Attachment VIII

Transmission Security Cost Allocation

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ESPWG

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NYISO

RMR Order

- ¶14: After considering the necessary reliability studies, NYISO must be the entity that makes the determination whether a specific generator is needed to ensure reliable transmission service and thus whether the facility is designated an RMR unit.
- ¶20: NYISO's RMR compliance filing should include tariff provisions specifying a methodology for allocating the costs of RMR agreements, as appropriate cost allocation is essential to ensuring that the rates charged are just and reasonable and not unduly discriminatory or preferential.
- ¶20: NYISO should ensure that any cost allocation regime is consistent with the Commission's cost allocation principles and precedents.

A Few Key Principles

- Primary beneficiaries shall initially be those Load Zones identified as contributing to the reliability violation.
- The cost allocation among primary beneficiaries shall be based upon their relative contribution to the need for the regulated solution.
- The ISO will examine the development of specific cost allocation rules based on the nature of the reliability violation (e.g., thermal overload, voltage, stability, resource adequacy and short circuit).
- Consideration should be given to the use of a materiality threshold for cost allocation purposes.

Current Reliability Cost Allocation Methodology

- Step 1: LCR Deficiency
  - *Determine MW deficiencies in meeting LCRs*
- Step 2: Statewide Resource Deficiency
  - *Use free flow test to determine statewide distribution of Compensatory MW necessary to meet LOLE of 0.1*
- Step 3: Constrained Interface Deficiency
  - *If NYCA is not resource limited as determined in Step 2, determine bounded regions to which cost responsibility is assigned*
- If after completion of Steps 1 through 3 there is a thermal or voltage security issue that does not cause an LOLE violation, it will be deemed a local issue and related costs will not be allocated under the NYISO tariff.

DRAFT – FOR DISCUSSION PURPOSES ONLY

Objectives

- The NYISO proposes to use its current reliability cost allocation methodology to allocate RMR or transmission related costs, with the following revisions:
- Develop a Step 4 in the reliability cost allocation methodology to allocate the costs of a reliability solution (RMR or transmission) to those load zones that contribute to a thermal overload on a Bulk Power Transmission Facility (BPTF), based on load's relative contribution.
- Develop a Step 5 in the reliability cost allocation methodology to allocate the costs of an RMR for non-BPTF reliability needs that are otherwise deemed local.

Bulk Thermal Concept

- N-1-1 analysis results in a single NYCA-wide optimized generator dispatch
- Using that generator dispatch with the most severe first and second contingencies applied to the model, determine how much each load contributes to the power flow on the overloaded element
- Calculate materiality thresholds to identify which loads have a significant contribution to the overloaded element and allocate costs to those loads

Method

1. **Apply most severe contingency pair to the model with associated optimized generator dispatch**
   - ***An element may be overloaded for various first and second contingencies.***
   - ***The modeling year and contingency pair that result in the highest loading on the element will be used for the cost allocation calculation.***
   - ***In most cases, the 10th year will be the most severe.***
   - ***For an RMR, the last year of the initial RMR term will be used.***

Leeds-PV Example

- **Apply most severe contingency pair to the model with associated optimized generator dispatch**
  - ***Highest loading on Leeds-PV occurred in summer 2024 case (2014 RNA)***
  - ***First contingency: L/O Athens-PV 345 kV***
  - ***Second contingency: L/O Marcy South – South tower (41&33)***
  - ***Use the generation dispatch that results from securing the system for this contingency pair in the summer 2024 case.***

Method (continued)

2. Calculate Nodal TDF and MW Flows

- ***For each Nodal Load, increase load by 1 MW while simultaneously increasing all supply generation by a total of 1 MW. Each supply generation unit participates relative to that unit's dispatch (i.e., the higher the dispatch, the greater that unit participates).***
- ***Monitor the change in flow on the overloaded element. This change in flow divided by the change in load (1 MW) is the Transfer Distribution Factor (TDF) for that node.***
- ***The Nodal TDF represents the percentage of the given load that contributes to the flow on the overloaded element on a per-megawatt basis. The sign (+ or -) indicates the direction of flow caused by the node.***
- ***The Nodal MW Flow represents the amount of MW flow due to the load.***
- ***Nodal MW Flow = Nodal TDF x Nodal Load***

Leeds-PV Example

- **Calculate Nodal TDF and MW Flows**
  - ***Generation-to-load transfer analysis to calculate TDFs:***
    - **a) Serve load within transmission-constrained zones (currently G thru J) by resources within those transmission-constrained zones**
    - **b) Serve load by remaining resources within the same zone**
    - **c) Serve load by remaining resources from all surplus zones if necessary**
  - ***Example – Zone J:***
    - **Zone J load+losses = 13,055 MW (73% of G-J load)**
    - **Zones G-J generation dispatch + scheduled imports = 14,252 MW**
    - **a) Serve Zone J load from Zones G-J: 73% of 14,252 = 10,456 MW from G-J**
    - **b) Serve Zone J load from remaining Zone J resources: 0 MW available**
    - **c) Serve Zone J load from surplus zones:**
13,055 – 10,456 = 2,599 MW from Zones A, C, D, F, K
    - **Result: Zone J load served from each zone as follows:**

	A	B	C	D	E	F	G	H	I	J	K
J	5.1%	0.0%	8.4%	5.2%	0.0%	0.7%	12.4%	11.9%	0.0%	55.8%	0.4%

Leeds-PV Example

- **Monitor the change in flow on the overloaded element.**
- **A Nodal TDF is calculated for every load bus in NYCA.**
- **Nodal MW Flow the product of load and TDF**
- **Sample from Leeds-PV results:**

Bus	Name	KV	Zone	Subzone	TDF	Load	Flow
126741	S CREEK AS	13.8	J	CON_ED	0.06044	310.9	18.79080
126000	SHEN12	13.8	G	CENT_HUD	0.03922	30.1	1.18052
135344	KNGTSCRK	34.5	A	NGRD_WES	0.03490	1	0.03490
136794	OGDENSBG	115	E	NGRD_MVN	-0.00364	15.8	-0.05751
131723	SIDNEY46	46.0	E	NYSEG_EA	-0.01200	13.8	-0.16560

Method (continued)

3. **Identify the Contributing Loads and Flow**
   - ***A nodal load is a <u>Contributing Load</u> if the Nodal TDF is positive (i.e. flow increases in direction of nominal flow on overloaded element).***
   - ***The Nodal MW Flow for each load bus with a positive Nodal TDF is <u>Contributing Flow</u>.***
4. **Calculate Contributing Materiality Threshold**
   - ***Contributing Materiality Threshold represents the percentage of all Contributing Load that flows across the overloaded element.***
   - ***<u>Contributing Materiality Threshold</u> = Sum of all Contributing Flow / Sum of all Contributing Load***

Method (continued)

5. **Identify the Helping Loads and Flow**
   - ***A nodal load is a <u>Helping Load</u> if the Nodal TDF is negative or zero (i.e. flow increases in the opposite direction of nominal flow on overloaded element).***
   - ***The Nodal MW Flow for each load bus with a negative or zero Nodal TDF is <u>Helping Flow</u>.***
6. **Calculate Helping Materiality Threshold**
   - ***Helping Materiality Threshold represents the percentage of all Helping Load that flows across the overloaded element.***
   - ***<u>Helping Materiality Threshold</u> = Sum of all Helping Flow / Sum of all Helping Load***

Leeds-PV Example

- **Calculate Contributing Materiality Threshold**
  - ***Contributing Materiality Threshold* = Sum of all Contributing Flow / Sum of all Contributing Load**
  - ***Leeds-PV total Contributing Load = 30,506.7 MW***
  - ***Leeds-PV total Contributing Flow = 1,116.1 MW***
  - ***Leeds-PV Contributing Materiality Threshold = 1,116.1 / 30,506.7 = 0.03659***
- **Calculate Helping Materiality Threshold**
  - ***Helping Materiality Threshold* = Sum of all Helping Flow / Sum of all Helping Load**
  - ***Leeds-PV total Helping Load = 4,979.4 MW***
  - ***Leeds-PV total Helping Flow = -51.3 MW***
  - ***Leeds-PV Contributing Materiality Threshold = -51.3 / 4,979.4 = -0.01031***

Method (continued)

7. Calculate Material Subzone Flows

- ***Material Subzone Contributing Flow*: Summation of Contributing Flow for nodal load buses within the subzone with Nodal TDF greater than or equal to the Contributing Materiality Threshold.**
- ***Material Subzone Helping Flow*: Summation of Helping Flow for nodal load buses within the subzone with Nodal TDF less than or equal to the Helping Materiality Threshold.**
- ***Net Material Subzone Flow*: Summation of Material Subzone Contributing Flow and Material Subzone Helping Flow for each subzone.**

Method (continued)

8. **Calculate Allocated Flow for each subzone**
   - ***If the Net Material Subzone Flow for a subzone is positive, the <u>Allocated Flow</u> is equal to the Net Material Subzone Flow.***
   - ***If the Net Material Subzone Flow for a subzone is negative or zero, the Allocated Flow for that subzone is zero.***
9. **Check reasonableness of allocation**
   - ***If the total Allocated Flow is less than 60% of the total Contributing Flow, then the Contributing Materiality Threshold will be reduced until the total Allocated Flow is at least 60% of the total Contributing Flow***
10. **Calculate allocation % for each subzone**
    - ***Divide the total Allocated Flow for each subzone by the total of all Allocated Flow in NYCA.***

Leeds-PV Example

- **Identify Material Flows**
  - ***Any load with a TDF greater than or equal to the Contributing Materiality Threshold is identified as a material contributing load.***
  - ***Any load with a TDF less than or equal to the Helping Materiality Threshold is identified as a material helping load.***
  - ***For Leeds-PV, any load bus with a TDF greater than or equal to 0.03659 or less than or equal to -0.01031 would be material.***

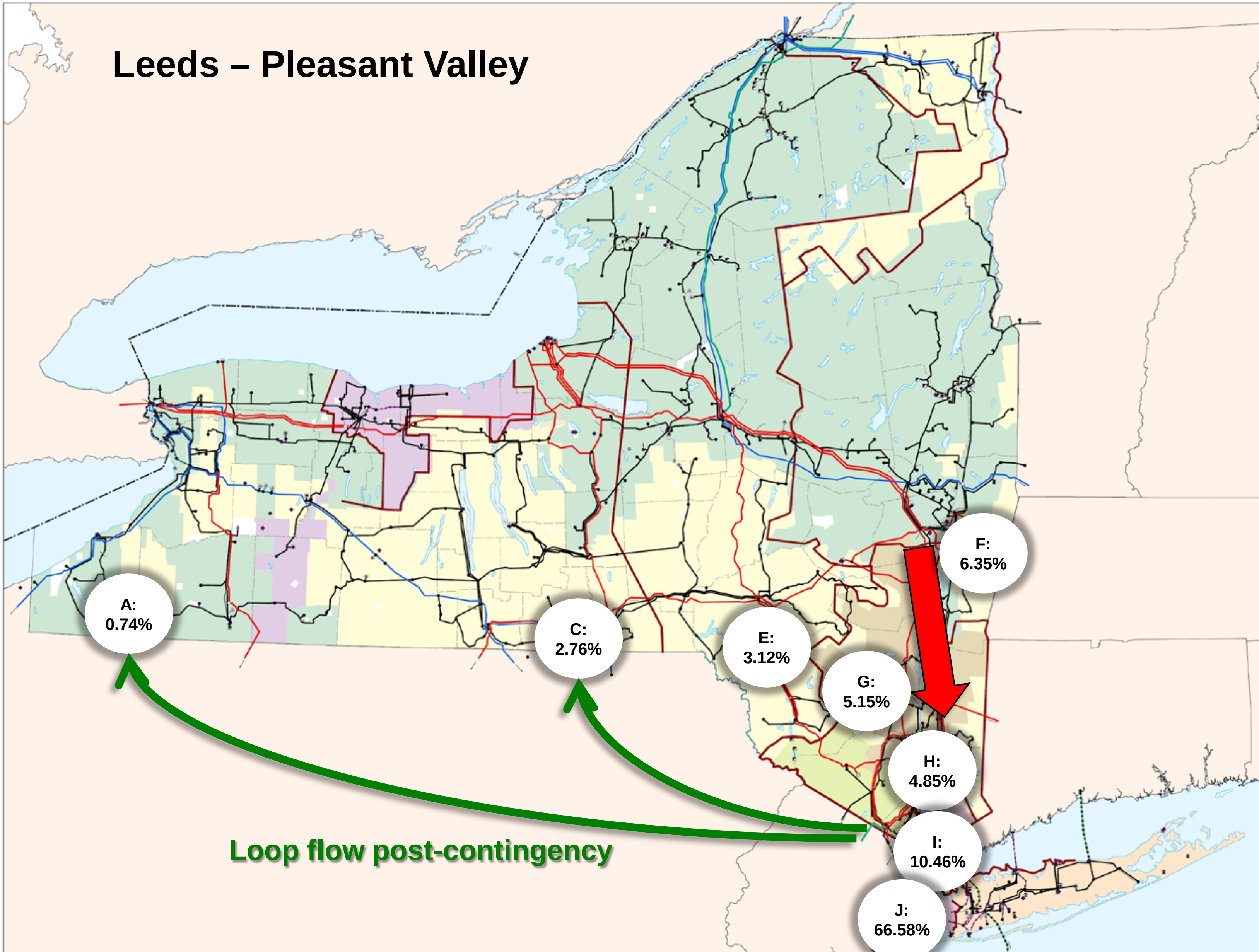
Bus	Name	KV	Zone	Subzone	TDF	Load	Flow	Material Flow
126741	S CREEK AS	13.8	J	CON_ED	0.06044	310.9	18.79080	18.79080
126000	SHEN12	13.8	G	CENT_HUD	0.03922	30.1	1.18052	1.18052
135344	KNGTSCRK	34.5	A	NGRD_WES	0.03490	1	0.03490	0.00000
136794	OGDENSBG	115	E	NGRD_MVN	-0.00364	15.8	-0.05751	0.00000
131723	SIDNEY46	46.0	E	NYSEG_EA	-0.01200	13.8	-0.16560	-2.28528

Leeds-PV Example

Zone	SubZone	Material Contributing MW	Material Helping MW	Net Material MW	Allocated MW	Allocation %
A	NGRD_WES	6.438052	0	6.43805	**6.438052**	**0.66%**
A	NYSEG_WE	0.1517	0	0.15170	**0.1517**	**0.02%**
A	NYPA_WES	0.61347	0	0.61347	**0.61347**	**0.06%**
B	RG_E	0	0	0.00000	**0**	**0.00%**
B	NYPA_B	0	0	0.00000	**0**	**0.00%**
B	NGRD_GNS	0	0	0.00000	**0**	**0.00%**
C	NGRD_CEN	0	0	0.00000	**0**	**0.00%**
C	NYSEG_CE	25.070166	0	25.07017	**25.070166**	**2.58%**
C	NYPA_C	1.731292	0	1.73129	**1.731292**	**0.18%**
D	NYPA_NOR	0	0	0.00000	**0**	**0.00%**
D	NYSEG_NO	0	0	0.00000	**0**	**0.00%**
D	NGRD_NTH	0	0	0.00000	**0**	**0.00%**
E	NGRD_MVN	0	-12.781295	-12.78130	**0**	**0.00%**
E	NYSEG_EA	33.660282	-3.342407	30.31788	**30.317875**	**3.12%**
E	NYPA_E	0	-1.80336	-1.80336	**0**	**0.00%**
E	CENT_H_C	0	-0.09306	-0.09306	**0**	**0.00%**
F	NGRD_EAS	52.228063	0	52.22806	**52.228063**	**5.37%**
F	NYPA_F	0	0	0.00000	**0**	**0.00%**
F	NYSEG_ME	9.461901	0	9.46190	**9.461901**	**0.97%**
G	NYSEG_HU	0	0	0.00000	**0**	**0.00%**
G	CENT_HUD	4.736227	-24.980474	-20.24425	**0**	**0.00%**
G	O_R	50.006657	0	50.00666	**50.006657**	**5.15%**
G	NYPA_G	0	0	0.00000	**0**	**0.00%**
G	CE_UPNY	0	0	0.00000	**0**	**0.00%**
H	NYPA_H	0	0	0.00000	**0**	**0.00%**
H	CON_ED_N	19.070725	0	19.07073	**19.070725**	**1.96%**
H	NYSEG_BR	28.017295	0	28.01730	**28.017295**	**2.88%**
I	NYPA_I	0	0	0.00000	**0**	**0.00%**
I	CON_ED_C	101.643288	0	101.64329	**101.643288**	**10.46%**
J	CON_ED	646.975488	0	646.97549	**646.975488**	**66.58%**
J	NYPA_J	0	0	0.00000	**0**	**0.00%**
K	LIPA	0	0	0.00000	**0**	**0.00%**
K	NYPA_K	0	0	0.00000	**0**	**0.00%**

NEW YORK INDEPENDENT SYSTEM OPERATOR

Leeds – Pleasant Valley



Multiple-Need Concept

- If a transmission solution or RMR addresses multiple BPTF thermal overloads, weighting factors will be calculated based on the ratio of estimated costs for individual solutions to each overload.
- Weighting factors would be applied to the allocations calculated for the individual needs.
- This approach is similar to the cost allocation method for interregional transmission projects, accepted by FERC
  - *Allocation of interregional transmission solution costs to each region calculated as the ratio of the costs of avoided regional solutions*
- See 2/3/2015 ESPWG presentation for example

Local Maximum Threshold

- If one subzone is allocated greater than 90% of costs (i.e., all other subzones less than or equal to 10%), then the thermal issue will be deemed local and related costs will not be allocated under the NYISO OATT, unless the solution is an RMR.

De Minimis Threshold

- If the calculation results in a subzone allocation less than the *de minimis* dollar threshold, the subzone will not be allocated costs. The total *de minimis* subzones may not exceed 10% of the total thermal cost allocation.
- Threshold is initially $10,000
- If the total calculated allocation percentage *of de minimis* subzones is greater than 10%, then the *de minimis* threshold will be reduced until the total is less than or equal to 10%.

Step 5: Local Cost Allocation

- FERC Order states that NYISO must be the entity that administers RMR service in New York.
- The scope of the NYISO reliability planning process is focused on reliability needs occurring on the BPTF, but the RMR order requires that the tariff allow for cost allocation and cost recovery for RMRs needed for reliability needs that are otherwise deemed to arise on TO local transmission systems.

Local Thermal Overload

- If there are non-BPTF thermal overloads after addressing BPTF, the necessary MW portion of the RMR will be allocated to the subzone in which the receiving terminal of the overloaded non-BPTF element is assigned.
- If multiple non-BPTF overloads are identified in multiple service territories, the MW portion of the RMR needed to address the non-BPTF thermal overloads would be allocated on a load-ratio share to each identified sub-zone.

Local Voltage Violation

- If there are voltage violations after addressing resource adequacy and thermal overloads, then the MW portion of the RMR necessary to resolve the voltage violations will be allocated on a load-ratio share to each sub-zone to which the violated substation is connected.

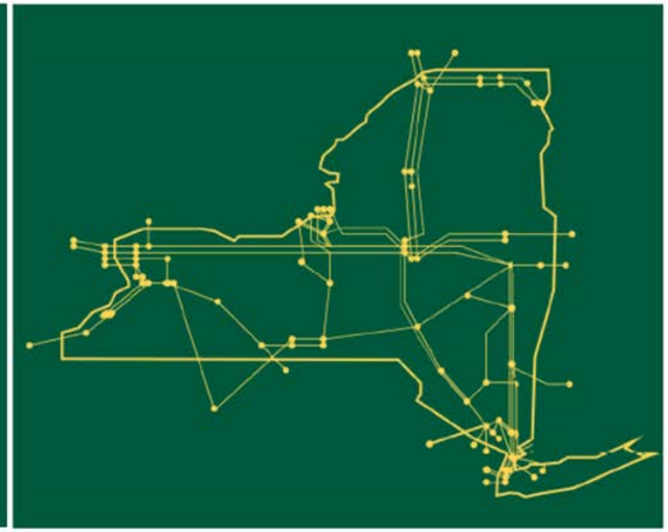
Dynamic Stability Violation

- If there are dynamic stability violations after addressing resource adequacy, thermal, and voltage, then the portion of the RMR necessary to resolve the stability violations will be allocated on a load-ratio share NYCA wide.

Next Steps

- **Review tariff language at 9/24 ESPWG**
- **RMR compliance filing 10/19**

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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