included in the Emera Order, CMP was arguing that, because solutions other than the Emera petition were described in testimony, the public need standard required the project to not only address reliability but should also improve competition and further the State’s renewable energy policy.

When CMP’s 2015 public need test⁹ is applied to the NECEC CPCN petition:

- NECEC does not appear to meet any Maine long-term reliability need
- NECEC doesn’t improve competition in the Maine electricity markets
- NECEC doesn’t further the State of Maine’s renewable energy generation policy

Based on the test for “public need” that CMP advocated in the 2014-00048 proceeding, NECEC should not be granted a CPCN.

Similarly, if there is a follow-on inquiry to NECEC (2017-00232), it should include the non-Maine alternative transmission solutions, such that there is a comparison and weighing of the costs and benefits of these alternatives to Maine and the Maine ratepayers so that a truly “best alternative” is approved.

C. What CMP ratepayers NEED from CMP and it’s not NECEC.

CMP ratepayers and Maine need our public utility monopoly to be a trusted, capable partner continuously improving Maine’s transmission and distribution system so it meets our needs safely, reliably and cost-effectively. That is the job we need CMP to get back to doing. Nothing in the CMP brief addressed how NECEC would help improve this most important public utility purpose.

2. NECEC is a High-Impact Electric Transmission Line, as that term is defined in Title 35-A Section 3131, definition 4A.

⁸ Id pages 14-15.

⁹ As expressed in the Emera Order docket 2014-00048.

The DKelly Brief argued for a full and fair evaluation of the Transmission Line corridor proposed for NECEC because, by definition, NECEC is a high-impact electric transmission line. Nothing in the CMP brief countered the high-impact designation.

However, the CMP Brief does suggest that the Commission may apply “less scrutiny” to the CPCN petition for NECEC because they maintain there is no cost to Maine ratepayers.¹⁰

This reply brief finds the argument offered for a “less scrutiny” evaluation to be fatally flawed.

The CMP brief attempts to have NECEC considered as a “gen lead”¹¹ since gen leads are exempt from Section 3132. If the CMP brief argued for NECEC to be fully considered a gen lead, exempt from Section 3132, and also without a right of eminent domain and with a requirement to fully comply with each community’s zoning requirements, that would be a legitimate request to consider whether NECEC conforms to the Small Generator Interconnection requirements.¹²

However, the CMP brief wants NECEC to have the lower scrutiny of the exemption from the Certificate of Public Convenience and Necessity, and also wants to maintain the benefits that come with a determination of public need: the ability to overstep local control requirements.

CMP cites to a Rumford Power Associates docket from 1998, twenty years ago, when electricity generation was just being deregulated and the current requirements for considering many factors and alternatives before granting a CPCN were not yet in place. Given the flux in the electricity system at that time, the rules now in place for generator leads, and the current requirements for a CPCN, it seems that the appropriate comparison is to the current requirements and rules for generator leads and the current requirements and rules for a CPCN for a transmission line.

This reply brief strongly rejects CMP’s assertion that NECEC should be granted a CPCN, based on lesser scrutiny, especially as the NECEC is a high-impact transmission line.

¹⁰ CMP Brief pages 27-28.

¹¹ Gen lead exemption from the Public Need evaluation. See Section 3132 (1-B) Exception; Generator Interconnection Transmission Facility.

¹² Rules for larger Small Generator Interconnections (not subject to FERC jurisdiction) are regulated in 65-407 Chapter 324 of the PUC regulations under Level 4 in Section 14A and require that the Gen Lead get local zoning approval.

3. Insufficient Analysis of Alternative Routes Including Undergrounding.

The CMP application and the CMP Brief give no attention to the alternative of placing significant portions of the HVDC line underground. CMP refuses to address the significant scar this transmission line would have on our western mountains and the safety benefits that accrue from having the transmission line underground. Actual cost information about burying the line is not available since CMP did not propose that as an alternative, but the cost of other buried HVDC lines in the Northeast has been deemed acceptable. The refusal to even consider alternatives that significantly bury the HVDC line, is sufficient reason to deny the NECEC CPCN.

The agreement by CMP to underground the transmission line at the Gorge after strenuous objections about cost, doesn't negate that the CPCN petition is inadequate because it did not evaluate the practical and dramatically less impactful alternatives that have been highlighted in this proceeding: undergrounding a significant portion of the line (along primarily logging roads).¹³

The CMP Brief describes the decision to put the transmission line underground at the Gorge¹⁴. "Notably, in response to feedback from area residents, business owners, and environmental regulators, CMP amended the NECEC design to incorporate an underground crossing of the Upper Kennebec River using horizontal directional drill ("HDD") technology. CMP submits that undergrounding the NECEC at this river crossing will best minimize impacts on individuals using the area for recreational purposes, including for whitewater rafting."

In its brief, CMP just refuses to acknowledge the many comments about placing significant portions of the line underground. Instead of offering alternatives that include significant burial of the transmission line, such as recommended by AMC and offered in alternative proposals for Hydro-Quebec power through Vermont and New Hampshire, the NECEC petition and brief remain silent.

As stated in the DKelly brief, Avangrid (CMP's parent company) in 2012 proposed to build Connect New York, a completely underground 1000 MW HVDC line. Their response to the Request for Information stated, the proposed project "provid(es) affordable and reliable energy, while improving the environment .

¹³ See Appalachian Mountain Club testimony from 10/17/2018 Public Testimony Part 1. Filing # 421 AMC D Publicover

¹⁴ CMP brief page 127.

. . By burying an efficient, underground DC bulk transmission line, line losses will be reduced and aesthetic and health based concerns eliminated.”¹⁵

This omission of alternatives with significant undergrounding of the NECEC HVDC transmission line is contrary to the required evaluation of alternatives prior to granting a CPCN.

4. Greenhouse Gas Emissions.

The CMP brief discusses greenhouse gases from page 98 to page 121. The brief however, just ignores the competing projects in Vermont and New Hampshire that, like NECEC, will cost their state’s utility ratepayers nothing, and will result in the same greenhouse gas reduction effect (and electricity rate stabilizing effect) for New England.

Additionally, the unwillingness of Hydro-Quebec to be a party to the NECEC and testify, should make the assertions in the CMP Brief¹⁶ regarding spillage, and whether there were outlets for the electricity that was greater than Hydro-Quebec’s cost, inconclusive.

If the Commission feels that Hydro-Quebec’s management decisions on spillage are an important factor in its decision to issue a CPCN, then Hydro-Quebec should be required to testify and be cross-examined before a CPCN is issued.

The CMP brief did not address the social and environmental cost that large dam hydroelectricity reservoirs cause, including the impact of stoppering up mighty rivers, mercury contamination, impact on fisheries, and the overall impact on climate. As stated in DKelly brief, the Clean Water Act would not allow these hydroelectric dams to be constructed in the United States today. Maine law does not consider these large, fluctuating water level, insufficient fish passage dams as qualifying for the renewable portfolio standard. In order to consider these hydro-electric dams differently, we would need new law in Maine. The fact that Massachusetts unilaterally deemed Hydro-Quebec electricity “clean energy” does not trump the Maine legal process.

¹⁵ DKelly brief page 8.

¹⁶ CMP brief pages 104-111.

As stated in DKelly brief¹⁷, in conjunction with evaluating whether Quebec hydroelectric power will be used regardless of whether NECEC is constructed, the Commission should consider whether Hydro-Quebec's continuing building of new dams is a "public need" of Maine, given the scientific questions raised in this proceeding about fishery impacts, mercury contamination and silica transport disruptions. "In addition, recent studies entered in the record for this case calculate that hydroelectric dams are important emitters of methane and carbon dioxide. It is hyperbole to call hydroelectric dam energy "clean energy" with the current state of the scientific evidence."

5. Risk / Risk Reduction

The risks and risk reduction evaluation process and solutions for building and operating an above-ground high voltage direct current line (the first one that CMP would operate) needs careful review. From my earliest testimony dated 1/26/2018 (Filing 50), I testified that "a full understanding of the advantages and disadvantages of HVDC lines, especially concerning environmental and safety issues, should be available as part of the CPCN."¹⁸

The DKelly Brief concludes in Risk and Risk Reduction section, "[t]he above arguments and the lack of documentation regarding the systematic consideration of the risks that are associated with the design and operation of the HVDC line [and converter station] for NECEC adds weight to the recommendation that this CPCN is not ready for approval."¹⁹

The CMP Brief has a section entitled Public Health and Safety on page 122. CMP offered into the record a Report from Exponent Inc. "Modeling of the Electrical Environment New England Clean Energy Connect", Filing 47 on January 12, 2018. It is a narrow report that uses models developed in 1983 to 1991 to determine static electric fields, magnetic fields and air ions associated with the operation of the DC and AC portion of the NECEC project. There was no mention of experimental testing to validate the modelling, not even on the AC modelling where the transmission lines are already in existence. The report makes no representation about whether these values will be guaranteed maximum levels or even within an order of magnitude to the levels that will exist once the line is constructed and used over time.²⁰

¹⁷ DKelly brief page 11.

¹⁸ DKelly brief page 14.

¹⁹ DKelly brief page 16.

²⁰ The report was not a visible part of the NECEC review process and testimony by witnesses at the Maine PUC. Dot Kelly was not even aware the report was in the record until this fall.

The report does give a good background description of the NECEC transmission line and an overview of Static Electric Fields, Static Magnetic Fields and Corona Phenomena (Space Charge). The report does note that, “Corona occurs around the conductors of DC transmission lines when the electric field at the conductor surface exceeds the insulating capacity of the surrounding air. . . Transmission lines are designed so that ideally they would produce minimal corona. The presence of water droplets, insects, nicks, debris, or other surface roughness on the conductor can initiate corona.²¹ There was no discussion on how aging, or prior imperfections or damage impact the rate of corona at those areas.

On page 16, the report de-emphasizes that HVDC line corona discharges are much more significant than HVAC corona line discharges.

In contrast to DC transmission lines, however, corona on AC transmission-line conductors results in minimal space charge around the line because the voltage of an AC conductor is constantly changing from positive to negative in a cycle that repeats 60 times per second (60 Hz). Unlike corona activity on a DC line, space charge around an AC line does not add to the electric field created by the transmission conductors.

In addition, the stray current emitting from an HVDC line, which is known to cause oxidation and corrosion, was not explicitly addressed.

Overall the report concluded that, based on safety limits from NRPB (2004) for DC static electric field, INCIRP (2009) for DC static magnetic field and the fact that there was no health guideline used for “space charge”, no exceedances of these reference standards were modeled. Similarly, no exceedances were noted for the AC lines right-of-ways or the combined AC and DC lines right-of-way.

Though I cannot conclude the reference levels used in the Exponent report are too high, industries have been known to underestimate the hazards associated with their business. Notwithstanding the fact that x-rays, radium, lead (formerly used in paint and gasoline), asbestos, silicone and cigarette smoke are just some examples of health hazards that were once dismissed as immaterial, it can’t be concluded that the reference levels, such as those used by Exponent, will definitely be revised downward over time²².

²¹ Exponent report Modeling of the Electrical Environment New England Clean Energy Connect (NECEC-Exhibit 16), page 11.

²² Although history does suggest that the lowering of the EMF health-based levels is a foregone conclusion.

What is clear is that the widespread, long-term impact on public health from electro-magnetic radiation continues to be an area of active research. What is also assumed is that undergrounding the HVDC lines reduces the exposure and risks from these fields and currents.

Regarding the broad issue of public health and safety related to the transmission line and converter station, the applicant has the duty to show that the project will meet the requirements of the CPCN, including protecting public health and safety. The CMP brief, does not do that. Instead, it merely claims that no party (in my case a volunteer), “has offered testimony demonstrating in any way that the NECEC will be designed, constructed or operated in an unsafe manner.”²³

I leave it to the Commissioners to decide whether CMP has met its burden to protect the public health and safety given their strong focus on cost savings, and the specific email in the record stating that VSC-HVDC systems are extremely vulnerable under DC faults and have special needs that mean the NPCC requirements shouldn't be followed completely.²⁴ This reply brief asserts that the lack of documentation regarding the systematic consideration of the risks that are associated with the design and operation of the HVDC technology for NECEC adds weight to the recommendation that this CPCN is not ready for approval.

6. Conclusion

Based on the record in Docket 2017-00232, I respectfully request that the Commissioners do not grant a Certificate of Public Need and Convenience for the New England Clean Energy Connect petition.

Sincerely,

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²³ CMP brief page 124.

²⁴ DKelly brief page 15.