Vermont System Planning Committee

Project Priority List

A list of electric reliability deficiencies, when they are projected to occur and the timing of efforts to address them

A report to the Public Service Board
prepared in compliance with Paragraph 51 of the
Memorandum of Understanding in Docket 7081

June 20, 2008

VSPC PROJECT PRIORITY LIST

A LIST OF ELECTRIC RELIABILITY DEFICIENCIES, WHEN THEY ARE PROJECTED TO OCCUR AND THE TIMING OF EFFORTS TO ADDRESS THEM

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A LIST OF ELECTRIC RELIABILITY DEFICIENCIES, WHEN THEY ARE PROJECTED TO OCCUR AND THE TIMING OF EFFORTS TO ADDRESS THEM

BACKGROUND

The Vermont System Planning Committee (VSPC) is required to adopt, and file with the Public Service Board, a prioritized list of identified electric system reliability deficiencies. This prioritized list must contain a schedule of dates for analyzing the deficiencies and determining solutions. Once the list is in place, utilities must adhere to its schedule or inform the Board of any deadlines they cannot meet.[1]

The Memorandum of Understanding establishing the VSPC[2] details the elements that must be included in the project priority list for each reliability deficiency, including:

a) The reason for the priority assigned to each reliability deficiency.
b) If the likely transmission solution has not yet been identified, the date by which the analysis of the transmission solution is proposed to be completed.
c) The date by which analysis of non-transmission alternatives (NTAs) is proposed to be completed.
d) The date by which a decision will be made concerning solution selection, implementation strategy, and cost allocation.

This document comprises the project priority list of the VSPC. The list serves multiple purposes: laying out the work of the VSPC for the next several years; providing the public with a tool, in addition to the VSPC annual report and the VELCO Long-Range Transmission Plan, for understanding where reliability deficiencies are projected to occur prior to the planning of specific transmission projects or non-transmission alternatives; and keeping regulators apprised of the work that is anticipated and its schedule.

[1] The complete text of paragraph 51 is as follows: Following the filing of a Plan under 30 V.S.A. § 218c(d), and given a proposal from the Affected Utilities, the VSPC will create a priority list concerning Reliability Deficiencies identified in the Plan, which list shall be promptly filed with the Board for its information along with any comments from VSPC participants. For each Reliability Deficiency included on the list, the filing shall at a minimum state: (a) the reason for the priority assigned to the deficiency; (b) if no likely Transmission solution has yet been identified, the date by which further analysis of Transmission solutions to the deficiency is proposed to be completed; (c) the date by which NTA analysis is proposed to be completed; and (d) the date by which a decision will be made concerning solution selection, implementation strategy, and cost allocation. Upon filing by the VSPC, the NTA Analysis and decisions on solution selection, implementation strategy, and cost allocation for the subject Reliability Deficiencies shall be made in accordance with the dates contained on the filed priority list unless the Board directs otherwise. Subsequent to such filing, the Affected Utility or Utilities may make another informational filing to the Board to extend a deadline contained therein, stating the new deadline and the reason for the extension. The Department, all other participants in the VSPC, and all Parties shall be provided notice and a copy of the filing at the time priority lists or extensions thereof are submitted under this paragraph. At any time, any participant in the VSPC or Party may request Board review of whether such a priority list or extension should be modified, and the Board may initiate such review on its own motion.

[2] Memorandum of understanding in Vermont Public Service Board Docket 7081, approved by the Board on 6/20/07. http://www.state.vt.us/psb/orders/2007/files/7081mouwithattachments.pdf

ORGANIZATION OF THE LIST

The list is organized in priority order from highest priority, i.e., most immediate projected need, to lowest priority, i.e., longest-range projected need. Some reliability deficiencies are grouped together in the same priority because they may be addressed by a common solution.

According to the terms of the Memorandum of Understanding in Docket 7081 (MOU), the priority list is meant to address reliability deficiencies that were identified in the 2006 VELCO Long-Range Transmission Plan (LRTP). Although, the Gorge Area Reinforcement project and the Tafts Corner Phase II project were not explicitly mentioned in the 2006 Plan, they are included in the Essex transformer Reliability Deficiency because they help mitigate this deficiency. Therefore, these two projects are incorporated into the list with the same priority level as other projects related to the Essex Reliability Deficiency.

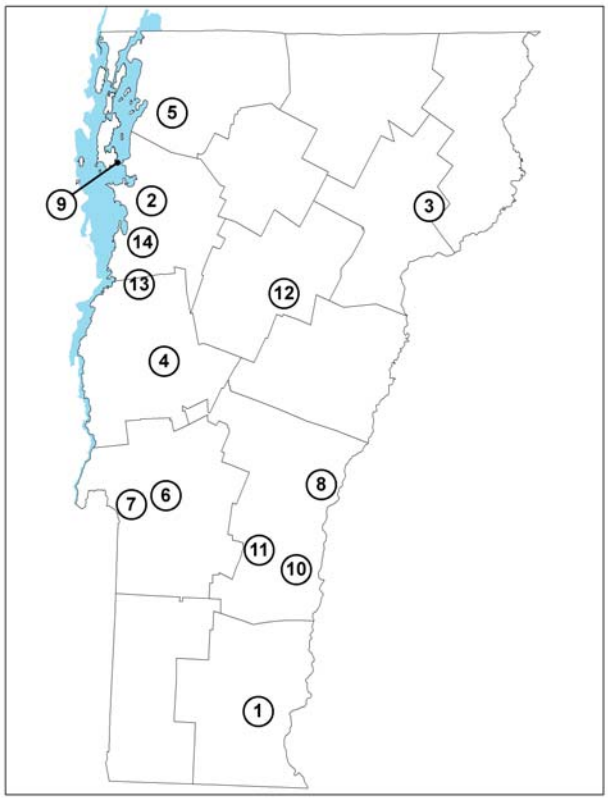
As noted in the MOU, VELCO will be responsible for performing transmission and NTA analyses for bulk and primarily bulk system deficiencies. For subsystem or primarily subsystem deficiencies, the Affected Utilities are responsible for performing these studies.

This report also includes: a table version of the priorities and deadlines contained herein; a Gantt chart showing the relationship of the timelines for the priorities; and a key to acronyms.

APPROXIMATE LOCATION OF RELIABILITY DEFICIENCIES BY PRIORITY

The following map shows the rough location of the priorities included in the list. To the right of the map is a list of the projects with hyperlinks to the description of the priority that appears in this document. Further description of the listed reliability deficiencies is available in the 2008 VSPC Annual Report:
http://www.vermontspc.com/VSPC%20Reports%20%20Correspondence/AnnualReport2008final.pdf .

Approximate location of Reliability Deficiencies by assigned priority



Priority 1: Southern Loop

Priority 2: Loss of Essex transformer

Priority 3: Loss of St. Johnsbury transformer; Voltage collapse/low voltage in northern VT due to loss of transmission at either end

Priority 4: New Haven transformer; Middlebury transformer

Priority 5: St. Albans transformer; East Fairfax transformer; Georgia breaker failure.

Priority 6: North Rutland/Cold River

Priority 7: West Rutland, Blissville

Priority 8: Hartford transformer

Priority 9: Loss of PV20 underground causeway cable from Apple Tree to pole 172

Priority 10: Ascutney breaker failure

Priority 11: Coolidge transformer

Priority 12: Barre to Berlin; Florence to West Rutland; Cold River to North RutlandPriority 1: Southern Loop

Priority 13: New Haven to Williston

Priority 14: Williston to Tafts Corners; Barre to Berlin; Berlin to Middlesex

A NOTE ABOUT HOW RELIABILITY DEFICIENCIES ARE IDENTIFIED

The electric power delivery system is highly regulated and subject to design standards – called "reliability standards" – intended to ensure that the system continues to operate under a wide range of circumstances and events. To maintain compliance with these reliability standards, utility engineers and planners evaluate or test how the system is likely to behave under various scenarios of consumer use, and contingencies involving failures or outages of system components (such as generators, lines, circuit breakers, and switches). A "reliability deficiency" exists if these tests show that the emergency capacity of a system component will be inadequate during an unplanned event (called a contingency), or projected demand for power exceeds a facility's designed capacity. The reliability deficiencies in this report, identified through the planning process, are likely to cause the system to be out of compliance with one or more system design standards.

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) applied for a Certificate of Public Good (CPG) from the Public Service Board in November 2007. The review process is underway in Docket 7373. 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.
- 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.

COMPLETION DATE OF TRANSMISSION ANALYSIS:	The transmission analysis was completed prior to the filing of the application for a Certificate of Public Good.
COMPLETION DATE OF NTA SCREENING/ANALYSIS:	The NTA analysis is completed.
EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:	Decisions for solution selection, implementation strategy, and cost allocation were made.

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 received a Certificate of Public Good.
- Phase 2: The Gorge Area Reinforcement. This project is expected to be submitted to the Public Service Board to obtain a Certificate of Public Good by July 2008.
- 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 expected to be submitted to the Public Service Board to obtain a Certificate of Public Good in July 2008.
- 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 to postpone the latter phases.

REASON FOR PRIORITY:

The priority level of these projects is based on the fact that transmission solutions for the initial phases are either in permitting or about to be in permitting. In addition, a large amount of load is at risk in the greater Burlington area served by the Burlington Electric Department, Green Mountain Power and Vermont Electric Cooperative.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

	Waterfront	**Digital/Tafts**
A: Transmission analysis		
Phase 1	Completed	Completed
Phase 2	Completed	Completed
Phase 3	Completed, but revisit by 6/30/12 in light of possible additional generation and geo-targeting	June 30, 2012
B: NTA screening/analysis		
Phase 1	Completed	Completed
Phase 2	May 31, 2008	May 31, 2008
Phase 3	December 31, 2012	December 31, 2012
C: Solution selection etc.		
Phase 1	Completed	Completed
Phase 2	June 15, 2008	June 15, 2008
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 that is expected to be filed within a year.

- 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

REASON FOR PRIORITY:

These deficiencies are given a priority of 3 because the selected project will likely be the next project that is filed with the Board for section 248 approval following the Gorge Area Reinforcement and Tafts Corners Phase II. In addition, there is a large exposure to the first deficiency due to local system topology and insufficient voltage support. This is primarily a subsystem concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

A: Transmission analysis	May 31, 2008
B: NTA screening/analysis	October 31, 2008
C: Solution selection etc.	
-- Solution selection	November 30, 2008
-- Implementation & cost allocation	March 31, 2009

Priority 4: New Haven transformer; Middlebury transformer

The following deficiencies will be addressed by the Middlebury project that will be filed within a year.

- 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.

REASON FOR PRIORITY:

These deficiencies are given a priority of 4 because of the large exposure to these deficiencies. In addition, the selected project will be filed with the Board to seek a CPG in the next few months. This is primarily a subsystem concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

A: Transmission analysis	Completed
B: NTA screening/analysis*	Completed
C: Solution selection etc.	Completed

**NTA analysis has been completed by the utility and will be discussed by the VSPC prior to the end of 2008.*

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.

REASON FOR PRIORITY

These deficiencies are given a priority of 5 because they could occur at load levels as low as 850 MW. This is primarily a subsystem concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

A: Transmission analysis	December 31, 2008
B: NTA screening/analysis*	March 31, 2009
C: Solution selection etc.	June 30, 2009

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.

REASON FOR PRIORITY

This deficiency is given a priority of 6 because it could occur at load levels as low as 930 MW, and because of the amount of load affected. This is primarily a subsystem concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:

C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

A: Transmission analysis	April 30, 2009
B: NTA screening/analysis	April 30, 2010
C: Solution selection etc.	December 31, 2010

Priority 7: West Rutland, Blissville

Loss of West Rutland - Blissville 115 kV line causes unacceptable low voltages locally

REASON FOR PRIORITY

This deficiency is given a priority of 7 because it could occur at load levels as low as 920 MW. This is primarily a subsystem concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

This reliability deficiency will be studied in the 2009 Long Range Transmission Plan. Based on the results of that analysis, dates will be established.

Priority 8: Hartford transformer

Loss of the Hartford 115/46 kV transformer would cause unacceptable low voltages locally.

REASON FOR PRIORITY

This deficiency is given a priority of 8 because it could occur at load levels as low as 950 MW. This is primarily a subsystem concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

This reliability deficiency will be studied in the 2009 Long Range Transmission Plan. Based on the results of that analysis, dates will be established.

Priority 9: Loss of PV20 underground causeway cable from Apple Tree to pole 172

Long term loss of PV20 underground causeway cable with many other outages can cause severe & widespread voltage / thermal concerns.

REASON FOR PRIORITY

This deficiency is given a priority of 9 because it could occur at load levels as low as 1100 MW, and a significant amount of load could be affected. This is a bulk system concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

This reliability deficiency will be studied in the 2009 Long Range Transmission Plan. Based on the results of that analysis, dates will be established.

Priority 10: Ascutney breaker failure

Breaker failure at Ascutney substation results in unacceptable voltage / thermal performance locally.

REASON FOR PRIORITY:

This deficiency is given a priority of 10 because it could occur at the 1200 MW load level. This is primarily a bulk system concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

This reliability deficiency will be studied in the 2009 Long Range Transmission Plan. Based on the results of that analysis, dates will be established.

Priority 11: Coolidge transformer

Long term loss of Coolidge 345/115 kV transformer causes voltage and thermal concerns in Central Vermont.

REASON FOR PRIORITY:

This deficiency is given a priority of 11 because it could occur at the 1250 MW load level. This is primarily a bulk system concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

This reliability deficiency will be studied in the 2009 Long Range Transmission Plan. Based on the results of that analysis, dates will be established.

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

REASON FOR PRIORITY:

These deficiencies are given a priority of 12 because they could occur at the 1300 MW load level. This is primarily a bulk system concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

This reliability deficiency will be studied in the 2009 Long Range Transmission Plan. Based on the results of that analysis, dates will be established.

Priority 13: New Haven to Williston

The New Haven to Williston 115 kV line could overload when the parallel 115 kV line trips.

REASON FOR PRIORITY

This deficiency is given a priority of 13 because it could occur just beyond the 1300 MW load level. This is a bulk system concern.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

This reliability deficiency will be studied in the 2009 Long Range Transmission Plan. Based on the results of that analysis, dates will be established.

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

REASON FOR PRIORITY

These deficiencies were given a priority of 14 because GMP has proposed to address them by opening the 34.5 kV 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 sometime in the future.

A: COMPLETION DATE OF TRANSMISSION ANALYSIS:
B: COMPLETION DATE OF NTA SCREENING/ANALYSIS:
C: EXPECTED DATE OF A DECISION CONCERNING SOLUTION SELECTION, IMPLEMENTATION STRATEGY, AND COST ALLOCATION:

A: Transmission analysis	No analysis will be performed
B: NTA screening/analysis	No analysis will be performed
C: Solution selection etc.	No decisions are needed

TABLE VIEW OF RELIABILITY DEFICIENCIES, ANTICIPATED NEED, AFFECTED SYSTEM, STATUS AND PRIORITY

Reliability problem identified	Transmission solution examined in 2006 analysis	Load level need (estimated)	Year of need (estimate based on forecast)	Affected System	Corresponding Planning Study/Project	Address in VSPC	Status Update	Priority
Loss of St. Johnsbury 115/34.5 kV transformer results in loss of all load at St. Johnsbury	Install second 115/34.5 kV transformer at St. Johnsbury with requisite station expansion	400	2006	Sub-system	Lyndonville	Yes	Proposed load growth at Burke Mountain, fed off Lyndonville Electric, has resulted in a first draft (November 2007) of a Transmission Alternative Analysis.	3
Loss of the New Haven 115/46 kV transformer results in unacceptable low voltages (loss of all load following completion of NRP)	Install second 115/46 kV transformer at New Haven with requisite station expansion (or build Middlebury to New Haven 46 kV line)	700	2006	Sub-system	Middlebury	Yes	In Appendix F	4
Loss of 115/46 kV transformers into Bennington or Brattleboro area causes loss of significant load in Southern Vermont	Add West Dummerston substation on new line between Vermont Yankee to Coolidge. CVPS adds reactive supply in 46 kV system between Bennington to Brattleboro	760	2006	Sub-system	Southern Loop	Yes	In Appendix F	1
Loss of Middlebury 115/46 kV transformer causes unacceptable low voltages locally	Install second 115/46 kV transformer at Middlebury with requisite station expansion (or build Middlebury to New Haven 46 kV line)	760	2006	Sub-system	Middlebury	Yes	In Appendix F	4
Loss of Vermont Yankee 345/115 kV auto transformer places Brattleboro area load at high risk until replacement transformer installed	Install second Vermont Yankee 345 / 115 kV transformer with requisite station expansion	800	2006	Bulk system	Southern Loop	Yes	In Appendix F	1
Loss of one St. Albans 115/34.5 kV transformer overloads the other	Install two 50 MVA 115 / 34.5 kV transformers at St. Albans	850	2006	Sub-system	St. Albans	Yes	In Appendix F	5
Loss of West Rutland - Blissville 115 kV line causes unacceptable low voltages locally	Install 16.2 MVAR of capacitor banks at Blissville	920	2006	Sub-system	Not started	No	Will apply screening tool to determine if not applicable for VSPC since Capacitor Bank Installation	7
Loss of one Essex 115/34.5 kV transformer may overload the other (with McNeil unavailable), with consequent load shedding	Install larger transformers at Essex, or pursue other local solution to address transformer load distribution	920	2006	Sub-system	East Ave Loop	No	Previous ASC, 248 Permit Filed	2
Loss of either the North Rutland or Cold River 115/46 kV transformer overloads the other unit with unacceptable low voltages locally	Install second 115/46 kV transformer at North Rutland with requisite station expansion	930	2006	Sub-system	Not started	Yes	In Appendix F	6

Reliability problem identified	Transmission solution examined in 2006 analysis	Load level need (estimated)	Year of need (estimate based on forecast)	Affected System	Corresponding Planning Study/Project	Address in VSPC	Status Update	Priority
Loss of the St. Albans transformers with loss of the 115 kV line or the East Fairfax transformer causes local voltage collapse	Install old St. Albans transformers at new Milton station	950	2006	Sub-system	St. Albans	Yes	In Appendix F	5
Loss of the Hartford 115/46 kV transformer causes unacceptable low voltages locally	Install second 115/46 kV transformer at Hartford with requisite station expansion	950	2006	Sub-system	Not started	Yes	Will revisit in 2009 Study Cycle	8
Low voltage or voltage collapse in northern Vermont for loss of transmission at either end	Install reactive power device at Irasburg substation with requisite station expansion	1000	2006	Primarily Bulk system	Not started	Yes	May be addressed as part of Lyndonville Study	3
Breaker failure at Georgia substation results in unacceptable voltage / thermal performance locally	Rebuild Georgia station to 6 breaker ring bus	1100	2006	Primarily Bulk system	Georgia	Yes	Will be reviewed in relation to the St Albans project	5
Long term loss of PV20 underground causeway cable with many other outages can cause severe & widespread voltage / thermal concerns	Install 2nd parallel PV20 causeway underground cable	1100	2006	Bulk system	Not started	Yes	Will revisit in 2009 Study Cycle	9
Loss of the Vermont Yankee to Coolidge 345 kV line causes significant voltage / thermal concerns	Four alternatives considered - least cost option builds line parallel to Vermont Yankee - Coolidge line in same right of way (ROW) with expansions to two existing substations (Coolidge and Vermont Yankee) and addition of reactive power device at Coolidge	1200	2011	Bulk system	Southern Loop	No	In Appendix F	1
Overload of the Coolidge to Cold River 115 kV line	Rebuild Coolidge to Cold River 115 kV line	1200	2011	Bulk system	Not started	Yes	In Appendix F	12
Breaker failure at Ascutney substation results in unacceptable voltage / thermal performance locally	Improve Ascutney station from current radial bus configuration with 115 kV cap bank and 2nd 115 /46 kV transformer	1200	2011	Primarily Bulk system	Not started	Yes	Will revisit in 2009 Study Cycle	10
Loss of one Bennington 115/46 kV transformer overloads the other	Install two 75 MVA 115 / 46 kV transformers at Bennington	1200	2011	Sub-system	Southern Loop	No	In Appendix F	1
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	Install second 115/34.5 kV transformer at Queen City with requisite station expansion (or automatically sectionalize the underlying subtransmission network)	1200	2011	Primarily Bulk system	Not needed	No	These constraints have been addressed by a GMP protection scheme that automatically sectionalizes the 34.5 kV system. No upgrades needed at this time. Will revisit in	N/A
Loss of the Barre to Berlin 115 kV line section, when heavily loaded from east to west, overloads the Barre transformer	Install either a larger transformer or a second 115/34.5 kV transformer at Barre with any requisite station expansion (or automatically sectionalize the underlying network)	1200	2011	Primarily Bulk system	Not needed	No		N/A

Reliability problem identified	Transmission solution examined in 2006 analysis	Load level need (estimated)	Year of need (estimate based on forecast)	Affected System	Corresponding Planning Study/Project	Address in VSPC	Status Update	Priority
Loss of the Berlin to Middlesex 115 kV line section, when heavily loaded from east to west, overloads the Berlin transformer	Install a second 115/34.5 kV transformer at Berlin with any requisite station expansion (or automatically sectionalize the underlying subtransmission network)	1200	2011	Primarily Bulk system	Not needed	No	2009 Study Cycle.	N/A
Long term loss of Coolidge 345/115 kV transformer causes voltage / thermal concerns in central VT	Install second Coolidge 345 / 115 kV transformer with requisite station expansion	1250	2013	Bulk system	Southern Loop	Yes	In Appendix F	11
Overload of the Barre to Berlin 115 kV line	Rebuild Barre to Berlin 115 kV line	1300	2016	Bulk system	Not started	Yes	Will revisit in 2009 Study Cycle	12
Overload of the Florence to West Rutland 115 kV line	Rebuild the Florence to West Rutland 115 kV line	1300	2016	Bulk system	Not started	Yes	Will revisit in 2009 Study Cycle	12
Overload of the Cold River to North Rutland 115 kV line	Rebuild Cold River to North Rutland 115 kV line	1300	2016	Bulk system	Not started	Yes	Will revisit in 2009 Study Cycle	12
Overload of New Haven to Williston 115 kV line	Rebuild New Haven to Williston 115 kV line	1325	2017	Bulk system	Not started	Yes	In Appendix F	13

EXPLANATORY NOTES:
Priorities 1 to 4 were based on actual and expected 248 filing dates

- The East Avenue Loop project was filed first
- The Southern Loop project was filed second. Deficiencies that are affected by the Southern Loop project were given the same priority level.
- The St Johnsbury priority level depends on the Burke Mountain proposed expansion plan
- It is expected that the Middlebury project will be filed next. It will also address the New Haven deficiency, which was given the same priority level as Middlebury.

Other priority levels were assigned based on the status of studies, the load level where the deficiency is identified, and the amount of load that may be affected.

- The Saint Albans area study is about to start. Projects that affect the Saint Albans area were given the same priority level.
- The Rutland area study is expected to start in the third quarter of 2008.
- The Hartford deficiency was given the next priority level due to the load level at which the deficiency occurs.

The transmission projects were prioritized based on the load level at which they occur, and whether there are operational actions that can remove the concerns.
The PV20 concern, although it emerges at the 1100 MW load level, can be re-evaluated at the same time as the other transmission concerns.
It is expected that the solution to the other transmission deficiencies will likely be a common one.
These transmission concerns are far enough in the future, that it makes sense to re-evaluate them to account for a new load forecast to be completed in Q2 2008, and projected generation additions.
For the Coolidge 345/115 kV transformer, the Southern loop project includes a Coolidge station upgrade that makes provisions for the 2nd transformer to be installed at a later date.

TIMING OF PROJECT STEPS FOR ALL IDENTIFIED RELIABILITY DEFICIENCIES

		CALENDAR QUARTERS																					
		2008			2009				2010				2011				2012				2013			
	Completed	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Priority 1: Southern Loop	T, N, SCI																							
Priority 2: Waterfront Phase 1	T, N, SCI																							
Priority 2: Waterfront Phase 2	T, N	SCI																						
Priority 2: Waterfront Phase 3																	T		N	SCI				
Priority 2: DI Phase 1	T, N, SCI																							
Priority 2: DI Phase 2	T, N	SCI																						
Priority 2: DI Phase 3																	T		N	SCI				
Priority 3: St. Johnsbury	T		N	S	CI																			
Priority 4: New Haven/Middlebury	T, N, SCI																							
Priority 5: St. Albans/E Fairfax/Georgia				T	N	SCI																		
Priority 6: N Rutland/Cold River						T				N		SCI												
Priority 7: W Rutland/Blissville	TBD																							
Priority 8: Hartford	TBD																							
Priority 9: PV20	TBD																							
Priority 10: Ascutney	TBD																							
Priority 11: Coolidge	TBD																							
Priority 12: Barre/Berlin	TBD																							
Priority 13: New Haven/Williston	TBD																							
Priority 14: Williston/Tafts Corners	N/A																							

Note: No analysis will be performed for Priority 14. See text.

Key:

T = Transmission analysis
N = Non-transmission alternative analysis
S = Solution selection
C = Cost allocation
I = Implementation strategy
TBD = To Be Determined based on 2009 Long-Range Transmission Plan
N/A = Not applicable

KEY TO ACRONYMS

ASC:	Area-Specific Collaborative
CPG:	Certificate of Public Good
CVPS:	Central Vermont Public Service
GMP:	Green Mountain Power,
kV:	kilovolt
LRTP:	Long-Range Transmission Plan
MOU:	Memorandum of Understanding
NTA:	Non-Transmission Alternative
PSB:	Public Service Board
VELCO:	Vermont Electric Power Company
VSPC:	Vermont System Planning Committee