

2018 IRM Preliminary Topology

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May 30, 2017, KCC



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Agenda

- **IRM topology development**
- **2018 IRM topology: factors driving the changes**
- **Summary of 2018 IRM preliminary topology changes**
- **Next steps**

IRM Topology Development Process Highlights

- **Start from the prior year IRM final topology**
- **Identify major assumption changes from the prior year IRM**
- **Further review those interfaces impacted by the changes**
- **Review most recently completed studies (*e.g.*: RNA, ATR, Operating Studies) to identify if any areas of change**
- **Continue to analyze test results and assess impact of any assumption changes as the 2018 IRM base cases become available**

Primary Factors Driving the Topology Changes

- **CPV Valley plant (680 MW CRIS in Zone G)**
- **Freeport EQUS GT1 (PTID 23764) deactivation (48.3 MW CRIS in Zone K)**
- **NY-PJM Joint Operating Agreement (JOA) January filing**
- **External emergency assistance limit implementation**
- **Modeling enhancements**

Summary of 2018 IRM Preliminary Topology Changes

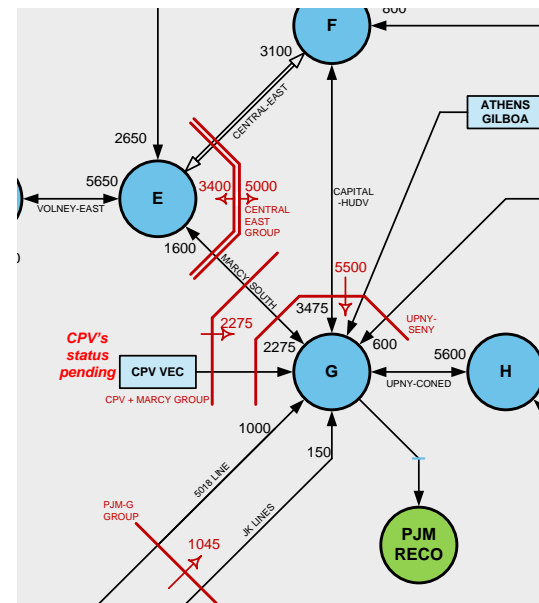
CPV Valley¹ Model

Same as the 2016 RNA implementation:

- Added new bubble containing CPV's MW capacity and a tie to Zone G.
- The impact on Marcy South is represented with a new interface group that combines E to G (Marcy South) and the tie from "CPV VEC" bubble to Zone G.
 - The new CPV_MarcySouth grouping has a limit of 2,275 MW.
 - The flow from the CPV VEC bubble has a coefficient of 0.9.
- The impact on UPNY-SENY interface is represented by including the flow from the CPV VEC bubble with a coefficient² of 0.3. The limit on the UPNY-SENY grouping is kept at 5,500 MW.

Notes:

- CPV Valley status – permits pending.
- A coefficient of 0.3 means that the UPNY_SENY grouping flow is reduced by 30% of CPV Valley flow at any time. As an example, if CPV at max of 677.6 MW, then up to 5,297 MW (=5,500 - 0.3x677.6) can flow through the UPNY-SENY interface.



Freeport GT1 Deactivation

- PSEG-LIPA identified the following topology changes as related with the 48.3 MW Freeport GT1 deactivation:
 - a decrease of 9 to 10 MW on the export limits of the ConEd-LIPA grouping, K to J interface, and LI-West grouping

External Emergency Assistance

- The NYSRC Executive Committee approved ICS' recommendation to set the external emergency assistance level into NYCA at 3,500 MW.

Changes related with the PJM-NY JOA

- The JOA specifies flow percentages to represent how power from PJM into NY will be scheduled across the transmission lines connecting the two systems.

PJM-NY JOA flow distribution % <i>(Jan 31, 2017 filing)</i>	RECO Load Deliveries	PJM-NY Emergency Assistance
PJM-NY Western Ties	20%	32%
5018 Line	80%	32%
JK Lines	0%	15%
A Line	0%	7%
BC Lines	0%	14%

- The flow percentages for PJM-NY EA are enforced by using three interface groups:
 - PJM-NY Western Ties Interface Group: 32%
 - PJM-G Interface Group: 47% (= 32% on 5018 line + 15% on J and K lines)
 - PJM-J Interface Group: 21% (= 7% on each of the A,B, and C lines)

Changes related with the PJM-NY JOA, cont.

- The assumed level of PJM - NY assistance for distribution on the PJM-NY non-UDR ties is 1,500 MW
 - The 2017 IRM assumed 1,000 MW
 - 1,500 MW is supported by the recent analysis to establish the 3,500 MW limit for the external assistance into NYCA.
- This value is multiplied by the above percentages to calculate the MW limit for each group.
 - This method was also applied for the 2017 IRM, with slightly different % values
- The limits for the first two groups are further increased to allow the RECO load delivery to flow through the interfaces without impacting the assumed emergency assistance limit, *e.g.*:
 - $47\% \times 1,500 = 705$ MW on PJM to G emergency assistance limit;
 - $705 + 340$ MW RECO delivery = 1,045 MW limit on the PJM to G grouping.

Modeling Enhancements

- Add a new J2 “dummy” bubble as an extension of PJM East
 - This provides for the representation of the electrical separation among the connections emanating from New Jersey (e.g.: J, K lines on the Zone G side, and A,B,C, HTP and VFT on the Zone J side) and improves the flow monitoring

Modeling Enhancements, cont.

- Separated VFT from J3 bubble: the A Line and the Linden VFT are now connected to Area J through the J3 bubble.
 - This separation allows for:
 - Better monitoring of flows,
 - Dynamic limits on the J_to_J3 path to reflect the impact of the status of the Staten Island generation (AK2&3 and Linden CoGen).
 - The flow distribution % described in the JOA is modeled by defining limits on the applicable interface groups
- The limits for the 5018, J, K, A, B, and C lines are all set to their line ratings with interface groups being used to enforce the JOA interchange distributions

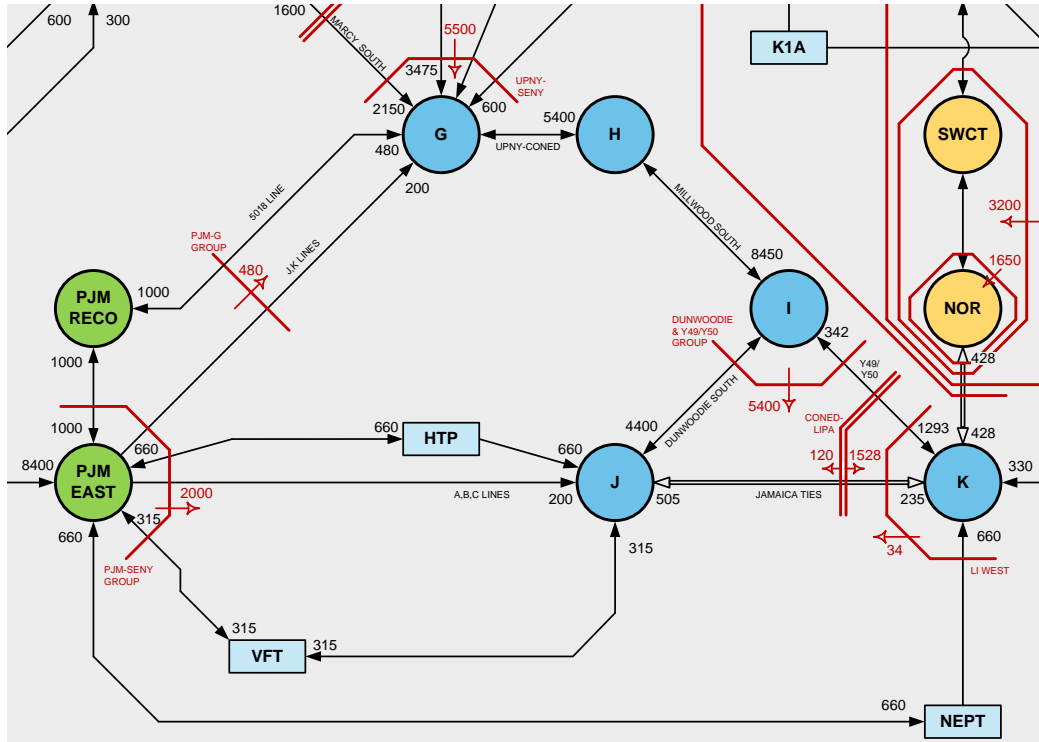
Modeling Enhancements, cont.

- RECO Load modeled as constant 425 MW load in its own bubble connecting radially to Zone G
 - This also allows for explicit modeling of 5018 Line
- Used the MARS firm contract feature to simulate RECO Load delivery from PJM_East through NY system, and using the JOA distributions:
 - 80% of the MW load delivered from the 5018 Line (=340 MW)
 - 20% flow from PJM-NY Western Ties (=85 MW)

Topology Changes

- The diagrams below focus on the locations of changes
- Diagram of complete preliminary topology is posted as a separate file

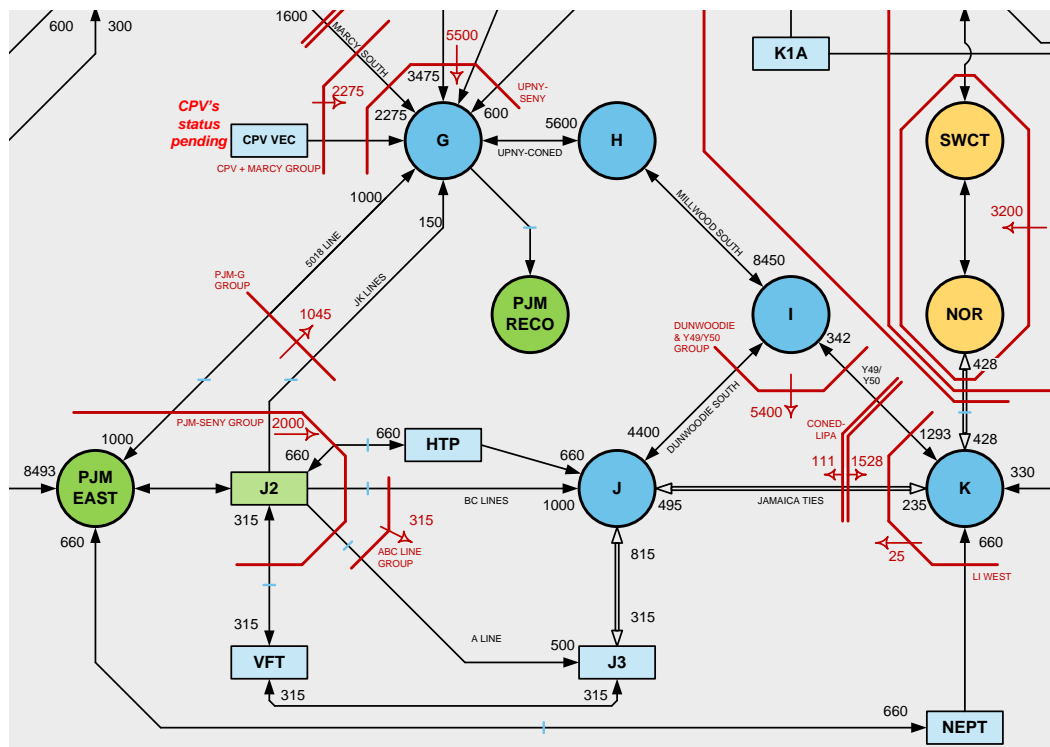
IRM 2017 Final Topology - Areas Impacted by the Changes



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IRM 2018 Preliminary Topology - Areas Impacted by the Changes



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Next Steps

- June 2 TPAS presentation
- Testing of the topology on the preliminary and final IRM cases
- Returning to ICS/TPAS if there are any changes from the preliminary topology presented today

Questions?

We are here to help. Let us know if we can add anything.

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