**STATE OF NEW HAMPSHIRE**
**SITE EVALUATION COMMITTEE**

**JOINT APPLICATION OF NORTHERN PASS TRANSMISSION, LLC, AND PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE D/B/A EVERSOURCE ENERGY FOR A CERTIFICATE OF SITE AND FACILITY**

**Docket No. 2015-06**

**Additional Information to Address**
**Revised SEC Rules Effective as of December 16, 2015**

Set forth below is additional application content to address those application requirements in the new Site Evaluation Committee ("SEC") rules that were not already addressed in the original application filed with the SEC on October 19, 2015. For any such new issues, the relevant new SEC rule is set forth in italics, followed by new narrative. Also, a list of attachments with additional information is provided at the end of this document.

***Site 301.03 Contents of Application.***

*(c) Each application shall contain the following information with respect to the site of the proposed energy facility and alternative locations the applicant considers available for the proposed facility:*

The Applicants provide the additional information as required by Site 301.03, as provided below. Please also see Applicants' Request for Partial Waivers Under the Newly Adopted SEC Rules for a request for a waiver from providing additional information on alternative locations the application materials for alternate route.

*(1) The location and address of the site of the proposed facility;*

The new requirement in these rules is for information on alternate locations the Applicants consider available. Northern Pass considered an alternate location for the Project that was available for a portion of the Project route, which included 47 miles of overhead transmission lines along existing transmission ROW. The location of the 47-mile alternate portion of the Northern Pass transmission line and associated facilities is shown on the NPT Project Maps Alternative Route as Attachment 1.

In the original Application, the Applicants identified the route in the 2013 amended application to the United Stated Department of Energy ("USDOE"), as being technically

"available." See Application, Volume I, page 44. However, the Applicants consider the 47 miles of overhead transmission lines, which has been replaced by approximately 52 miles of underground transmission line between Bethlehem and Bridgewater, no longer feasible and therefore unavailable. As the Project has no intention of pursuing this alternative, the Applicants have requested a waiver from providing this additional information. Please see Applicants' Request for Partial Waivers Under the Newly Adopted SEC Rules.

(2) *Site acreage, shown on an attached property map and located by scale on a U.S. Geological Survey or GIS map*;

The site acreage for the alternate route is shown on a table on the first sheet of Attachment 1.

*(3) The location, shown on a map, of property lines, residences, industrial buildings, and other structures and improvements within the site, on abutting property with respect to the site, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property.*

Please see Applicants' Request for Partial Waivers Under the Newly Adopted SEC Rules requesting a waiver from strict compliance with this rule as it pertains to abutting properties. Although the vast majority of required information for abutting property is included in the original Application, some abutting properties along the Project's right-of-way ("ROW") extend beyond the mapped area depicted on Attachment 1 and 2.

*(4) Identification of wetlands and surface waters of the state within the site, on abutting property with respect to the site, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property, except if and to the extent such identification is not possible due to lack of access to the relevant property and lack of other sources of the information to be identified;*

The Project Maps provided in Appendix 1 of the original SEC Application show property lines, residences, industrial building, and other structures and improvements within the site and abutting properties extending for approximately ¼ mile to either side of the corridor. The maps also show the location of lines, structures, associated facilities, wetlands, resource areas, water bodies, highway crossings, and on-site access roads. These maps have been revised to include photo-estimated wetland boundaries and the 100-foot buffer to them, and approximate wetland and stream boundaries derived from existing digital data sources, and are re-submitted as part of this Additional Information as Attachment 2.

Within the Project ROW and other facility sites, wetlands were field delineated by or under the supervision of a NH Certified Wetland Scientist using the routine determination as described in the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (2012). The centerlines of streams less than 6 feet wide were flagged and GPS located, and the top of bank of streams greater than 6 feet wide were individually flagged and GPS located. Vernal pools were identified based on the definitions in the Department of the Army Programmatic General Permit– State of NH (USACE 2012), NHDES Wetland Rules (Env-Wt 101.99 (b)), and guidelines adapted by NHFG (NHFG 2004). The approximate boundaries of the spring high water mark of vernal pool depressions (or center of pools less than 10 feet in diameter) were flagged and GPS located.

Within 100 feet of the edge of the Project ROW and within 100 feet of the limits of disturbance for substations, transition stations, and converter terminal ("Project Boundary"), wetlands and surface waters were mapped through photointerpretation of aerial imagery from NH GRANIT supplemented with topographic maps, 2-foot LiDAR-derived contours, and GIS layers including the statewide National Hydrography Dataset ("NHD") and National Wetland Inventory ("NWI") mapping, and Natural Resources Conservation Service ("NRCS") hydric soils. There is no statewide data layer for vernal pools. No field survey was conducted.

On abutting properties beyond 100 feet from the Project Boundary, existing NHD stream layers and NWI mapping accessed via NH GRANIT was used to map wetland and stream resources. No aerial photo-interpretation was conducted on these areas and the public data layers have not been field verified. The estimated wetlands are shown in different colors on the maps to distinguish them from the jurisdictional, ground delineated wetland boundaries within the Project corridor.

Wetlands and surface waters along the 47 mile alternate route are also shown on Attachment 1.

Please see Applicants' Request for Partial Waivers Under the Newly Adopted SEC Rules, requesting a partial waiver from strict compliance with this Rule as some abutting properties extend beyond the mapped area as depicted on the Project Maps in Attachment 2.

(5) *Identification of natural, historic, cultural, and other resources at or within the site, on abutting property with respect to the site, and within 100 feet of the site if such distance extends beyond the boundary of any abutting property, except if and to the extent such identification is not*

*possible due to lack of access to the relevant property and lack of other sources of the information to be identified*;

Historic and cultural resources have been identified within the Area of Potential Effect ("APE") as determined by the US Department of Energy in consultation with the NH Division of Historical Resources ("DHR"). The above ground APE generally extends 1 mile from the edge of the Northern Pass corridor. The APE for archeological resources is limited to the corridor proper. To identify archeological resources on abutting properties, Northern Pass obtained the location from DHR of known archeological sites within a mile of the corridor. Locations of all archeological resources are confidential under RSA 227-C:11, so the information about these sites are listed in a confidential table at Attachment 3. A single copy of this archeological site information is being provided for the SEC. As the Applicants requested in their Motion for Protective Order and Confidential Treatment dated October 19, 2015, the Applicants request that the SEC maintain this archeological information as confidential under RSA 227-C:11 and RSA Ch. 91-A.

Please see Applicants' Request for Partial Waivers Under the Newly Adopted SEC Rules requesting partial waiver from strict compliance with this Rule to the extent of any potentially-eligible historic resources on abutting properties beyond the APE.

(6) *Evidence that the applicant has a current right, an option, or other legal basis to acquire the right, to construct, operate, and maintain the facility on, over, or under the site.*

Please see the Pre-Filed Testimony of Kenneth Bowes, Attachment 4, for a complete summary of evidence that the Applicants have the current right, an option, or other legal basis to acquire the right to construct, operate, and maintain the facility on, over, or under the site.

*(7) Evidence that the applicant has a current or conditional right of access to private property within the boundaries of the proposed energy facility site sufficient to accommodate a site visit by the committee, which private property, with respect to energy transmission pipelines under the jurisdiction of the Federal Energy Regulatory Commission, may be limited to the proposed locations of all above-ground structures and a representative sample of the proposed locations of underground structures or facilities.*

Please see the pre-filed testimony of Kenneth Bowes, Attachment 4, for a summary of evidence that the Applicants have a current or conditional right of access to private properties within the boundaries of the proposed energy facility sufficient to accommodate a site visit by the Committee.

***Site 301.04 <u>Financial, Technical and Managerial Capability</u>.*** *Each application shall include a detailed description of the applicant's financial, technical, and managerial capability to construct and operate the proposed energy facility, as follows:*

*(a) Financial information shall include:*

*(4) An explanation of how the applicant's financing plan compares with financing plans employed by the applicant or its affiliates, or, if no such plans have been employed by the applicant or its affiliates, then by unaffiliated project developers if and to the extent such information is publicly available, for energy facilities that are similar in size and type to the proposed facility, including any increased risks or costs associated with the applicant's financing plan; and*

NPT is currently planning to finance this Project as the Applicant's affiliates have historically financed similar transmission projects, with short-term and long-term debt, and equity contributions from parent. See Section 301.03(h)(5) of the Application and the Pre-Filed Testimony of Michael Ausere.

*(5) Current and pro forma statements of assets and liabilities of the applicant;*

Please see Attachment 5 for the current pro forma statement of assets and liabilities for NPT. There is no pro forma for PSNH because its assets and liabilities will not be affected by the Project.

*(b) Technical information shall include:*

*(2) A description of the experience and qualifications of any contractors or consultants engaged or to be engaged by the applicant to provide technical support for the construction and operation of the proposed facility, if known at the time of application;*

The Applicants have engaged a number of companies to support the design, procurement, construction and operation of the Project. The Applicants have engaged Quanta Services ("Quanta") to manage a number of aspects of the Project. Quanta is a holding company consisting of a number of subsidiary companies. These subsidiaries have independent expertise in various aspects of energy transmission projects and work together to ensure the efficient and effective utilization of their combined resources. Under this structure, Quanta is recognized as the largest transmission and distribution specialty contractor in North America. Their New Hampshire offices are located in Bow, NH. Quanta has worked nationally on an array of transmission projects aimed at enhancing service reliability across most states in the union.

Through their agreement with Quanta, the Applicants have engaged with the following Quanta subsidiaries to manage specific components of the Project: PAR Electric, Longfellow Drilling, Inc., M.J. Electric, Underground Construction Company and Crux Subsurface, Inc.

PAR Electric ("PAR") has been employed as the general contractor for the Project and will be responsible for project management, the overall schedule of construction, project budgeting, and the management of other construction and supply vendors. PAR owns more than 5,000 pieces of specialized transmission line construction equipment, the largest fleet in America. They have constructed transmission lines ranging from 765 kV to 69 kV. PAR has worked extensively in New England for Eversource constructing transmission and substation facilities ranging from 34.5kV to 345kV.

Longfellow Drilling, Inc. ("Longfellow") has been engaged to manage the installation of the foundations for the Project. Longfellow is a specialty contractor with expertise in the installation of drilled pier foundations for a variety of projects. In 2010, Longfellow received the Iowa Quality Initiative Structures Award in recognition of their work on the U.S. 52 Bridge over IC&E & Mill Creek in Des Moines, Iowa.

Underground Construction Company ("UCC") has been engaged to manage trenching for the underground section of the Project. With 80 years of experience in underground projects in the gas, power and telecom industries, UCC has successfully completed thousands of construction projects throughout the United States. One notable project is the Chino Hills 500 kV underground transmission project. This project consists of approximately 3.5 miles of underground trenching for a 500 kV transmission line. Once completed, this will be the first underground 500 kV project in the country.

Crux Subsurface, Inc. ("Crux") is a foundation engineering, procurement and construction ("EPC") contractor with expertise in designing and constructing specialty foundations for transmission structures. Crux has been specifically engaged to design and install foundations in the more logistically challenging portions of the Project. Crux recently provided EPC services within a Priority Wetland for Public Service Electric & Gas Company's Susquehanna-Roseland Electric Reliability Project. This particular project is a 500 kV transmission line and Crux was hired to minimize impacts to wetlands and facilitate construction activities within a 1.5-mile segment traversing a wetland.

M.J. Electric ("MJE") has been engaged to manage the engineering, procurement and construction of the Project converter terminal in Franklin, New Hampshire. MJE has over 50 years of experience in the electrical construction industry with project expertise in managing transmission, distribution and substation construction projects. With regard to substation construction, MJE recently provided EPC services for a 345/115 kV substation in Killingly, CT. This involved making modifications and enhancements to five existing electrical substation

facilities as well as the addition of a new 345 kV breaker. Additionally, MJE managed the installation of the below grade conduit and grounding, the erection of the substation steel, three MVA transformers and other technical additions to the Northlake Data Center Substation in Northlake, IL.

The Applicants have also engaged ABB to manage the engineering and construction of the underground HVDC cable and, in conjunction with MJE, the Franklin converter terminal. With regard to the underground line, ABB will be in charge of manufacturing, pulling and splicing the HVDC line. ABB is a global engineering company with a core focus on providing engineering solutions for the utility sector, and specifically electric infrastructure. ABB employs engineering solutions targeted at improving grid reliability and efficiency while reducing environmental impact. To that end, ABB's utility project portfolio is extensive and comprehensive. With over 140 years of experience, ABB provides installation services for a range of High Voltage Direct Current (HVDC) and alternating current (AC) transmission line projects. ABB has pioneered HVDC technology more than 60 years ago and has been awarded over 110 HVDC projects, representing a total installed capacity of more than 120,000 megawatts and accounting for around half of the global installed base. For example, between 2002 and 2003, ABB completed a 40-km long HVDC Light bipolar subsea cable link that stretches between New Haven, Connecticut and Long Island, New York.

In addition to transmission lines, ABB has over 100 years of experience in substation design and construction and is globally recognized for its work in power automation technologies. ABB offers a range of products and services for substation automation technology upgrades that improve grid reliability and resiliency while increasing overall efficiency. Currently, ABB is engaged in the partial construction and upgrade of the Connah's Quay substation in the United Kingdom. This project consists of the construction of a new 24-bay GIS substation as well as the integration of three new 400/132 kV grid transformers.

*(c) Managerial information shall include:*

*(2) A description of the qualifications of the applicant and its executive personnel to manage the construction and operation of the proposed facility; and*

For a description of the qualifications of NPT and Eversource to manage the construction and operation of the Project, see Section 301.03(h)(5) of the Application. Eversource has extensive experience managing and operating the largest electric utility system in New England.

For a description of the qualifications of the Applicant's executive personnel, please see the resumes of William J. Quinlan, James Muntz, and Kenneth Bowes.

> *(3) To the extent the applicant plans to rely on contractors or consultants for the construction and operation of the proposed facility, a description of the experience and qualifications of the contractors and consultants, if known at the time of application.*

See Section 301.04(b)(2) above for a description of the Applicants' contractors.

***Site 301.05 <u>Effects on Aesthetics</u>.***

> *(b) The visual impact assessment shall contain the following components:*
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> *(4) A computer-based visibility analysis to determine the area of potential visual impact, which, for proposed*:
>
> *(d) Electric transmission lines longer than 1 mile if located within any rural area shall extend to:*
>
> *(2) A radius of 10 miles if the line would be located in a new transmission corridor or in an existing transmission corridor if either or both the width of the corridor or the height of the towers, poles, or other supporting structures would be increased;*

Attachment 6, Viewshed Analysis, consists of computer-based viewshed maps (visibility analysis) that illustrate where the Project may possibly be visible within ten miles of the centerline of the transmission corridor. The comparable viewshed maps supplied with the October 14, 2015 Visual Impact Assessment ("VIA) covered an area within five miles of the centerline of the transmission corridor.

> *(5) An identification of all scenic resources within the area of potential visual impact and a description of those scenic resources from which the proposed facility would be visible;*

The October 14, 2015 VIA identified and assessed scenic resources within 3 miles of the transmission line. Those resources with at least a medium level of scenic significance within the area of potential visual impact were evaluated. This filing of additional information identifies and characterizes the potential impact on the scenic resources within the area of potential visual impact located 3-10 miles from the transmission line. These are located on the viewshed maps and identified in the Scenic Resource Identification & Assessment, provided in Attachment 7.

*(7) Photosimulations from representative key observation points, from other scenic resources for which the potential visual impacts are characterized as "high" pursuant to (6) above, and, to the extent feasible, from a sample of private property observation points within the area of potential visual impact, to illustrate the potential change in the landscape that would result from construction of the proposed facility and associated infrastructure, including land clearing and grading and road construction, and from any visible plume that would emanate from the proposed facility*;

Attachment 8 provides photosimulations from 28 representative private property observation points at varying distances within the area of potential visual impact.

*(8) Photosimulations shall meet the following additional requirements:*

*(b) Photosimulations shall be printed at high resolution at 15.3 inches by 10.2 inches, or 390 millimeters by 260 millimeters;*

The photosimulations from the October 14, 2015 VIA have been reprinted at high resolution at 15.3 inches by 10.2 inches and are included in Attachment 9. The photosimulations from a sample of private property observation points are also produced at this size and are provided in Attachment 8.

*(c) At least one set of photosimulations shall represent winter season conditions without the presence of foliage typical of other seasons;*

In the October 14, 2015 VIA, photosimulations were provided for 30 scenic resource locations. Of these, seven are representative of winter season leaf-off foliage conditions. This filing includes 20 additional photosimulations representative of winter leaf-off foliage conditions and 3 photosimulations showing partial leaf-off conditions (late autumn). See Attachment 9 for photosimulations of leaf-off conditions.

*(d). Field conditions in which a viewpoint is photographed shall be recorded including:*

*(3) All camera settings at the time the photograph is taken;*

The photographs used in the photosimulations were taken with a 24.1 megapixel Nikon D7100 digital camera, equipped with an 18-55 mm lens. Images are taken with the camera set on Program Mode, which automatically determines the f-stop and exposure time. Image Quality is set on Fine; Image Size is set on either Medium or Large. Focus Mode is typically set on Automatic. ISO is typically set a 400; depending upon light conditions it could vary up to 1000. Focal Length is set at 35mm, which creates an angle of view that closely matches human visual perception.

*(4) Date, time, and weather conditions at the time the photograph is taken;*

The Technical Information provided for each photosimulation in the October 14, 2015 VIA has been expanded to include the local weather conditions when the photograph was taken.

> *(10) A description of the measures planned to avoid, minimize, or mitigate potential adverse effects of the proposed facility, and of any visible plume that would emanate from the proposed facility, and the alternative measures considered but rejected by the applicant.*

Descriptions of the proposed mitigation measures for the Project are presented in the October 14, 2015 VIA in Section 9 in Methodology (p. M-16) and in Section 8 in the Conclusion. As noted in the VIA, the current Project involves an extensive number of measures that have been incorporated into the planning and design to avoid, minimize, and mitigate unreasonable adverse impacts on aesthetics.

The Applicants have incorporated mitigation measures to avoid and minimize potential visual impacts to the most sensitive landscapes along the route. Notable measures include the use of an existing transmission corridor throughout most of its length to minimize the amount of new corridor clearing, the burial of 52 miles of the line to avoid impacts to the White Mountain National Forest region and surrounding area, and the use of weathering steel structures in areas of scenic sensitivity. The steps taken by the Applicants to avoid, minimize and mitigate adverse visual effects of the Project are best practical measures.

Mitigation measures that were considered but rejected by the applicant are as follows:

- Black clad chain link at transition stations. Substations and transition stations are typically enclosed by chain link fencing for safety and security reasons. Under certain circumstances, this type of fencing can result in color contrasts between the galvanized fence fabric and the immediate surroundings. One measure that can be used to reduce this contrast is to coat the fencing with colored plastic. This measure was rejected since the coating can interfere with the grounding required in these types of installations.

- Vegetation management within transmission corridor. In several locations the transmission line will be visible from higher elevations where managed vegetation within the cleared corridor will produce a contrast in color and texture within the surrounding landscape. The design team briefly looked at the concept of planting species within the corridor that were similar in color and texture to the abutting land (e.g., Christmas tree farms or orchards). However, the Applicant generally does not own the land that is traversed by the corridor and does not have the ability to dictate uses other than for electrical transmission.

- Painted transmission structures. Several companies produce paint products that can be applied to transmission structures to reduce their color contrast. This measure was rejected in favor of using weathering steel monopole structures in areas of greater visual sensitivity.

- Non-specular finish on conductors. Conductors can be treated either chemically or mechanically to reduce reflectivity, and thus produce less color contrast when seen against a wooded background. The natural weathering process produces the same effect within six months to three years after installation, and the advantages of a non-specular finish would not outweigh other considerations (i.e., limited time benefit, coordination, and costs).

There are a number of site-level mitigation measures that are not included in the proposal, but may be able to be used when dealing with individual properties and specific places. These measures have not been rejected, but will be considered at the time of final engineering. These include:

- Plantings to screen the transmission corridor at road crossings. Plantings of non-capable species (i.e., those trees and shrubs that will not achieve a certain height, usually 16 feet) can be an effective way to limit visibility from public roads down transmission corridors. Since most of the NPT project is located on utility easements (and not land owned by the applicant), permission to plant in these locations would require approval of individual landowners.

- Making adjustments to the location of individual structures to avoid views and/or take advantage of existing vegetation. This would be a continuation of the ongoing practice for siting structures.

- Adjustments to the alignment of the underground sections of the transmission line to minimize effects on the existing landscape.

- Installation of plantings and/or earth berms or other screening devices to minimize views of transition stations.

***Site 301.06 <u>Effects on Historic Sites</u>.*** *Each application shall include the following information regarding the identification of historic sites and plans for avoiding, minimizing, or mitigating potential adverse effects of, the proposed energy facility on historic sites*:

*(c) Finding or determination by the division of historical resources of the department of cultural resources and, if applicable, the lead federal agency, that no historic properties would be affected, that there would be no adverse effects, or that there would be adverse effects to historic properties, if such a finding or determination has been made prior to the time of application.*

At the time of the Application, and as of the date of this, neither DHR nor the lead federal agency, the United States Department of Energy ("USDOE"), has made a finding or determination whether historic properties would be affected.

*(d) Description of the measures planned to avoid, minimize, or mitigate potential adverse effects on historic sites and archaeological resources, and the alternative measures considered but rejected by the applicant; and*

The Application as submitted describes the avoidance and minimization measures taken by the Project, including changing the location of the route (including a substantial increase in the underground segment), changes to the location of individual parts of the facility, and changes to structure height and design in many locations. Such changes were not done at every location along the route where they were considered.

The avoidance and minimization steps taken by the Applicant are best practical measures.

***Site 301.07 Effects on Environment.*** *Each application shall include the following information regarding the effects of, and plans for avoiding, minimizing, or mitigating potential adverse effects of, the proposed energy facility on air quality, water quality, and the natural environment:*

> *(5) Description of the measures planned to avoid, minimize, or mitigate potential adverse impacts of construction and operation of the proposed facility on wildlife species, rare plants, rare natural communities, and other exemplary natural communities, and on critical wildlife habitat and significant habitat resources, and the alternative measures considered but rejected by the applicant;*

Alternative avoidance, minimization and mitigation measures considered but rejected include the following:

- An attempt was made to avoid the potential exemplary natural community in Dixville (Northern Hardwood Seepage Forest). Shifts to the north were investigated, but this resulted in an increase in wetland impacts. Shifts to the south would result in greater visual impacts.
- The Project considered moving all structures out of the protected shoreland, which in some cases would increase wetland impacts. Those changed placements that would have increased wetland impacts were rejected.
- A restriction to clear only in the winter season, which would have been detrimental to deer wintering areas and impracticable, was not included in construction planning.
- Some localized shifts in structure locations were rejected, as these would result in a ripple effect of structure locations with greater resulting natural resource impacts.
- A specification of low ground pressure ("LGP") equipment was not adopted, as LGP vehicles are not universally owned by contractors, and their use is unnecessary if swamp mats are used in sensitive areas (wetlands, RTE plant locations).

- Wetland Creation / Enhancement was considered, but was not selected because there were no good opportunities on the Project properties.

- Mitigation projects were proposed by Municipalities along the route, but were not included for the reasons described in the Application (Appendix D of the Mitigation Report).

- A cash contribution to the Upper Connecticut River Mitigation and Enhancement Fund was not included in the final mitigation proposal as it addresses the same region/watershed as the proposed preservation parcels.

- An ARM fund payment only for all impacts, including the ones in the northern watersheds, was not selected as the final mitigation proposal. A combination of land preservation and an ARM fund payment is the preferred approach to satisfy all regulatory agencies' requirements.

- The Project was going to allow commercial seed mixes with naturalized species for restoration of temporary impacts in locations without rare plants, but it has committed to native seed mix everywhere per request of New Hampshire Natural Heritage Bureau. NHNHB.

The avoidance and minimization steps taken by the Applicant are best practical measures.

***Site 301.08 Effects on Public Health and Safety.*** *Each application shall include the following information regarding the effects of, and plans for avoiding, minimizing, or mitigating potential adverse effects of, the proposed energy facility on public health and safety*.

> *(d) For electric transmission facilities . . . an assessment of the risks of collapse of the towers, poles, or other supporting structures, and the potential adverse effects of any such collapse.*
>
> > *(1) Assessment of the risks of collapse of the towers, poles, or other supporting structures, and the potential adverse effects of any such collapse.*

Eversource proactively mitigates the risks associated with the collapse or failure of overhead transmission line elements during the course of engineering and throughout the facilities' lifecycle. The occurrence of a transmission line structure failure is a rarity and as such the potential for adverse impact is minimal.

Understanding the methods employed by engineers to mitigate the risk associated with failure of transmission line elements requires a basic understanding of how an overhead electric transmission line (transmission line) behaves mechanically. Transmission line structures are often grouped into categories with those utility structures supporting wind turbines and cellular antennas. The major difference between the structural system attributed to a transmission line

and those structural systems associated with wind turbines or cell towers is that the structural system for a transmission line is composed of two distinct subsystems consisting of the wires (shield wire and conductor) and structures. The wires and structure act together as a system and as a result, limit the failure of a transmission line structure. In the unlikely event a structure fails, the wires prevent the total collapse of the structure.

The majority of the structural loading is associated with the wire system. The conductors and shield wires associated with a particular circuit are subject to wind, ice, and changes in temperature. As such, the design considerations utilized by Eversource take into account a variety of different loading conditions as outlined in governing code (National Electrical Safety Code, 2012 Edition) ("NESC") and based on internal company standards that have been developed based on previous extreme weather conditions encountered during operation over the past 100 years. These loading conditions include, but are not limited to, the following:

- NESC Heavy Loading (250B)
- NESC Extreme Wind (250C)
- NESC Extreme Ice with Concurrent Wind (250D)
- Eversource Heavy Ice

Recognizing that there are some events that cannot be predicted or prudently incorporated into the engineering considerations utilized for the design of a transmission line, Eversource employs practices to minimize risks should the failure of a structural element occur. The American Society of Civil Engineers ("ASCE") Manual and Report on Engineering Practice No. 74 "Guidelines for Electrical Transmission Line Structural Loadings" has several recommendations for mitigating the risks associated with both exceeding the anticipated loading conditions as well as the loss of a structure. These recommendations include the installation of structures designed to withstand heavy longitudinal loads at periodic intervals along the length of a line to limit the potential length of cascading failures, designing suspension structures to withstand differential or broken wire cases, and using historic weather data and events to create specific loading conditions reflective of what a circuit may be subject to over its life should those loading conditions not be characterized by the base loading conditions defined by the NESC. Eversource employs the practices outlined above to provide a cost efficient and reliable design. In addition, all supporting structures have been designed to comply with Grade B construction as outlined in Section 24 of the 2012 NESC, which is the most robust design category contained in the NESC. Overload factors and factors of safety are incorporated based on sound engineering

practice as another mitigation measure so that in the event that these loading conditions are exceeded transmission line structures have the ability to maintain their integrity.

The mode of failure associated with a transmission line structure collapse is dependent upon a number of different factors. These considerations include the condition of the structure, types of load imposed by the wire system at the time of failure, fixity of wire attachments and their location on the structure, foundation type, and ground line conditions. Transmission line structures can also be designated as having failed without catastrophic collapse occurring. Any deformation state above the recoverable limit of an element is considered as having failed and would be proactively addressed.

In instances where transmission line structures have failed catastrophically, the collapse pattern is seldom one in which a single or multiple pole structure fails about the base creating the potential for a radial zone of impact. Rather, these failures tend to result in the failed structure buckling and failing within its original footprint or being pulled in along the line of the wire with the point of deformation located above ground line. Given the footprint of those structures proposed on the Project and their placement, should a structure fail, there is a very high degree of probability that any and all elements will remain within the bounds of the ROW, mitigating the potential adverse impact associated with such a failure.

In addition to the engineering considerations utilized by Eversource to mitigate the risk associated with structure collapse, Eversource has a robust inspection and maintenance programs that call for the inspection of transmission facilities on a cyclical basis to make sure that any deterioration of assets is proactively addressed before it becomes an issue. These inspections are conducted in the form of aerial patrols (e.g. via helicopter) and walking inspections.

Lastly, should the integrity of a structure be compromised, the system is configured with relaying systems that detect faults and de-energize the line. Eversource has internal work forces that can be deployed quickly to address any failures as well as a wide spread network of contract line workers who can be engaged to assist when an event occurs. Materials necessary for the restoration of a compromised structure can be obtained and deployed once a solution to a tower failure has been developed.

*(e) For all energy facilities:*

(2*)* *A facility decommissioning plan prepared by an independent, qualified person with demonstrated knowledge and experience in similar energy facility*

*projects and cost estimates; the decommissioning plan shall include each of the following:*

On page 53 of the Application, the Applicants address the requirement of RSA 162-H:7, V(g) to "[d]escribe in reasonable detail the elements of and financial assurances for a facility decommissioning plan." The Applicants have also filed a Request for Partial Waivers Under the Newly Adopted SEC Rules with respect to the requirement that the Applicants retain an independent person to prepare a decommissioning plan, as well as certain rules regarding the content of the decommissioning plan.

The Applicants will submit to the Committee a complete decommissioning plan prior to initiating the removal of the Project, should decommissioning be required (transmission lines are rarely decommissioned). The decommissioning plan will provide details of each element of the Applicants' plan to decommission the Project, consistent with then-current environmental, safety, and other regulatory requirements.

*a. A description of sufficient and secure funding to implement the plan, which shall not account for the anticipated salvage value of facility components or materials;*

Please see the Pre-Filed Testimony of Michael Ausere, page 53 of the Application, and Section 9.3 of the Transmission Service Agreement ("TSA") as found in Appendix 16, between NPT and Hydro Renewable Energy Inc., for a description of the sufficient and secure funding to implement a decommissioning plan. FERC has already accepted the decommissioning plan contained in the TSA.

Pursuant to the TSA, the Applicants will collect, through a FERC-approved rate, a monthly payment from Hydro Renewable Energy Inc. over the last five-years of the 40-year term of the TSA, termed the Decommissioning Payment Period, designed to cover the costs of decommissioning, which is defined as "the work required to (a) retire the Northern Pass Transmission Line and dismantle the materials, equipment and structures comprising the Northern Pass Transmission Line and (b) restore and rehabilitate any land affected by the construction or dismantlement of the Northern Pass Transmission Line, in each case, as required by Applicable Law."

*b. The provision of financial assurance in the form of an irrevocable standby letter of credit, performance bond, surety bond, or unconditional payment guaranty executed by*

*a parent company of the facility owner maintaining at all times an investment grade credit rating;*

As described above in Site 301.08(c)(2)(a), pursuant to the TSA, the Applicants will collect, through a FERC-approved rate the funds required to cover the costs of decommissioning. The Applicants request a waiver to the extent necessary from providing such financial assurance in the form of an irrevocable standby letter of credit, performance bond, surety bond, or unconditional payment guaranty executed by a parent company of the facility owner maintaining at all times an investment grade credit rating. Please see Applicants' Request for Partial Waivers Under the Newly Adopted SEC Rules.

*c. All transformers shall be transported off-site; and*

The Project will require the installation of transformers at the converter terminal and at the SVC in Deerfield. Should the Project be decommissioned, the Applicants will remove all transformers from the Site.

*d. All underground infrastructure at depths less than four feet below grade shall be removed from the site and all underground infrastructure at depths greater than four feet below finished grade shall be abandoned in place;*

Please see the Applicants' Request for Partial Waivers Under the Newly Adopted SEC Rules.

*(3) A plan for fire safety prepared by or in consultation with a fire safety expert;*

The Applicants refer the SEC to Northern Pass Project—Fire Safety Design Basis, Appendix 50 in the first instance.

The Applicant does not, in the ordinary course of business, develop specific fire safety plans for its individual ROWs. Electric transmission substations and ROWs are typically unoccupied during operation, so there are no personnel to evacuate. Any fire that might occur at a substation or the ROW once the Project is in operation would be initially addressed by the local fire department; the Applicants will respond pursuant to their Electric Operations Emergency Response Plan, provided in 301.08(c)(4).

During construction, emergency response (including response to fires) will be documented daily on the tailboard and addressed daily at the morning safety meeting. Neither NPT nor Eversource plans to engage in live line construction on this Project; therefore, the work presents no fire safety hazards beyond those typically associated with construction projects. If a

fire breaks out on the ROW while workers are present (either during construction or during future maintenance activities), workers would evacuate to the muster point established at the daily tailboard session and call the local fire department.

*(4) A plan for emergency response to the proposed facility site; and*

Please see Attachment 10 for Eversource's New Hampshire Electric Operations Emergency Response Plan, dated March 5, 2015. The elements of this plan that address transmission facility events would be used to respond in the event of an emergency affecting the Project.

> *(5) A description of any additional measures taken or planned to avoid, minimize, or mitigate public health and safety impacts that would result from the construction and operation of the proposed facility, and the alternative measures considered but rejected by the applicant.*

As described in Section 301.03(i)(6) of the Application, the Applicants have taken, and will continue to take, preventative steps to protect the health and safety of workers and the public during the construction and subsequent operation of the Project. The Applicants have designed the Project to adhere to company polices and the National Electrical Safety Code ("NESC") requirements for transmission lines and have optimized the design of the proposed phase conductors to minimize levels of magnetic fields at the ROW edge. The avoidance and minimization methods chosen by the Applicants are the best practical measures.

***Site 301.09 Effects on Orderly Development of Region.*** *Each application shall include information regarding the effects of the proposed energy facility on the orderly development of the region, including the views of municipal and regional planning commissions and municipal governing bodies regarding the proposed facility, if such views have been expressed in writing, and master plans of the affected communities and zoning ordinances of the proposed facility host municipalities and unincorporated places, and the applicant's estimate of the effects of the construction and operation of the facility.*

See Attachment 11, *Summary of Written Municipal and Regional Comments submitted to SEC* after the date of the new route announcement summarizing municipal comments that have not separately been submitted to the SEC.