Vermont Weather Analytics Center

vermont electric power company

VELCO

Vermont System Planning Committee

April 25, 2018

2018 JDA & commercial product delivery

March 8 VELCO/UI Meeting

- Meeting focused on meeting JDA and commercial deliverables
- UI committed to successful execution of the JDA as well as the commercial offerings
- VELCO/UI relationship and success execution is UI priority
- Action plan
  - Deliver JDA and commercial offerings
  - New personnel assigned
  - Better communications, coordination and project management

JDA Work

- Residual Demand Forecasting improvements
- PLM improvements

Commercial Product Delivery

- Access control to data for Vermont distribution utilities in HyperCast
- Extend weather forecast from 3 days to 10 days
- Product support 24x7

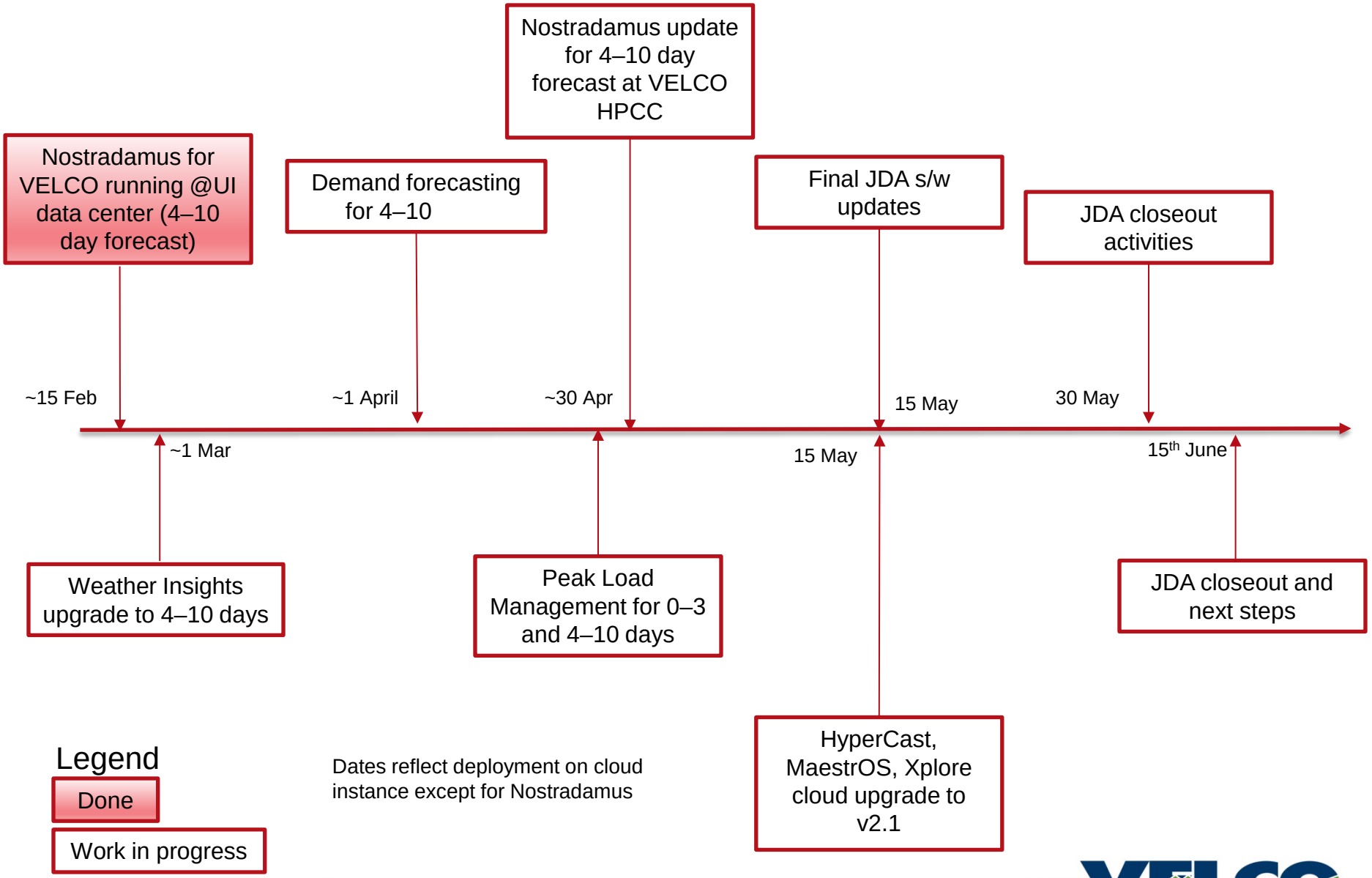
Work plan developed with UI based upon meeting commitments

JDA tasks and planned deliverables

JDA Project	Task/Issue/Requirement/Bug	Pilot Deployment	Cloud Deployment	Impact
Peak Load Management	Non-peak day probability forecast	20 Feb	26 Feb	Fixes probability assignment for non–peak hours; filter less aggressively
Peak Load Management	First day of month forecasting (fence post problem)	20 Feb	26 Feb	Initializes P(before) for previous calendar month
Peak Load Management	Last day of month forecasting (fence post problem)	26 Feb	2 March	Initializes P(after) for next calendar month
Peak Load Management	Improve notification using upper bound forecast	1 April	15 April	Notifications will align with monthly peak
Peak Load Management	Improve notification threshold value for flat probability values	15 May	1 June	Adaptive approach to notification once “similar” peak values repeat more than 5 times
Demand Forecasting	Develop new PV model	15 April	15 May	Improve accuracy of day-time demand forecast

P=Peak load

2018 JDA and Commercial Product Delivery



VWAC Phase II—weather status

Developments

Forecasting and visualization improvements

- Nowcast weather forecasts successfully run on VELCO HPCC March 12
- Testing underway for incorporating Weather Insights into mobile applications for field personnel
- First version of utility outage forecasts for wet snow and ice events developed and delivered by Lyndon State College
- VELCO Mineweather (MacroSoft weather and energy forecasting verification platform) completed; demonstration of weather verification platform provided to VELCO on March 23

Instrumentation

- Seven new weather stations to be installed at VELCO substations in Q2-3 2018

Next steps

- Deploy improvements to Weather Insights visualization to include utility infrastructure data, observations, alerting, and additional weather variables, and increase forecast length to 10 days
- Address Weather Insights' large bandwidth consumption
- Continue to deliver Lyndon State College utility outage forecasts and seek distribution utility feedback
- Begin user acceptance testing of VELCO Mineweather (MacroSoft verification platform)
- Incorporate Nostradamus in phase 2 of verification platform including energy forecasts (state demand, state PV, wind, and solar); finalize web portal design
- Evaluate ensemble forecasting using Nostradamus, VELCO WRF and Deep Thunder

VWAC Phase II—peak load management (PLM)

Developments

- PLM application cloud instance made available to DUs February 26
  - All applications accessible through Utopus Insights' (UI) landing page
- Improved email alert Vermont monthly peak probability notifications
- Deployed improvements addressing beginning and end of month peak probability
- High-level meeting held with UI senior leadership to set performance and schedule targets for DU forecasting and monthly PLM

Next steps

- Distributed energy resources (DER) are assumed to be dispatched according to plan, and utilize constraints identified with each resource—as feedback reporting on actual DER is developed, system will record actual DER deployment for analysis
- Incorporate longer range weather forecasting capability
- Upgrade portal graphics to show more VT-specific detail and use GIS derived data

VWAC Phase II—platform development

Developments

- Nostradamus v2 installed on VELCO HPCC
- Performed testing to determine need for additional dedicated nodes to support 10-day weather forecasts
- Installed additional head node and twelve computational nodes on ~~the~~ HPCC, completing VELCO HPCC build-out

Next steps

- Deploy Nostradamus v3 Q2 2018 on VELCO HPCC
- Investigate using Torque Scheduler to optimize use of VELCO HPCC
- Install Grid Xplore on VELCO cloud version of MaestrOS Q2 2018
- Evaluate hardware configuration for hosting current cloud-based models

Collaborative work summary

- Northview Weather LLC provided utility outage forecasts; thus far DU feedback has been positive
- Nowcasts provided in support of recent weather event forecasts
- Met with UVM March 2 to discuss development of real-time operations and planning tools to visualize reliability issues given wind/solar/load uncertainty
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- Update provided to Operating Committee March 15
- Begin implementation plan roll out within VELCO and DUs