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# VERMONT SYSTEM PLANNING COMMITTEE

## ANNUAL REPORT TO THE PUBLIC SERVICE BOARD AND PUBLIC SERVICE DEPARTMENT

JANUARY \_\_, 2010

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### INTRODUCTION

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In accordance with the Memorandum of Understanding (MOU) approved by the Public Service Board in Docket 7081<sup>1</sup>, this document comprises the 2010 annual report of the Vermont System Planning Committee (VSPC).

Among its provisions, the Docket 7081 MOU requires, annually by January 15, commencing in 2008, that the VSPC provide a report to the Public Service Board (PSB or Board) and Department of Public Service (DPS), and post the report on the VSPC website, consisting of at least the following:

89. A report on each Reliability Deficiency identified to date in the 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.
  - v. The status of implementation of the alternative(s) to address the Reliability Deficiency.

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<sup>1</sup> Investigation into Least-Cost Integrated Resource Planning for Vermont Electric Power Company, Inc.'s Transmission System.

- vi. All documentation pursuant to paragraph 86, above, relating to advisory votes within the preceding calendar year.<sup>2</sup>
- 90. A statement of the dates and locations of all VSPC meetings held during the preceding year.<sup>3</sup>

This document represents the 2010 VSPC annual report. It reports 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 2009.

## VSPC MEETINGS AND PROCESS

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The past year was the second full year of VSPC operation. It represented an important milestone in the Docket 7081 process: the commencement of the first full planning cycle under the MOU, which was initiated by the issuance of VELCO's draft three-year update of the 20-year *Long-Range Transmission Plan* (the Plan),

In January and February, the VSPC reviewed and provided input on the VSPC review draft of the Plan. VELCO incorporated VSPC input and issued a public review draft of the plan in April, 2009. A public engagement process to gather input on the plan included six public meetings held around the state, and other means for comment. VSPC members advised on the process and served as resources at the public meetings. The final plan, incorporating the public input, was filed with the Board by July 1, 2009. The VSPC began work in the fall on the Project Priority List and the final assignment of affected and lead utilities for dealing with the reliability deficiencies identified in the 2009 Plan. The resulting Project Priority List is expected to be filed in the first quarter of 2010.

During 2009, the VSPC completed the following work<sup>4</sup>:

- 1/26/2009 Filed *VSPC Annual Report* with PSB.
- 3/25/2009 Workshop for VSPC to update the PSB on progress to date.
- 12/21/2009 Filed *Evaluation of the Docket 7081 Planning Structure* with the PSB.

The VSPC held the following full committee meetings during 2009:

- 2/23/2009 Special meeting to discuss VELCO's draft *Long-Range Transmission Plan*, South Burlington.
- 3/11/2009 Regular quarterly meeting, Randolph.
- 6/10/2009 Regular quarterly meeting, Montpelier.

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

<sup>3</sup> Docket 7081 MOU at 35-36.

<sup>4</sup> All VSPC filings and products referenced in this report are posted at <http://www.vermontspc.com/VSPC%20Reports%20%20Correspondence/Forms/AllItems.aspx> unless otherwise noted.

9/9/2009	Regular quarterly meeting, Rutland.
9/30/2009	Special meeting to discuss regional funding of non-transmission alternatives with Stephen Rourke, Vice President for System Planning, ISO-New England, Montpelier.
10/21/2009	Special workshop meeting to review the draft <i>Evaluation of the Docket 7081 Planning Structure</i> , Montpelier.
12/9/2009	Regular quarterly meeting, South Burlington.

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

- Energy Efficiency & Forecasting Subcommittee: Met frequently during 2009 during the preparation of Efficiency Vermont's Forecast 20 and to address other items in its work plan. Meetings were held February 6, June 4, July 28, August 28, November 12, November 18 and November 24. The subcommittee's work resulted in a high level of communication among utility personnel, VELCO planners, EVT and DPS concerning forecasting.
- Generation Subcommittee: The Generation Subcommittee meet on July 27.
- Procedures Subcommittee: The Procedures Subcommittee spent much of 2009 addressing issues related to Critical Energy Infrastructure (CEII), particularly the development of a standard *Non-Disclosure Agreement* for the VSPC, pursuant to the *Information Protocol* filed by the VSPC with the Board in 2008. VELCO offered its own NDA in connection with the Plan, but the *VSPC Information Protocol* calls for the VSPC to develop and adopt an NDA to cover information necessary to the group's deliberations that is also CEII or otherwise confidential. Final action is expected on the NDA in early 2010. Procedures met on January 12, May 27, and October 21, and members conducted a number of additional conference calls to advance the issues under discussion.
- Public Participation Subcommittee: The Public Participation Subcommittee met several times during the year to advise on public outreach for draft Plan, gather input for the Docket 7081 process and consider develop strategies for increasing public participation and awareness in planning for transmission and non-transmission alternatives. The subcommittee met February 13, July 9 and October 16.
- Technical Coordinating Subcommittee: The Technical Coordinating Subcommittee met quarterly to plan the agendas for regular VSPC meetings and also convened a workshop meeting for all interested participants to hear the results of the Lyndonville project non-transmission alternatives screening. The subcommittee met January 12, February 12, March 4, May 27, August 25, August 27 and November 30.
- Transmission Subcommittee: The Transmission Subcommittee agendas focused on reviewing the St. Albans transmission analysis, developing the *Project Priority List* pursuant to the 2009 Plan, and providing input into the Docket 7081 evaluation. The subcommittee met August 3 and August 24.

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

<http://www.vermontspc.com/Lists/VSPC%20Calendar/List.aspx>

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

<http://www.vermontspc.com/VSPC%20Meetings/Forms/By%20Meeting.aspx>

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

<http://www.vermontspc.com/VSPC%20Meetings/Forms/By%20Meeting.aspx>

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## REPORT ON IDENTIFIED RELIABILITY DEFICIENCIES

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Paragraph 51 of MOU requires the VSPC to develop and submit to the Board a *Project Priority List* that includes dates for transmission analysis, NTA analysis, solution selection, cost allocation and implementation strategy. Initially the VSPC was operating under dates for these steps that had been established in Attachment F of the MOU. In June, 2008, however, the VSPC submitted its first Project Priority List, which had the effect, with Board approval<sup>5</sup>, of modifying the relevant dates and consolidating the timelines for all projects under one set of deadlines.

The MOU requires that the VSPC submit a *Project Priority List* to the PSB following each *Long-Range Transmission Plan* update, but does not provide a deadline for the filing. The VSPC began work in the summer of 2009 on the *Project Priority List* based on the 2009 *Plan* update, but final VSPC approval was not complete by the end of 2009. Paragraph 89 of the MOU requires a status report for each project in the *Priority List* adopted by the MOU. Consequently, the *Project Priority List* from the 2006 *Plan* remains in effect, and remains the basis for this annual report.

While the reporting below provides relevant information about compliance with established deadlines, it is not otherwise informative regarding the order of projects, which was significantly affected by the 2009 *Vermont Long-Range Transmission Plan* that was filed by VELCO with the Board on July 1, 2009. To provide a more relevant picture of the order of coming projects, VELCO's priority list that was published in the 2009 *Plan* update is attached to this report. We anticipate that the final *Project Priority List* adopted by the VSPC in early 2010 will differ only slightly from the attachment.

To reiterate for emphasis: **the following is based on the existing (but outdated) Project Priority List**, which remains in effect until the new list has been approved in early 2010.

### PRIORITY 1: SOUTHERN LOOP

Priority 1 includes the four deficiencies that will be addressed by the Coolidge Connector project, for which VELCO and Central Vermont Public Service (CVPS) have received a Certificate of Public Good (CPG). The project is currently under construction. The deficiencies to be addressed include:

- Loss of 115/46 kV transformers into Bennington or Brattleboro area would cause loss of significant load in Southern Vermont.
- Loss of the Vermont Yankee 345/115 kV autotransformer would place Brattleboro area load at high risk until a replacement transformer can be installed.

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<sup>5</sup> Docket 7081, Public Service Board order of 7/10/2008.



- Loss of the Vermont Yankee to Coolidge 345 kV line would cause significant voltage/thermal concerns.
- Loss of one Bennington 115/46 kV transformer would overload the other.

*REASON FOR PRIORITY:*

The priority level of these projects is based on the fact that a transmission solution to address the deficiencies is presently under consideration by the Public Service Board (PSB) for a CPG. In addition, these deficiencies affect a very large area of the state.

**PRIORITY 2: LOSS OF ESSEX TRANSFORMER**

Priority 2 includes one reliability deficiency that was considered in the Burlington Waterfront Area-Specific Collaborative (ASC), the Digital Injection ASC and the Tafts Corners ASC. The relevant reliability deficiency is:

- Loss of one Essex 115/34.5 kV transformer may overload the other (at a time when the McNeil generation plant is unavailable), with consequent load shedding.

The transmission solutions developed by the ASCs would each reduce load on the Essex transformers by either adding another source to the 34.5 kV network or by removing load from the 34.5 kV network to the Tafts Corner 115/12.5 kV radial transformers. The Burlington Waterfront ASC involves three phases:

- Phase 1: The East Avenue Loop. This project has been constructed and is in service.
- Phase 2: The Gorge Area Reinforcement. The project was granted a CPG on November 23, 2009, and is now in the process of construction planning.
- Phase 3: Upgrade of the Essex transformers.

The Digital Injection ASC and the Tafts Corners ASC involve the following three phases:

- Phase 1: Tafts Corner 115 kV substation construction.
- Phase 2: Addition of the first Tafts Corner 115/12.5 kV transformer. This project is in service.
- Phase 3: Addition of the second Tafts Corner 115/12.5 kV transformer.

These projects were split into multiple phases because there is a significant amount of time — five years or more — between the expected need dates of the first and last set of upgrades. This approach allows time for non-transmission alternatives potentially to postpone the latter phases.

	<u><b>Waterfront</b></u>	<u><b>Digital/Tafts</b></u>
<u>Transmission analysis</u>		
Phase 1	Completed	Completed
Phase 2	Completed	Completed
Phase 3	Completed, but revisit by 6/30/12 in	June 30, 2012



light of possible additional generation and geo-targeting

NTA screening/analysis

Phase 1	Completed	Completed
Phase 2	Completed	Completed
Phase 3	December 31, 2012	December 31, 2012

Solution selection, cost allocation & implementation strategy

Phase 1	Completed	Completed
Phase 2	Completed	Completed
Phase 3	March 31, 2013	March 31, 2013

**PRIORITY 3: LOSS OF ST. JOHNSBURY TRANSFORMER; VOLTAGE COLLAPSE/LOW VOLTAGE IN NORTHERN VT DUE TO LOSS OF TRANSMISSION AT EITHER END**

The following deficiencies will be addressed by the Lyndonville/St Johnsbury project.

- Loss of St. Johnsbury 115/34.5 kV transformer results in loss of all load at St. Johnsbury
- Low voltage or voltage collapse in northern Vermont for loss of transmission at either end

Transmission analysis Completed

NTA screening/analysis Completed

Solution selection, cost allocation & implementation strategy

- Solution selection Completed
- Implementation strategy & cost allocation Completed

**PRIORITY 4: NEW HAVEN TRANSFORMER; MIDDLEBURY TRANSFORMER**

The following deficiencies will be addressed by CVPS’s Middlebury project:

- Loss of the New Haven 115/46 kV transformer would result in unacceptable low voltages (loss of all load following completion of NRP).
- Loss of Middlebury 115/46 kV transformer would result in unacceptable low voltages locally.

Transmission analysis Completed

NTA screening/analysis\* Completed

Solution selection, cost allocation & implementation strategy

Completed

\*NTA screening was completed and presented to the VSPC at the September, 2008, quarterly meeting. CVPS determined by applying the VSPC NTA screening tool that NTAs are not viable alternatives to the transmission upgrade and, therefore, a full analysis will not be conducted. CVPS is conducting public outreach related to the project.

**PRIORITY 5: ST. ALBANS TRANSFORMER; EAST FAIRFAX TRANSFORMER; GEORGIA BREAKER FAILURE.**

The following deficiencies will be addressed by the St Albans/Georgia project:

- Loss of one St. Albans 115/34.5 kV transformer overloads the other.
- Loss of the St. Albans transformers with loss of the 115 kV line or the East Fairfax transformer causes local voltage collapse.
- Breaker failure at Georgia substation results in unacceptable voltage / thermal performance locally.

On December 19, 2008, CVPS filed a letter with the Board requesting an enlargement of time to address this deficiency as compared to the dates in the June 2008 Project Priority List. The enlargement was requested in light of information gleaned from the first draft of the 2009 update of the VELCO Long-Range Transmission Plan, which indicates the need for further coordination of planning between VELCO and CVPS. On August 25, 2009, CVPS filed an additional letter with the Board requesting a further enlargement of time. The table below shows the dates contained in the Project Priority List and the revised dates contained in CVPS's letters to the Board.

<i>Step</i>	<i>Dates in Project Priority List</i>	<i>Revised dates in 12/19/08 and 8/25/09 filings</i>
<u>Transmission analysis</u>	December 31, 2008	May 31, 2009, Completed
<u>NTA screening/analysis</u>	March 31, 2009	August 31, 2009, Completed
<u>Solution selection, cost allocation and implementation strategy.</u>	June 30, 2009	January 31, 2010

#### **PRIORITY 6: NORTH RUTLAND/COLD RIVER**

Loss of either the North Rutland or Cold River 115/46 kV transformer would overload the other unit with unacceptable low voltages locally. On December 22, 2009, CVPS made an informational filing with the Board regarding the time necessary to complete the transmission analysis and other steps associated with this project. The table below shows the dates contained in the *Project Priority List* and the revised dates contained in CVPS's letters to the Board.

<i>Step</i>	<i>Dates in Project Priority List</i>	<i>Revised dates in 12/22/08 filing</i>
<u>Transmission analysis</u>	April 30, 2009	June 30, 2010
<u>NTA screening/analysis</u>	April 30, 2010	December 31, 2010
<u>Solution selection etc.</u>	December 31, 2010	March 31, 2011

#### **PRIORITY 7: WEST RUTLAND, BLISSVILLE**

Loss of West Rutland - Blissville 115 kV line causes unacceptable low voltages locally. The 2008 Project Priority List calls for this reliability deficiency to be studied in the 2009 Long Range Transmission Plan and for dates to be established on the basis of that analysis.

#### **PRIORITY 8: HARTFORD TRANSFORMER**

Loss of the Hartford 115/46 kV transformer would cause unacceptable low voltages locally. The 2008 Project Priority List calls for this reliability deficiency to be studied in the 2009 Long Range Transmission Plan and for dates to be established on the basis of that analysis.



**PRIORITY 9: LOSS OF PV20 UNDERGROUND CAUSEWAY CABLE FROM  
APPLE TREE TO POLE 172**

The 2006 Long Range Transmission Plan described that the long term loss of PV20 underground causeway cable with many other outages can cause severe & widespread voltage / thermal concerns. The 2008 Project Priority List calls for this reliability deficiency to be studied in the 2009 Long Range Transmission Plan and for dates to be established on the basis of that analysis.

**PRIORITY 10: ASCUTNEY BREAKER FAILURE**

Breaker failure at Ascutney substation results in unacceptable voltage / thermal performance locally. The 2008 Project Priority List calls for this reliability deficiency to be studied in the 2009 Long Range Transmission Plan and for dates to be established on the basis of that analysis.

**PRIORITY 11: COOLIDGE TRANSFORMER**

Long term loss of Coolidge 345/115 kV transformer causes voltage and thermal concerns in Central Vermont. The 2008 Project Priority List calls for this reliability deficiency to be studied in the 2009 Long Range Transmission Plan and for dates to be established on the basis of that analysis.

**PRIORITY 12: BARRE TO BERLIN; FLORENCE TO WEST RUTLAND;  
COLD RIVER TO NORTH RUTLAND**

The following deficiencies occur at the same load level, and are similar.

- Overload of the Barre to Berlin 115 kV line
- Overload of the Florence to West Rutland 115 kV line
- Overload of the Cold River to North Rutland 115 kV line

The 2008 Project Priority List calls for these reliability deficiencies to be studied in the 2009 Long Range Transmission Plan and for dates to be established on the basis of that analysis.

**PRIORITY 13: NEW HAVEN TO WILLISTON**

The New Haven to Williston 115 kV line could overload when the parallel 115 kV line trips. The 2008 Project Priority List calls for this reliability deficiency to be studied in the 2009 Long Range Transmission Plan and for dates to be established on the basis of that analysis.

**PRIORITY 14: WILLISTON TO TAFTS CORNERS; BARRE TO BERLIN;  
BERLIN TO MIDDLESEX**

The following deficiencies occur at the same load level, and are similar.

- Loss of the Williston to Tafts Corners 115 kV line, with heavy flows from south to north, overloads the Queen City 115/34.5 kV transformer
- Loss of the Barre to Berlin 115 kV line section, when heavily loaded from east to west, overloads the Barre transformer

- Loss of the Berlin to Middlesex 115 kV line section, when heavily loaded from east to west, overloads the Berlin transformer

GMP has proposed to address these deficiencies by opening the 34.5 kV subtransmission network at appropriate locations. The deficiencies will need to be re-evaluated periodically to determine whether the proposed operating actions will continue to be acceptable. This is primarily a subsystem concern. However, sectionalizing of sub-transmission lines may result in a transmission overload, unacceptable transmission voltage or an exhaustion of transmission reactive resources sometime in the future. No transmission analysis, NTA screening/analysis, solution selection, cost allocation or implementation strategy is necessary for this deficiency at this time.

2009 Vermont Long-Range Transmission Plan

Figure 4-5. Proposed transmission project details (the cost estimates are in year 2008 millions of dollars).

Priority number	Name	Year of Need	Load MW Needed	Low Cost	High Cost	Project Type	Deficiencies	Project	Affected DUs	Lead DU
1	St. Johnsbury	2009	400	\$ 22	\$ 22	Substation	10	Construct new ring substation at or near Lyndonville substation, install capacitor banks	CVPS, LED for station. CVPS, LED & VEC for capacitor banks	LED
2	Middlebury	2009	700	\$ 10	\$ 20	Substation	2	Install 2nd 115/46 kV transformer, rebuild to ring station. (Note: CVPS is pursuing an alternative transmission solution to resolve this deficiency.)	CVPS	CVPS
3A	St. Albans	2009	900	\$ 25	\$ 50	Substation	1	Construct new ring station with two 115/34.5 kV transformers	CVPS, VEC	CVPS
3B	Georgia	2009	1100	\$ 20	\$ 40	Substation	1	Rebuild to ring station	All Vermont DUs	CVPS
3C	Georgia–St. Albans	2018	1275	\$ 15	\$ 30	Transmission	1	Construct new Georgia to St Albans 115 kV transmission line, under 10 miles. <b>Needed before 2018.</b>	All Vermont DUs	VEC
4	South Rutland	2009	1000	\$ 15	\$ 30	Substation	5	Construct new substation with a 115/46 kV transformer	CVPS	CVPS
5	Blissville	2009	800	\$ 15	\$ 30	Substation	3	Install 2nd 115/46 kV transformer, rebuild to ring station, install capacitor banks	CVPS	CVPS
6	Hartford	2009	1000	\$ 15	\$ 30	Substation	4	Install 2nd 115/46 kV transformer, rebuild to ring station	CVPS, GMP	CVPS
7	Ascutney	2009	<1170	\$ 14	\$ 28	Substation	6	Rebuild to breaker-and-a-half station	All Vermont DUs, NU, NGRID	CVPS
8A	Newport	2009	1000	\$ 1	\$ 2	Substation	10	Install capacitor banks	All Vermont DUs	VEC
8B	Queen City	2009	<1170	\$ 2	\$ 4	Substation	8	Install capacitor bank	All Vermont DUs, NGRID	GMP
8C	West Rutland	2009	<1170	\$ 6	\$ 12	Substation	8, 9	Install capacitor banks and shunt reactors	All Vermont DUs, NGRID	CVPS
8D	Ascutney	2009	<1170	\$ 2	\$ 4	Substation	6	Add capacitor banks	All Vermont DUs, NU, NGRID	CVPS
8E	Coolidge Reactor	2011	1200	\$ 4	\$ 8	Substation	9	Install shunt reactor	All Vermont DUs, NU, NGRID, NY	CVPS

2009 Vermont Long-Range Transmission Plan

Priority number	Name	Year of Need	Load MW Needed	Low Cost	High Cost	Project Type	Deficiencies	Project	Affected DUs	Lead DU
9	Coolidge-Ascutney	2009	N/A	\$ 25	\$ 50	Transmission	12	Rebuild transmission line to higher rating, under 15 miles	All Vermont DUs, NU, NGRID	GMP
10	Yankee-Vernon Rd	2009	<1170	\$ 5	\$ 10	Transmission	11	Rebuild line for higher rating, under 10 miles	All Vermont DUs, NU, NGRID	CVPS
11	Vernon	2010	1185	\$ 15	\$ 30	Substation	14	Install 2nd 345/115 kV transformer	All Vermont DUs, NU, NGRID	CVPS
12	Ascutney-Ascutney Tap	2013	1210	\$ 5	\$ 10	Transmission	13	Rebuild transmission line to higher rating, under 10 miles	All Vermont DUs, NU, NGRID	CVPS
13	Coolidge-Cold River	2013	1210	\$ 35	\$ 70	Transmission	15	Rebuild transmission line to higher rating, under 20 miles	All Vermont DUs, NY	CVPS
14	Bennington	2009	<1170	\$ 10	\$ 20	Substation	7	Rebuild to ring substation, install capacitor banks	All Vermont DUs, NGRID	CVPS
15	Ascutney Transformer	2013	1210	\$ 6	\$ 12	Substation	6	Install 2nd 115/46kV transformer	CVPS, Ludlow for station	CVPS
16	Coolidge Transformer	2016	1245	\$ 20	\$ 40	Substation	16	Install 2nd 345/115 kV transformer	All Vermont DUs, NU, NGRID, NY	CVPS
17	Barre	2018	1275	\$ 10	\$ 20	Substation	19	Install 2nd 115/34.5 kV transformer and rebuild to ring station. <b>2018 assumes there will be an upgrade to the 34.5 kV system</b>	GMP, WEC	GMP
18	Chelsea	2018	1275	\$ 15	\$ 30	Substation	4	Install 2nd 115/46 kV transformer, rebuild to ring station	CVPS, WEC	CVPS
19	Plattsburgh-Essex	2021	N/A	\$ 200	\$ 300	Transmission	21, 22, 23	Construct new Plattsburgh to Essex 230 kV transmission line, parallel with existing 115 kV lines, under 30 miles. <b>NOTE: timing may be 2016 or earlier depending on other possible scenarios</b>	All Vermont DUs	GMP
				\$512	\$902					
TOTAL				\$512	\$902					

\* R&J = Readsboro and Jacksonville