



**ANNUAL REPORT
TO THE PUBLIC UTILITY COMMISSION &
PUBLIC SERVICE DEPARTMENT**

February 5, 2019

INTRODUCTION

In accordance with the Memorandum of Understanding (MOU) approved by the Public Utility Commission in Docket 7081 as amended¹, this document comprises the annual report of the Vermont System Planning Committee (VSPC) detailing activities undertaken in 2018.

Among its provisions, the Docket 7081 MOU requires that the VSPC report to the Public Utility Commission (PUC or Board) and Public Service Department (PSD) by February 15 of each year and post that report on the VSPC website. The report must consist of at least the following:

89. A report on each Reliability Deficiency identified to date in the [Long-Range Transmission] Plan or through the process described in Steps 1 through 6, above, including:
 - i. The status of NTA [Non-Transmission Alternative] Analysis for the Reliability Deficiency.
 - ii. The status of decision-making on the selection of alternative(s) to address the Reliability Deficiency.
 - iii. The status of decision-making on the allocation of costs of the alternative to address the Reliability Deficiency.
 - iv. The strategy chosen for implementing the alternative selected to address the Reliability Deficiency.

¹ Investigation into Least-Cost Integrated Resource Planning for Vermont Electric Power Company Inc.'s Transmission System. Amended 1/30/2012, 8/1/2012 & 11/6/2013 & Docket 8875 Order of 6/13/2018.

- v. The status of implementation of the alternative(s) to address the Reliability Deficiency.
 - vi. All documentation pursuant to paragraph 86, above, relating to advisory votes within the preceding calendar year.²
90. A statement of the dates and locations of all VSPC meetings held during the preceding year.³

In 2014, the Commission approved a recommendation by the VSPC, designed to harmonize reporting procedures, that the VSPC annual report incorporate annual utility updates on areas that have been approved for energy efficiency geographical targeting.⁴ At this time, no area of the state is approved for energy efficiency geographic targeting so no such annual utility updates are provided for the current year.

This document represents the VSPC annual report on the status of transmission and non-transmission analysis, solution selection, cost allocation, and implementation planning of all identified reliability deficiencies as required by the MOU, as well as the meetings and organizational work of the VSPC during 2018.

VSPC ACCOMPLISHMENTS, MEETINGS AND PROCESS

The past year was the eleventh full year of VSPC operation. During this year, the major activities and accomplishments of the Committee included:

- Received regular briefings each quarter from lead utilities on all reliability deficiencies identified in the Vermont Long-Range Transmission Plan (2015 plan in effect until July 1, 2018, when the 2018 update was published).
- Provided input to Vermont Electric Power Company (VELCO) in its draft of the 2018 Vermont Long-Range Transmission Plan in the preparation of the draft and through the two-month VSPC review process specified in the MOU, prior to release of the public draft. Provided feedback on the outreach process on the public review draft.
- Developed, and filed on October 29, 2018, the annual geographic targeting recommendations to the Commission. The Geographic Targeting Subcommittee developed the recommendations following a full review of transmission and subtransmission issues, as established in Docket 7081, and distribution issues, as established in Docket 7873/7874.

² ¶ 86 requires the VSPC to take advisory votes to resolve disputes regarding determinations of affected utilities and cost allocation.

³ Docket 7081 MOU at 35-36.

⁴ Docket EEU-2013-11, In re: VSPC Geographic Targeting Improvement Analysis, 1/24/2014.

- Received regular briefings on a variety of current project and policy proceedings, such as the standard offer program review (Case 17-5257), the investigation into promoting the ownership and use of electric vehicles (Case 18-2660), the PSD workshop on utility rate regulation (Case 17-3142), the Vermont Weather Analytics Center, merchant transmission in New England, cyber security, and the Regional Utility Group.
- Heard presentations on a wide variety of energy-related initiatives, studies and reports. Presenters included ISO-New England, Energy Action Network, Energy Futures Group and VELCO. Presentation topics included implementation of revised IEEE standard 1547, VWAC collaboration with Utopus Insights, progress report on Vermont’s Comprehensive Energy Plan, Renewable Energy Standard Tier 3 implementation, and proposed merchant transmission projects.
- Updated participants regularly on significant policy developments at ISO-NE, the Federal Energy Regulatory Commission (FERC) and the North American Electric Reliability Corporation (NERC) through regular meeting participation by an ISO New England (ISO-NE) representative, and briefings by VELCO. Topics of particular focus included: approval of Competitive Auctions with Sponsored Policy Resources (CASPR), FERC Order 841 compliance (storage), and winter fuel security.
- Provided input to VELCO on its study of the Sheffield Highgate Export Interface (SHEI) area. That study⁵ provided the incremental export capacity increases that can be achieved by a variety of potential grid constraint solutions, which would reduce curtailments of currently installed generation. Received regular briefings each quarter from the SHEI Solutions working group⁶ on the evaluation of potential grid constraint solutions, and the process for selecting the preferred solutions.
- Continued discussion of what changes to the Docket 7081/VSPC process may be warranted by significant changes that have taken place in the planning process, electric grid and energy-related public policy since the process was established in 2007. These discussions will continue in 2019.

The VSPC held the following full committee meetings during 2018:

1/24/2018	Quarterly meeting, South Burlington, VT
4/25/2018	Quarterly meeting, Middlebury, VT
7/18/2018	Quarterly meeting, Montpelier, VT
10/17/2018	Quarterly meeting, Rutland, VT

The subcommittees of the VSPC met throughout the year as follows:

⁵ The VELCO SHEI study and additional SHEI information can be found at <https://www.vermontspc.com/grid-planning/shei-info>

⁶ The SHEI Solutions working group is led by GMP, and includes VELCO, VPPSA, VEC, WEC, and BED, with the Department of Public Service joining the group last December.

- Coordinating Subcommittee: The Coordinating Subcommittee met by phone January 12, April 5, July 9, and October 2 to plan the agendas for quarterly VSPC meetings.
- Forecasting Subcommittee: The Forecasting Subcommittee met on November 8 to begin developing the work plan for collaboration on the next statewide load forecast.
- Geographic Targeting Subcommittee: The Geographic Targeting Subcommittee met on June 19. The group carried out its responsibilities for receiving reports from Vermont’s electric utilities and reviewing all current load growth-related reliability issues. This review formed the basis for drafting the VSPC’s geographic targeting recommendations and recommendations on the need for reliability plans in accordance with Docket 7873/7874, which was filed with the Commission on October 29, 2018.

The calendar of all VSPC meetings is posted on the VSPC website at:

<http://www.vermontspc.com/calendar>

Agendas and meeting minutes for the full VSPC meetings are posted on the VSPC website at:

<http://www.vermontspc.com/vspc-at-work/meetings>

Subcommittee agendas and meeting minutes are posted on the VSPC website at:

<http://www.vermontspc.com/vspc-at-work/subcommittees>

No advisory votes were taken in 2018.

REPORT ON IDENTIFIED RELIABILITY DEFICIENCIES

Paragraph 51 of the Docket 7081 MOU requires that the VSPC, VELCO and the distribution utilities report progress on identified reliability deficiencies at least annually to the Commission. In past years, this portion of the report has included several sections detailing the status of transmission and subtransmission issues identified in the currently applicable Vermont Long-Range Transmission Plan. This year, however, the current plan, published in July 2018, identifies no reliability deficiencies, due to declining loads, and increased distributed generation and energy efficiency. Consequently, this report is briefer than in the past, addressing only a single open issue.

One distribution issue in Hinesburg is currently under review, as detailed in the reliability plan filed with the Commission on October 1, 2016. The following section provides an update on the Hinesburg distribution issue that is the focus of that reliability plan, as required by the Docket 7873/7874 Screening Framework and Guidelines for Implementation of 30 V.S.A. § 8005a(d)(2).

DISTRIBUTION ISSUES THAT ARE THE FOCUS OF RELIABILITY PLANS

HINESBURG

GMP has identified a distribution system constraint in the Hinesburg area for which it filed a reliability plan on October 1, 2016. GMP customers in the Town of Hinesburg are served by an eight-mile-long distribution line, the 28G2, which originates at the GMP Charlotte substation. The load concentration in Hinesburg, together with its distance from the Charlotte substation, results in potential thermal overloads, voltage limitations, and challenges to adequately protect the distribution line for contingencies. While GMP has identified a solution to the existing protection issues, a number of issues remain, including the potential for future load growth, voltage constraints, high solar penetration, and motor start limitations. GMP analyzed a number of possible solutions to address the long-term reliability needs of the Hinesburg area. These solutions were considered in combination with the goal of producing a robust, cost-effective, long-term solution for the area. The potential solutions include: a new GMP substation; a new or upgraded substation with the Vermont Electric Cooperative (VEC); distance relaying; distributed generation; energy efficiency; and battery energy storage.

Based on its analysis, GMP plans to install a battery energy storage system (BESS) in the Hinesburg area while participating with VEC in a new or upgraded substation. A BESS, in conjunction with a substation, provides GMP with a flexible solution that allows it to defer certain transmission and distribution infrastructure investments, while likely proving to be the lowest cost solution to area deficiencies. GMP is committed to constructing additional storage facilities on its electric system to obtain multiple benefit streams, including reduced power and transmission expenses, deferral of transmission and distribution projects, reduced power supply risk, and enhanced resiliency. The Hinesburg area provides a particular opportunity for GMP to gain insights into the costs and effectiveness of a BESS solution in addressing an actual reliability deficiency. The Hinesburg area reliability deficiencies include multiple facets of interest, including high solar penetration and a relatively weak distribution system with limited capacity for future growth. GMP has stated that, given the inherent advantages of battery storage modularity, a battery solution in this area will effectively address uncertainties surrounding load growth and solar penetration while providing insights on the ability of storage solutions to address reliability needs. The actual timing of the BESS has not been determined. GMP will continue to monitor area load growth and is investigating opportunities for land purchase for the future BESS.

In 2018, GMP became aware of a potential Tier III⁷ strategic electrification opportunity in Hinesburg that would remove large gravel pit motors from local diesel generation and interconnect these loads onto the 28G2. Analysis indicates that, while the 28G2 could reliably serve these new loads, voltage flicker due to motor starts is a concern. To address this concern, in 2019 GMP will install a dynamic volt-ampere reactive compensation device (DVAR) on the 28G2. A DVAR uses power electronics to rapidly inject precise amounts of reactive power onto a distribution feeder to support motor starting and avoid excessive voltage flicker. This will be the first DVAR installed on the GMP system and will provide GMP with further insights on methods to enhance distribution system capabilities while deferring large capital investments.

⁷ Act 56 of the Vermont Legislature, enacted in June 2015, established renewable energy standard requirements for Vermont electric distribution utilities utilizing three categories, or Tiers. Tier III requirements are met either through additional new distributed energy resources, or as illustrated here, through energy transformation projects that reduce fossil fuel consumption.