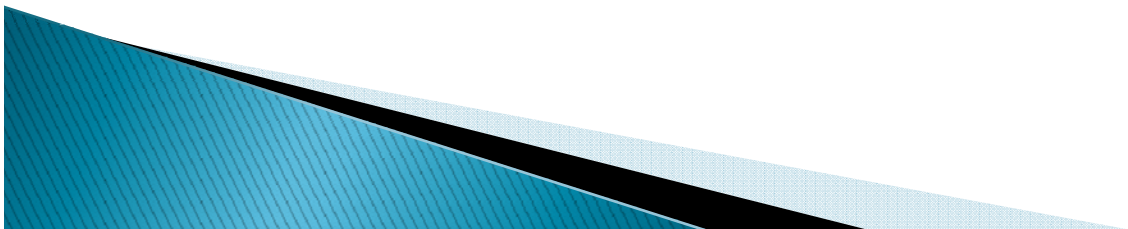


**DVP Alternatives
for Consideration
to Resolve 2015 RTEP Issues
Presented at June 9, 2010
TEAC**

PJM 2015 RTEP Results

- ▶ **Based on PJM's latest analysis presented at the June 9, 2010 TEAC**
 - THERMAL Deficiencies begin to occur in 2017
 - Earliest Dominion line to overload is Mt Storm – Doubs 551 line in 2017
 - PJM sensitivity analysis advanced overload to 2016 when considering RPS
 - REACTIVE Deficiencies occur in 2015
 - Multiple contingencies will not solve
 - Results in significant impact to Dominion system

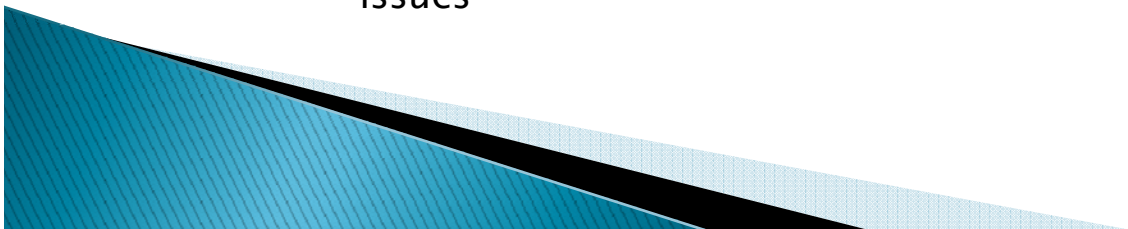


PJM 2015 RTEP Results cont.

- ▶ All 2015 reactive deficiencies can be resolved with reactive reinforcements
 - See PJM Alternatives 5 and 6 from June 09, 2010 TEAC presentation
 - Realize this is short term fix with additional transmission infrastructure needed
 - 2010 RPM Auction results likely to reduce amount of reactive reinforcements required.
 - 9282 MW of demand response cleared 2010 RPM (32% increase over 2009 RPM)
 - The impact of the additional demand response has not been evaluated

DVP Recommended alternatives to consider

- ▶ Based on latest PJM analysis DVP has 4 alternatives to consider
 - DVP has done a high level analysis which shows alternatives provide benefits to resolving PJM identified deficiencies
 - Alternatives provide flexibility in allowing for staged construction over multi-year timeframe
 - Elements of proposals include the following
 - By 2015
 - Reactive reinforcements to resolve 2015 reactive deficiencies.
 - Rebuild Mt Storm – Doubs 500 kV Line (65% increase in lines current thermal capability)
 - Beyond 2015
 - Additional transmission infrastructure beyond 2015 to resolve longer term EHV issues



DVP Alternative Number 1

▶ By 2015

- Install reactive reinforcements to resolve 2015 reactive deficiencies. (\$110 M)
 - 900 MVAR SVC at Loudoun 230 kV
 - 900 MVAR SVC at T157 Tap 500 kV
 - 300 MVAR static caps @ Meadow Brook 500 kV
 - 300 MVAR static caps @ Loudoun 500 kV
 - 300 MVAR static caps @ Doubs 500 kV
- Rebuild Mt Storm – Doubs 500 kV Line to 4330 MVA (65% increase in lines current thermal capability) (\$300 M)
 - Can be completed by 2015
 - Can be built for DC compatibility with little additional expense
 - Limited CPCN requirement
 - With Trail in service, longer outage windows available to minimize construction period
- Install 50% series compensation at Meadow Brook end of Trail (\$10 M)
 - Flexible option with short lead time for construction or can be deferred based on final assessment

▶ By 2017

- Rebuild Mt Storm – Pruntytown line (\$200 M) cost only for Pruntytown line
 - Double circuit line may be required
 - Extend rebuild back to Harrison

▶ Estimated Cost – \$ 620 M

DVP Alternative Number 2

▶ By 2015

- Install reactive reinforcements to resolve 2015 reactive deficiencies. (\$110 M)
 - 900 MVAR SVC at Loudoun 230 kV
 - 900 MVAR SVC at T157 Tap 500 kV
 - 300 MVAR static caps @ Meadow Brook 500 kV
 - 300 MVAR static caps @ Loudoun 500 kV
 - 300 MVAR static caps @ Doubs 500 kV
- Rebuild Mt Storm – Doubs 500 kV Line to 4330 MVA (65% increase in lines current thermal capability) (\$300 M)
 - Can be completed by 2015
 - Can be built for DC compatibility with little additional expense
 - Limited CPCN requirement
 - With Trail in service, longer outage windows available to minimize construction period
- Install 50% series compensation at Meadow Brook end of Trail (\$10 M)
 - Flexible option with short lead time for construction or can be deferred based on final assessment

▶ By 2017

- Build a portion of PATH stopping at Mt Storm (\$900 M)
 - Requires installation of 765 – 500 kV auto
 - Install 900 MVAR SVC on 500 kV at Mt Storm

▶ Estimated Cost – \$1.32 B

DVP Alternative Number 3

▶ By 2015

- Install reactive reinforcements to resolve 2015 reactive deficiencies. (\$110 M)
 - 900 MVAR SVC at Loudoun 230 kV
 - 900 MVAR SVC at T157 Tap 500 kV
 - 300 MVAR static caps @ Meadow Brook 500 kV
 - 300 MVAR static caps @ Loudoun 500 kV
 - 300 MVAR static caps @ Doubs 500 kV
- Rebuild Mt Storm – Doubs 500 kV Line to 4330 MVA (65% increase in its thermal capability) (\$300 M)
 - Can be completed by 2015
 - Can be built for DC compatibility with little additional expense
 - Limited CPCN requirement
 - With Trail in service, longer outage windows available to minimize construction period
- Install 50% series compensation at Meadow Brook end of Trail (\$10 M)
 - Flexible option with short lead time for construction or can be deferred based on final assessment

▶ By 2017

- Build a portion of PATH stopping at Welton Spring (\$900 M)
 - Requires installation of 765 – 500 kV auto
 - Install 900 MVAR SVC on 500 kV

▶ Estimated Cost – \$1.32 B

DVP Alternative Number 4

▶ By 2015

- Install reactive reinforcements to resolve 2015 reactive deficiencies. (\$110 M)
 - 900 MVAR SVC at Loudoun 230 kV
 - 900 MVAR SVC at T157 Tap 500 kV
 - 300 MVAR static caps @ Meadow Brook 500 kV
 - 300 MVAR static caps @ Loudoun 500 kV
 - 300 MVAR static caps @ Doubs 500 kV
- Rebuild Mt Storm – Doubs 500 kV Line to 4330 MVA (65% increase in its thermal capability) (\$300 M)
- Can be completed by 2015
- Can be built for DC compatibility with little additional expense
- Limited CPCN requirement
- With Trail in service, longer outage windows available to minimize construction period

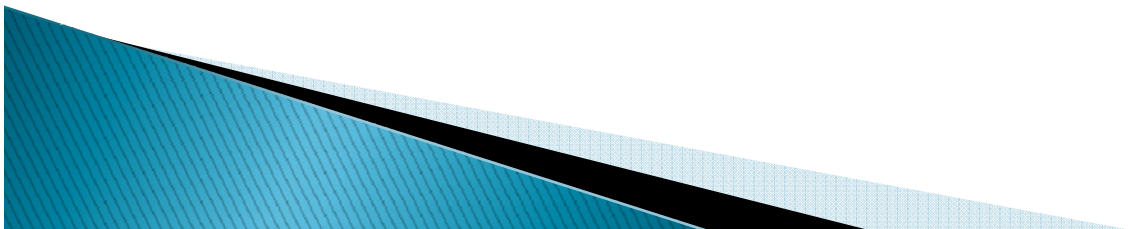
▶ By 2017

- Build PATH proposal (\$1.8 B)
 - Rebuilding of Mt Storm – Doubs and Reactive support portion of proposal by 2015 provides flexibility of extending construction period for PATH

▶ Estimated Cost – \$2.22 B

Key Facts of Mt Storm – Doubs

- ▶ 551 Line – Mt. Storm to Doubs was constructed in 1964 as part of the original 500 kV loop
- ▶ Total line length is 99.26 miles located
 - 65.7 miles in WVA (Dom Owned)
 - 30.7 miles in VA (Dom Owned)
 - 2.86 miles in MD (APS Owned)
- ▶ 150 ft ROW
- ▶ Average tower height of 102 ft



Conclusion

- ▶ DVP alternatives provide flexibility for staged multi-year construction to meet requirements of PJM RTEP 15 year Planning analysis
- ▶ Reactive reinforcements and rebuild of Mt Storm – Doubs can be implemented by 2015
 - Can be completed by 2015
 - Can be built for DC compatibility with little additional expense
 - Limited CPCN requirement
 - With Trail in service, longer outage windows available to minimize construction period
- ▶ For Alternatives 2 and 3, DVP review was limited due to our inability to emulate PJM load deliverability analysis

