

Operating Committee MINUTES
February 15, 2018, 11 a.m. – 3:00 p.m.
GMP Montpelier, VT

PARTICIPATING MEMBERS

Mike Burke (Green Mountain Power), Ken Couture (Green Mountain Power), Frank Etori (VELCO), David Kresock (Stowe Electric Department), Craig Myotte (VT Public Power Supply Authority/Morrisville Water and Light Department), Jason Pew (VELCO), Bill Powell (Washington Electric Cooperative), Chris Root (VELCO), Ken Tripp (Vermont Electric Cooperative).

Next Meeting
March 15, 2018
11 a.m. – 3 p.m.
GMP, Montpelier

1-866-720-4556
Code: 6027065

OTHER PARTICIPANTS

Tim Follensbee (VELCO), Jim Madej (Vermont Energy Investment Corporation), Colin Owyang (VELCO), Mark Sciarrotta (VELCO), Jay Shafer (Lyndon State College/Northview Weather), David Siuta (Northview Weather), Kris Smith (VEC), and Ron Welch (VELCO).

OPENING REMARKS

Mr. Root called the meeting to order at 11:01 a.m., verified a quorum, and reviewed the agenda, which includes two items with guests that will be present for only their respective topics: Dr. Shafer and his work with outage prediction (Northview Weather) and Mr. Madej of VEIC who will discuss his new role as CEO and his goals for the company.

SAFETY TOPIC

Mr. Smith discussed a recent issue he discovered when changing out a light fixture. When he removed the CFL that was installed in the fixture he discovered that the base of the bulb was brown and had melted to the fixture itself. This fixture and bulb were installed prior to his ownership. He investigated further and the bulb, a Commercial Electric brand CFL, had been recalled several years ago before he owned the home. He encouraged people to investigate bulbs in their own homes and check for similar deficiencies or recalls.

OUTAGE PREDICTION UPDATE

Mr. Root introduced Dr. Shafer of Lyndon State College and Northview Weather.

Dr. Shafer thanked the group for the opportunity to discuss his new company and the work they have been doing to support an outage prediction model. Mr. Shafer introduced Mr. Siuta, also of Northview Weather, to assist with the presentation.

Dr. Shafer highlighted some of the salient points of the outage prediction model:

- Calculates over 100 B calculations/day
- Has operated with 100% reliability since its development
- Includes a probabilistic prediction of ice thickness and wet snow hazards
- Operates in a cloud environment
- Their research indicates web bulb temperature is the best indicator of wet snow/icing

- Uses 66 different weather forecasts; makes a resilient ensemble
- Probabilistic prediction's advantages
 - More resilient to prediction challenges near freezing temperatures
 - Increased event detection
 - Recognition of certain scenarios are recognized sooner
 - More objective and efficient with pre-storm decision making

A comparison to the accuracy of the National Weather Service forecasts indicated that forecasts for day 1-2 and day 2-3 is approximately 15% more accurate at predicting icing/wet snow.

Mr. Root asked how the comparison is to actual is done. Dr. Shafer reported 30-50 observed measurements used in point verification for three of the storms since December.

Dr. Shafer and Mr. Siuta provided an online demonstration of the prediction model. It included current near-future results for five different time horizons, and selectable weather options. Views included a geographic state-wide heat map, specific VT Distribution Utilities (VDU) view, and tabular data. When viewing possible icing events line miles with potential exposure is provided.

In addition to the wet snow/icing, the program can provide a wind risk hazard assessment that uses the VELCO WRF model results. This assessment includes a visual representation of the forecast prediction using a "wind rose" or tabular data and line miles of potential exposure up to three days in advance.

Mr. Burke inquired about convection wind, caused by thunderstorms. Dr. Shafer reported that all available data from the VELCO WRF would be viewable.

Dr. Shafer further discussed future improvements that included:

- Continued improvements to snow and ice loading
- Multi-variable effects such as wind combined with snow/ice load
- Development of a wind outage model
- Development of a probabilistic mesoscale modeling system
- Exploration of predicting effects of ice/snow on renewable forecasting

Dr. Shafer reported that he was looking for support in running the system operationally.

Mr. Root asked what support looked like. Dr. Shafer reported providing software as a service, licensed access as a service, and/or the potential for each DU to have access online with specific views or products as agreed upon.

Mr. Tripp inquired about where the DUs might end up if Northview was to be sold. Dr. Shafer indicated that he doesn't see that happening and if it did, he would honor existing agreements.

Mr. Burke reported that GMP is hosting a North Atlantic Mutual Assistance Group (NAMAG) conference in April of this year and might have an opportunity for Dr. Shafer to present his product. He further reported that GMP is interested in supporting the further development and operationalization of the product but they are currently looking to reduce rates, finding ways to fund any agreement would be challenging.

Mr. Owyang reported that he would be willing to engage each interested DU or their legal departments and brainstorm ways to make a successful partnership while reducing any risk exposure as discussed by Mr. Tripp.

Mr. Tripp reported that he would like to get involved and is willing to explore options.

Mr. Root responded that investigating a potential partnership seems unanimous and that he will brainstorm some options as well.

MINUTES APPROVAL

Mr. Pew presented the meeting minutes from January 18, 2018.

Mr. Root discussed the inclusion of solar installation location within the minutes, specifically with regard VT transmission Interfaces. The group discussed and decided to remove the solar capacity within and external to VT transmission interfaces.

Mr. Tripp moved for approval with the noted amendment to the solar installation locations, Mr. Myotte seconded, and the minutes were approved as edited.

SWITCHING INCIDENT AT NEWPORT SUB

Mr. Welch, VELCO's Manager of Control Center Operations, presented a Root Cause Analysis report that was performed in response to a recent switching error. The error occurred between two Control Centers and resulted in reclosing being defeated (preventing the reclosing of breaker following a fault) on an incorrect line.

Three-part communication was used by both Control Centers, however, due to the similar nomenclature of the station device names, the adjacent line's reclosing was defeated leaving the field personnel exposed to potential hazard following an initiating event such as unintended line contact.

The Control Centers both took an active role in the analysis, which was led by VELCO. The analysis determined several causes and mitigating processes to reduce the chances of a similar event in the future. These items included:

- Original date of the work was postponed, which resulted in the corresponding outage application being removed from the VELCO System Operators outage application notebook. Had this been available, it would have indicated the correct devices to manipulate.
 - A VELCO Operating Instruction will be developed to capture the desired handling of outage applications.
 - VELCO System Operators will review completed, scheduled, and any unanticipated next-day work with each VDU Control Center nightly
- Active listening was not used and thus the miscommunication of device was not recognized upon read-back by the issuer.
 - Adding a requirement for a pre-job discussion to switchman training to review job scope and verify correct actions are being requested and executed
 - Reviewing three-part communication with a focus on active listening during the

current Joint Operator training between VELCO and VDU System Operators

- The VELCO and VDU SCADA displays did not use the same nomenclature.
 - Update displays to use ensure common line identifiers are used

Mr. Welch offered to present the findings of the analysis to any of the VDU System Operators if requested.

Mr. Couture will investigate using a WebEx to review the analysis with the GMP System Operators and will follow-up with Mr. Welch directly.

VT AGENCY NATURAL RESOURCES (ANR) UPDATE

Mr. Follensbee, VELCO's Environmental Manager, presented an update on VELCO's ongoing Structure Condition Improvement (SCI) project that included:

- The need for the project due to results from 2010-2011 study where a significant number of structures on the VELCO system were aging and in need of replacement
- Currently averaging approximately 300 structure replacements per year
- Insect damage has been uncovered on cross arms and poles; photos of actual replaced structures were viewed that illustrated the significance of the damage
- Throughout the process, local-level personnel of VT ANR and the Army Corps of Engineers were engaged as appropriate
- VELCO began planning for work within a VT State Park
 - The scope of work included:
 - Replacement of structures
 - Improving an existing access route
 - Work was being coordinated with local State Park personnel
 - State-level park personnel were informed of the work and requested further information and included the ANR in subsequent discussions
 - ANR agreed that the structure work within the existing VELCO ROW was not of concern as it was considered maintenance
 - ANR did have further questions regarding the access corridor improvements, which required some tree clearing and other reinforcement work for it to support heavy equipment
 - These inquiries led to discussions as to whether or not a Certificate of Public Good (CPG) was necessary for SCI project work
 - In November of 2017 VELCO met with ANR to discuss their requests for additional information
 - ANR appeared satisfied with the responses and requested a follow-up discussion that has yet to be scheduled

K42 UPDATE

Mr. Root reported on work to improve the K42 line with regards the Sheffield Highgate Export Interface (SHEI). This line was noted to have the most losses in VT as it operates at near capacity the majority of the time, which, in part, leads to the SHEI area constraints. The K42 line's thermal limit will become the limiting element following the anticipated area improvements to mitigate potential low voltage issues, the current limiting condition.

One mitigating option is to implement dynamic thermal ratings, which would account for actual temperature and wind data and would likely increase the ratings during the shoulder seasons. An example of summer ratings being calculated at 100° F when actual temperatures are anticipated well below was cited. The use of dynamic ratings would involve purchasing special equipment and other costly logistics that are still being investigated. After discussion with ISO-NE, a consensus that would allow the use of temporary temperature sensitive ratings, a no-cost option, would be used to provide immediate relief if necessary.

A second mitigating option to construct a new line in the existing ROW was outlined. Approximately 50% of the structures on the K42 line require replacement as part of the current SCI project and the remaining would need replacement likely within the next 5 years. Cost of upgrading the line may be reduced if NE funding for the structure replacement project was used to supplement the total construction cost. Additionally, the current SHEI interface would be unaffected during construction and would, at its conclusion, result in added SHEI export capability.

VERMONT ENERGY INVESTMENT CORPORATION (VEIC)

Mr. Root introduced Jim Madej, the recently appointed CEO of the Vermont Energy Investment Corporation, who requested time to discuss VEIC's future and roles within the state.

Mr. Madej provided a brief background of this employment history, which included time working with Mr. Root and Mr. Owyang at National Grid. He discussed VEIC and the relationship with Efficiency Vermont (EVT). EVT is one of several companies operated by VEIC. VEIC has approximately 300 employees throughout VT, Ohio, and Washington DC; of those, EVT employs approximately 100 in VT.

He acknowledged that VEIC's work impacts the VDUs, not always in a positive manner. He reported that one of his goals is to target efficiency initiatives in partnership with the VDUs and ensure that everyone is working together. As he described it, he wants the next step to be a "partnering model."

Mr. Ettori asked what the need is that his company is trying to solve. Mr. Madej reported that he felt a first step would be to reduce the cost of electricity in the state as he believes VT rates are high. Additionally, focusing efficiency work in areas that are experiencing overloads or needing infrastructure upgrades, rather than any smearing solutions across the state would benefit everyone.

Mr. Root inquired how VEIC/EVT could assist with implementing the next generation of demand management as the VDUs are investigating those technologies. Mr. Madej reported that the resources within the VEIC/EVT are available and willing to assist with any project if requested to do so.

Mr. Madej thanked the group for their time and added that if anyone had a specific problem, let him know and he will work to find a common solution.

VERMONT WEATHER ANALYTIC CENTER (VWAC) AND UTOPIUS INSIGHTS (UI) UPDATE

Mr. Owyang provided a high level review of the recent sale of Utopus Insights (UI) to Vestas. A discussion followed on the specifics of transaction and how it impacts VELCO and VDUs.

Mr. Etori presented the current status of the VWAC initiative including:

- The previous Joint Development Agreement
- The current software license agreement
- The 2017 VWAC role in VELCO's Key Performance Indicators (KPIs)

Mr. Smith inquired as to the status of the bi-weekly weather model meetings. They have not been taking place and requested an update on several of the open items that had been previously detailed during those meetings. Mr. Root reported that a previously scheduled meeting with UI is taking place in March to discuss similar topics and will include this item.

ISO-NE WEBSITE

Mr. Etori provided an online demonstration of the ISO-NE public site that includes a posting of Long- and Short-Term outages scheduled throughout New England. He displayed the ability to sort the Excel file by VELCO assets which makes it more useful for the VDUs to know what facility outages are scheduled. This knowledge can be used to assist with their prioritization and scheduling of their own maintenance.

VELCO BOARD OF DIRECTORS (BOD) UPDATE

Mr. Root provided a review of the VELCO January Board of Director's meeting. Highlights included:

- An announcement from Christine Hallquist that she will be running for Governor and that will likely require a leave of absence from VEC.
- A review of the UI sale to Vestas, at the time was still under development. During the meeting, Mr. Dunn was instrumental in negotiating some specific details of the sale that could have prevented its execution had it not been addressed.
- In April the entire Board is up for re-election
- A review of the work being completed to support SHEI mitigation was discussed

OTHER BUSINESS

Open Discussion

Mr. Root discussed the recent Massachusetts renewable RFP. The Northern Pass project was accepted by Massachusetts, however shortly after; the New Hampshire Site Evaluation Committee rejected the project unanimously. The likely result of the rejection by NH will be a reevaluation of the proposals to choose a new project to continue attempting to negotiate a contract. Also noted were two similar RFPs anticipated from Connecticut and Rhode Island, each approximately 400MW. Details of these two new RFPs have yet to be released.

Mr. Pew reported a meeting of the IEEE Green Mountain Chapter is being scheduled for either April 6 or April 13 at Dynapower in South Burlington to discuss the new IEEE 1457 National Standard for Interconnecting Distributed Generation. Mr. Root reported that all VT protection system engineers should attend as it will provide valuable information

for the implementation of the new standard. More information will be provided as the details are finalized.

Next Meeting Items

- Possible items for consideration
 - A discussion on VT interconnection process coordination between VELCO and the VDUs
 - A revisit of the solar installations reported from January and the desire to maintain the list as accurately as possible
 - Follow-up on the Dr. Shafer/Northview Weather presentation
 - Stowe—Morrisville sub-transmission line protection options

MOTION TO ADJOURN

Mr. Couture moved to adjourn, Mr. Myotte seconded, and the meeting was adjourned at 2:53pm.

Respectfully submitted,

Jason Pew
VELCO OC Secretary