Recent Weather Event Analysis

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Verification – 5/5 High Wind Event

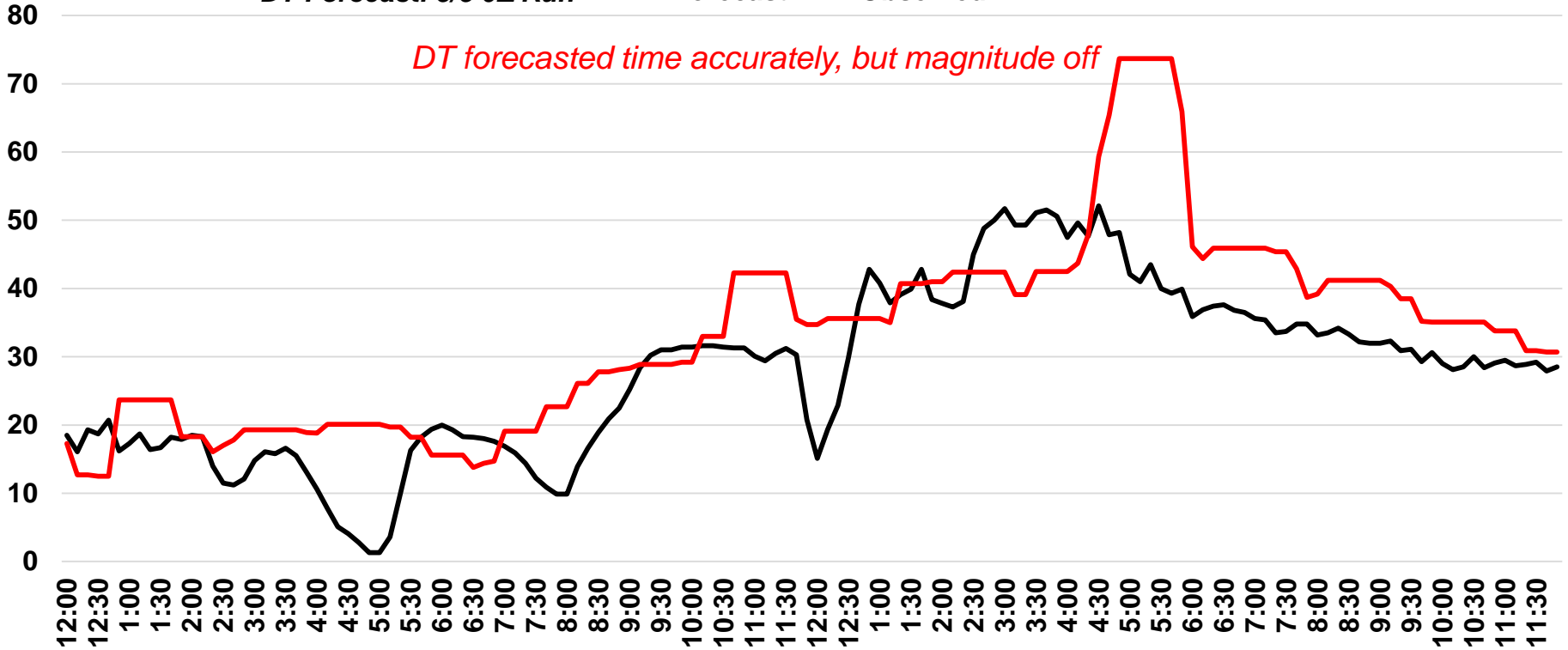## Event Summary
Outages: ~30,000 GMP outages (~600 jobs)
Storm Reports: 11 High Wind Reports (via NWS)
Mutual aid called in from ME, MA, and Canada

Verification
Magnitude: ✗ (Under Forecasted)

Timing: ✓ (+/- 1-hour)
Error (All VT): 5.1 mph (Day 1), 6.7 mph (Day 2), Day 3 N/A

Wells (VTW09) – DT Forecast vs. Observed Time Series

DT Forecast: 5/5 0Z Run —— **Forecast** —— **Observed**

DT forecasted time accurately, but magnitude off

Verification – 5/25 High Wind Event
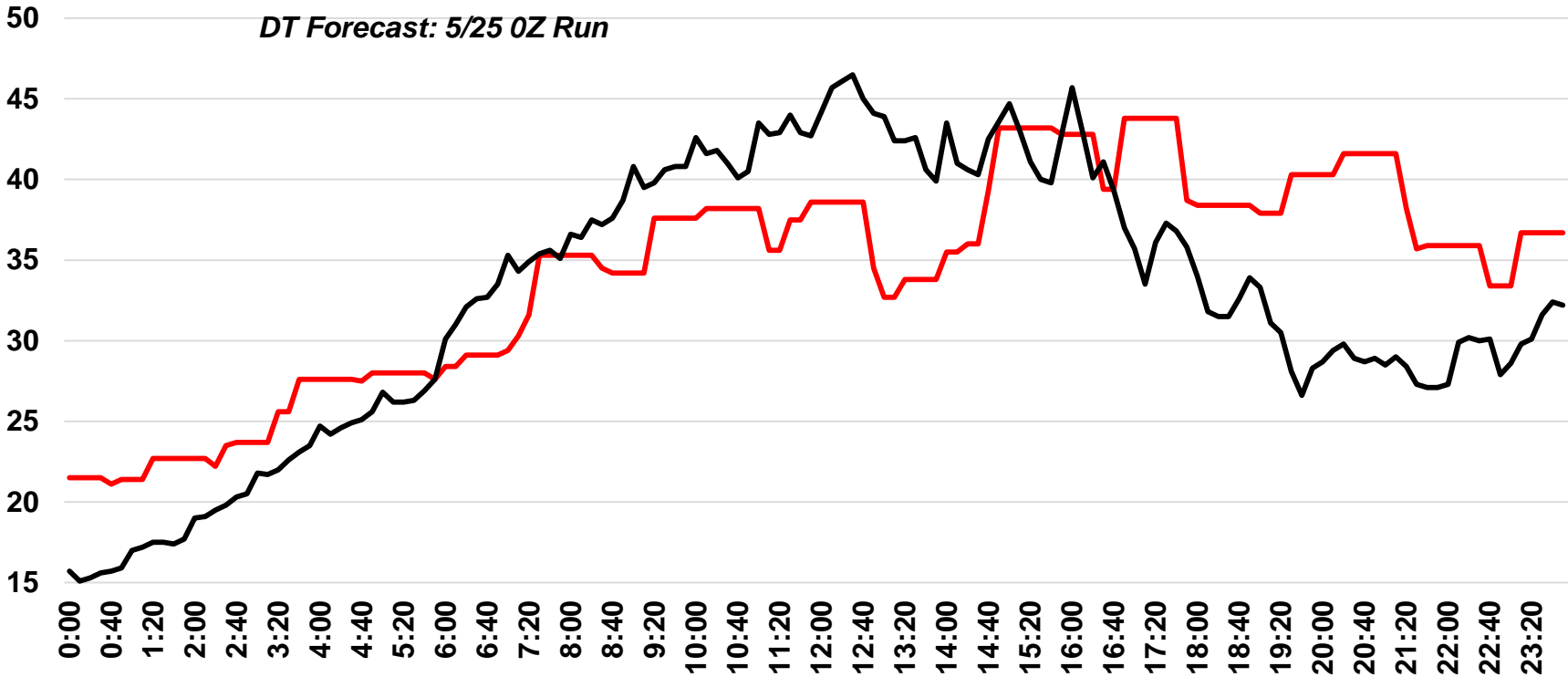
Event Summary
Outages: ~3,699 GMP outages (~90 jobs)
Storm Reports: 0 High Wind Reports (via NWS)

Verification
Magnitude: ✓ (+/- 5 mph at observed peak gust)

Timing: ✓ (+/- 1-hour)

Ludlow/Okemo (VTW13) – DT Forecast vs. Observed Time Series

— Observed — DT

DT Forecast: 5/25 0Z Run

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Verification – 5/31 High Wind & Hail Event

Event Summary
Outages: ~2,789 GMP outages (~64 jobs)
Storm Reports: 10 High Wind Reports,
15 Hail Reports (via NWS)

Verification
Magnitude: ✓ (+/- 5-10 mph at observed peak gust)

Timing: ✓ (+/- 1-hour)
Error (All VT): N/A

NWS-Burlington Forecast   ✓   ✗
-Whole region capable of experiencing 1" diameter hail and gusts up to 60 mph

Deep Thunder Forecast
-Forecasted maximum gusts around 40 mph and only at mountain summits

Observed
-Maximum gust was 35 mph at Mt. Mansfield
-Isolated tree damage but primarily a hail event

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Lessons Learned

- **Weather Forecast**
  - Deep Thunder continues to show improvement in the wind gust forecasts but requires additional verification and tuning to support continuous improvements
  - Action:
    1. Install additional weather stations (7 new installations by Q32017) to improve model verification (includes implementation of VELCO verification platform) and implement new gust algorithms to VELCO WRF model
    2. Develop additional forecasting techniques such as probabalistic and ensemble forecasts to enhance predictability (this work to start following DT installation on VELCO HPCC)

- **Impact/Outage Forecast**
  - Deep Thunder forecast information needs to be coupled to an impact/outage model in order to achieve optimal decision support for storm response
  - Action:
    1. Develop outage prediction model that can correlate moisture, foliage, asset health, etc. values to historical outage data and output outage estimates (also for wet snow/ice events; scope in progress via phase 2 of LSC/VLITE research grant)

- **Communication**
  - Deep Thunder performed well during most of these events and provided sufficient lead time, but the forecast information was not shared effectively to VT stakeholders
  - Actions:
    1. Ensure all VT stakeholders are subscribed to the Deep Thunder email alerts; provide additional training if needed
    2. Enhance and fine-tune email alerts (implement more customization around alert thresholds and weather categories)