



# Stability Project Beneficiaries Alternative Comparison

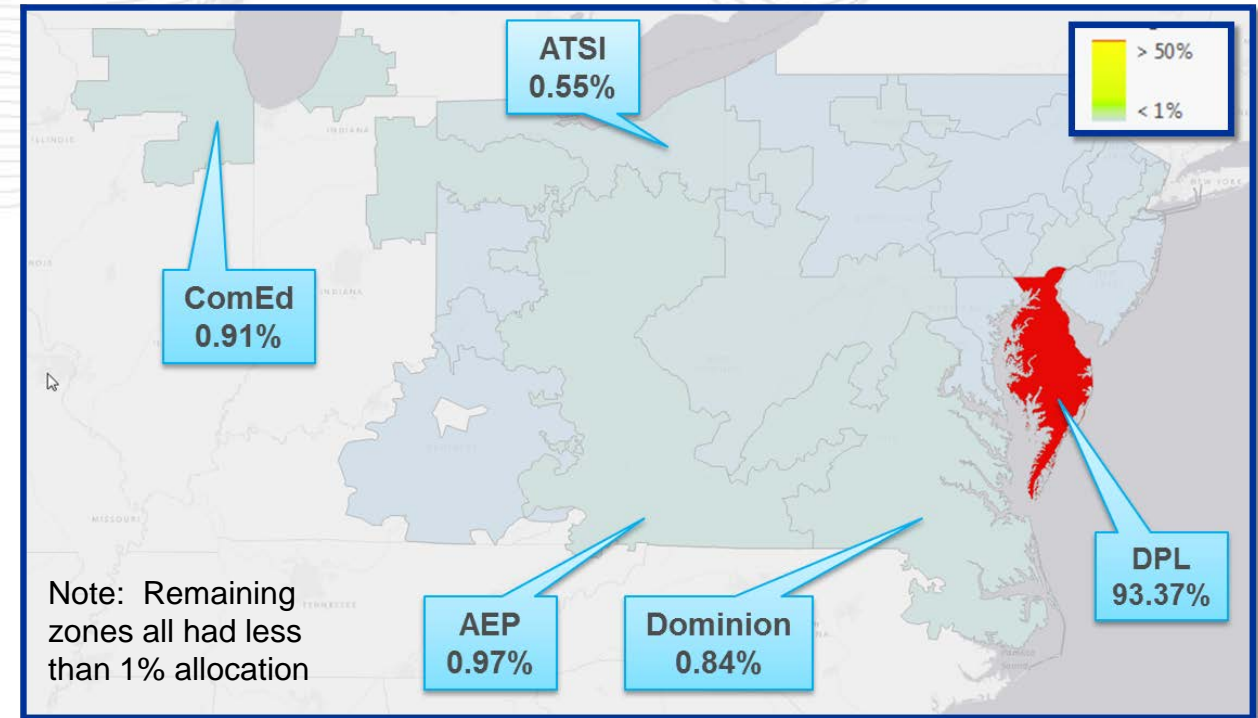


- In April of 2017 the PJM Board of Managers lifted the suspension of the Artificial Island project
- The Board also directed PJM to provide information to states and stakeholders on methods to identify beneficiaries of stability projects
- Section 205 filing rights over rates and cost allocation rest with the PJM transmission owners

- Broad range of approaches evaluated including:
  - Power system analytical approaches
  - LMP based approaches (e.g. determine load payment impact of the unstable unit(s))
  - Rule-based approaches (e.g. allocate to the zone unstable unit is located)
- Analytical approaches meriting further consideration
  - Existing solution based d-fax method
  - Stability Interface d-fax method
  - Stability Deviation method

## Description

- Determine DFAX on new upgrade from all PJM generation to each zone's load.
- Determine zonal MW impacts by multiplying DFAX by peak load for each zone.
- Weight zonal MW impacts to account for directional usage of new upgrade from production cost simulation.
- Use the directionally weighted zonal loads as the basis for allocation.



## Advantages

- Can be consistently applied for all RTEP upgrades.
- Generally provides reasonable allocations.
- Easy to implement.

## Disadvantages

- May not provide reasonable allocations for stability driven upgrades.

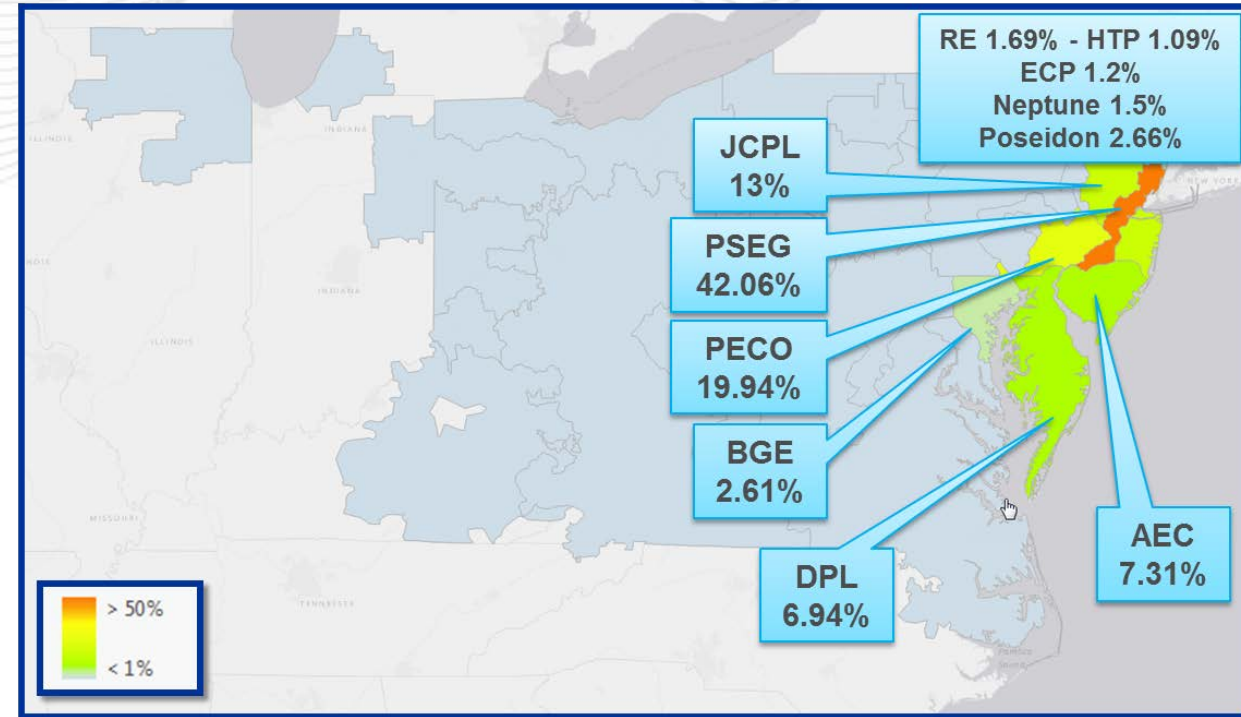
# Stability Interface DFAX Method

## Description

- Develop a closed interface that surrounds the generators with stability issues.
- Determine the DFAX for each transmission facility that comprises the interface in the same manner as the existing solution-based DFAX is calculated.
  - Ignore DFAX values that are not in the same direction as the predominate hourly usage.
- Multiply the DFAX by the load of each zone.
- For each zone sum the MW impacts for each line.
- Use the total MW impacts for each zone as the basis for the allocation.

## Advantages

- Consistent with the existing solution-based DFAX cost allocation methodology.
- Easy to implement.



## Disadvantages

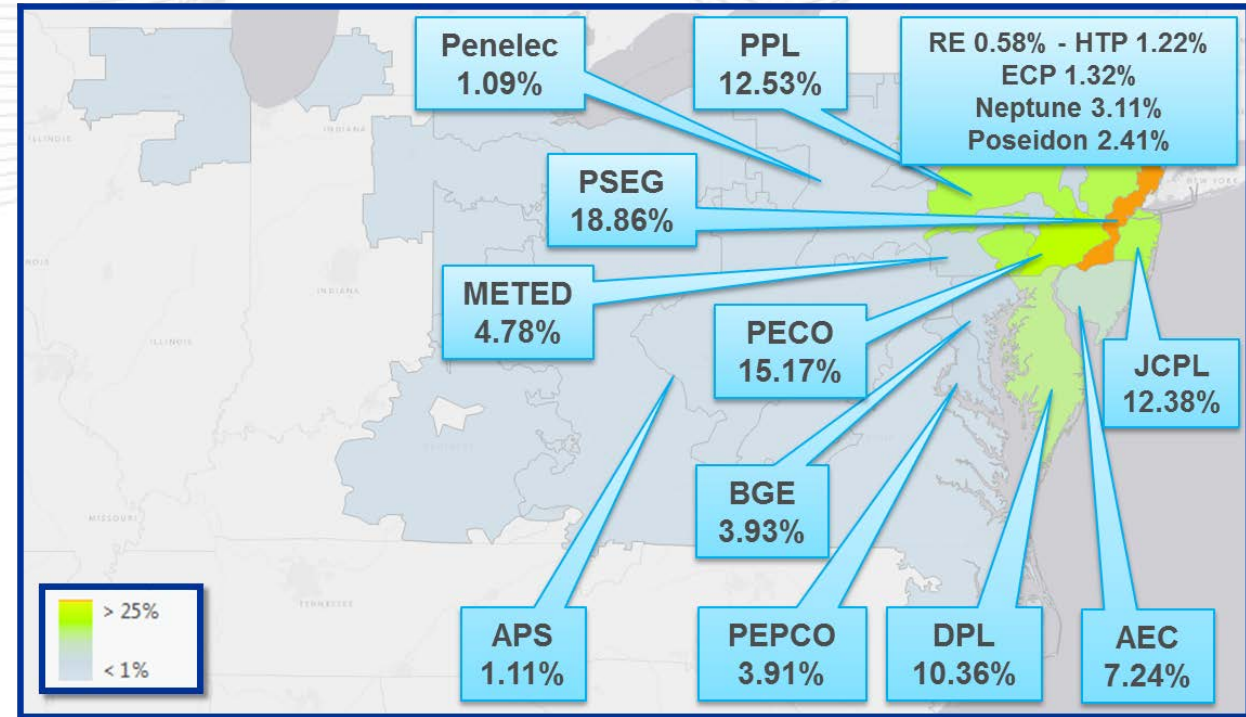
- Need to develop an interface, which could be viewed as subjective

## Description

- Perform a transient stability study for the worst fault conditions and monitor the angle deviation at each PJM load bus. Ignore load buses with angle deviations less than 25% of the load bus with the largest angle deviation.
- Multiply the angle deviation at each load bus by the MW load at the bus and sum these load-weighted angle deviations for each zone.
- Use the total load-weighted angle deviations for each zone as the basis for the cost allocation.
- For each worst fault condition, perform a separate cost allocation and take the average of the allocations.

## Advantages

- Based on stability simulations.



## Disadvantages

- Labor and time intensive.
- Cutoff based on engineering judgment; cutoff may not be appropriate for all stability issues.



# Cost Allocation Approaches

Zone	Existing Method	Stability Interface DFAX Method	Stability Deviation Method 25% Cutoff
AEC	0.12%	7.31%	7.24%
AEP	0.97%	0.00%	0.00%
APS	0.38%	0.00%	1.11%
ATSI	0.55%	0.00%	0.00%
BGE	0.28%	2.61%	3.93%
COMED	0.91%	0.00%	0.00%
DAYTON	0.14%	0.00%	0.00%
DEOK	0.23%	0.00%	0.00%
DL	0.12%	0.00%	0.00%
DPL	93.37%	6.94%	10.36%
DVP	0.84%	0.00%	0.00%
ECP	0.01%	1.20%	1.32%
EKPC	0.12%	0.00%	0.00%
HTP	0.01%	1.09%	1.22%
JCPL	0.27%	13.00%	12.38%
ME	0.13%	0.00%	4.78%
NEPTUNE	0.03%	1.50%	3.11%
PECO	0.36%	19.94%	15.17%
PENELEC	0.12%	0.00%	1.09%
PEPCO	0.28%	0.00%	3.91%
POSEIDON	0.00%	2.66%	2.41%
PPL	0.30%	0.00%	12.53%
PSEG	0.42%	42.06%	18.86%
RE	0.02%	1.69%	0.58%
<b>TOTAL</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

