Cold Snaps and Pipeline Disruptions – Historical Data

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• At the May FSSTF, PJM presented the Risk Assessment Approach which included:
  – Identifying the Relevant Risks (this was covered at the June FSSTF meeting)
  – Identifying the potential realizations of each Relevant Risk.
    • To accomplish this, historical data on each Relevant Risk will be analyzed
• At today’s FSSTF, PJM will present historical data on two such Relevant Risks: Cold Snap and Pipeline Disruptions
• At the August FSSTF, PJM will present historical data on the remaining Relevant Risks as well as the impact of the Relevant Risks on PJM generation
# Relevant Risks Identified at June FSSTF Meeting

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Cold Snap – Definition

- A series of 5 or more contiguous days where the average RTO wind-adjusted temperature (WWP) in each of such days is less than 21.5°F
  - The RTO WWP for a given day is calculated as a load-weighted average across 30+ weather stations in the current PJM footprint, and across the 24 hour readings of each day
  - The 21.5°F threshold corresponds to an estimate of the 90th percentile value of historical daily RTO average WWP values
Cold Snap - Data

- Weather data from period DY1972 - DY2018 (47 winter periods)
- Average RTO wind-adjusted temperature (WWP) is calculated for each of the winter days
A total of 29 cold snaps in 47 winter periods are identified.

Average: 0.6 Cold Snaps per Delivery Year (Winter)
A total of 29 cold snaps in 47 winter periods are identified.

Average: 0.6 Cold Snaps per Delivery Year (Winter)
Cold Snaps – Number of Cold Snaps of Length X Days

Average Length: 7.5 days
Cold Snaps – Delivery Year vs Length of Cold Snap
Cold Snaps – Delivery Year vs Length of Cold Snap (and Min T at Peak Hours)

Min T° at Peak Hours
-10
-5
0
5
10

Peak Hours:
Hours Ending 7 and 19
Pipeline Disruptions – Definition

- Pipeline failure event impacting the onshore gas transmission system where the reported failure mode is classified as either a Rupture or a Mechanical Puncture
  - Events where the reported failure mode is classified as a Leak or Other are not included as Pipeline Disruptions because they are deemed to be less impactful
Pipeline Disruptions – Data

- Event data collected by the Pipeline and Hazardous Material Safety Administration (PHMSA) of the United States Department of Transportation in the period 2010 – 2019 Q2
- Events with a start date in Winter time (Dec – Feb) are included
- Events reported by Pipelines or Local Distribution Companies (LDCs) to which PJM generators are connected are included
- Events that have occurred within a PJM State are included
A total of 10 disruptions in 9 winter periods are identified.

Average: 1.1 Pipeline Disruptions per Delivery Year (Winter)
A total of 10 disruptions in 9 winter periods are identified.

Average: 1.1 Pipeline Disruptions per Delivery Year (Winter)
Duration shown for 7 events only.

Outliers and events with missing data are not shown.
State vs Number of Pipeline Disruptions

The graph shows the number of pipeline disruptions by state. For the states Illinois (IL), Kentucky (KY), North Carolina (NC), Ohio (OH), Pennsylvania (PA), Tennessee (TN), and West Virginia (WV), the number of disruptions varies. Illinois and North Carolina have the highest number of disruptions, while Pennsylvania, Tennessee, and West Virginia have the lowest number of disruptions.