Ramapo Phase Angle Regulator Cost Recovery

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Agenda

- Background
- Benefits of Two Ramapo Phase Angle Regulators
- Annual Cost Projections
- Proposal
- Motion
- Next Steps

Background

- In 1993, members of the New York Power Pool (NYPP) and the PJM group (*i.e.*, certain PJM transmission owners) executed an agreement requiring Con Edison to purchase, install, own, and maintain two Phase Angle Regulators (PARs) at the Con Edison Ramapo Substation for the purposes of controlling power flows on the 500 kV Branchburg-Ramapo 5018 transmission line between the NYPP and PJM.
- The 1993 Ramapo PAR Agreement defines the monthly cost allocation terms associated with the two Ramapo PARs.
- The agreement requires its signatories to each pay for a portion of the Ramapo PAR costs.
    - 50% of the costs are allocated to members of the NYPP and 50% are allocated to the PJM group.

Background

- **On June 24, 2016, a fire at the Ramapo Substation resulted in the catastrophic failure of the Ramapo PAR #3500.**
  - There is currently only one PAR in operation at the Ramapo Substation
- **Con Edison is waiting for certainty on cost allocation prior to installing a replacement PAR at Ramapo.**

Joint NYISO/PJM Initiative

- The NYISO and PJM have commenced a joint stakeholder initiative to consider modifying the NYISO-PJM Joint Operating Agreement (JOA). This will address cost recovery and cost allocation for the expenses Con Edison incurs to maintain two Phase Angle Regulators at the Ramapo Substation
- The joint PJM-NYISO stakeholder initiative began March 9, 2017

Providing Cost Recovery will Accelerate Installation of the Second PAR

- NYISO believes there are significant benefits to both New York and PJM of maintaining two PARs at Ramapo. Delay in reaching agreement on interregional cost allocation should not be permitted to indefinitely delay the installation of a second PAR at Ramapo.
- Assuring Con Edison that it will be able to recover its costs after Con Edison installs and places in-service a second PAR at Ramapo is expected to accelerate the installation of a second PAR at the Ramapo Substation.

Benefits of Two Ramapo PARs

- **Reliability**
  - Reliability benefits in event of extreme contingencies or restoration
- **Economic**
  - Increased total energy import capability from PJM into NYISO with 2 PARs
  - Increased capability to direct PJM AC import schedules into eastern NY with 2 PARs
  - Increased real-time Market-to-Market capability
- **Minimum Installed Capacity Requirements**
  - Reduced Installed Reserve Margins & Locational Capacity Requirements

Reliability Benefits

- Beyond Criteria Events: Actual contingencies beyond minimum NERC Planning Criteria can and do occur. Both PJM and NYISO recognize higher levels of reliability during periods of extreme contingencies with two Ramapo PARs in-service.
  - Two Ramapo PARs reduce the risk of sustained, customer outages during extreme contingencies (severe thunder storms, ice storms, hurricanes, extreme conditions).
- Flexibility: The control capability provided by the two Ramapo PARs increases operational flexibility for NYISO. Power injections can be directed where needed for reliability.
- Restoration Resource: The Hopatcong-Ramapo 5018 line with two PARs in-service can provide tremendous support during a restoration event in either eastern NY or eastern PJM; as was the case in 2003.

Economic Benefits

- **Summer Import Scheduling Limits from PJM to NYISO**

  Two Ramapo PARs 1,750 MW

  One Ramapo PAR 1,400 MW

  Zero Ramapo PARs 1,000 MW (#5018 in-service, PARs bypassed)

- **Ramapo Target Flows – Post May 2017**

  Two Ramapo PARs 32% of PJM-NY AC schedule plus 80% of RECO

  One Ramapo PAR 16% of PJM-NY AC schedule plus 80% of RECO

Economic Benefits – Production Cost Simulation

- NYISO considered a "No Ramapo PARs" scenario to determine the production cost benefits NY realizes from two Ramapo PARs on the 500 kV Hopatcong – Ramapo 5018 interconnection

Economic Benefits – Production Cost Simulation

- **Base Case – Two Ramapo PARs**
  - Started with 2016 CARIS 2 Base Case
  - Assumed two Ramapo PARs in-service
  - Assumed Energy Import Scheduling Limit of 1750 MW
  - Only Evaluated Year 2018
  - Assumed ABC-JK 1000 MW wheel expired
    - Western ties carry 32% of PJM-NYISO AC Interchange
    - 5018 Line carry 32% of PJM-NYISO AC Interchange plus 80% RECO
    - PAR ABC to carry 21% of PJM-NYISO AC Interchange plus 400 MW OBF
    - PAR JK to carry 15% of PJM-NYISO AC Interchange minus 400 MW OBF

Economic Benefits – Production Cost Simulation

- **Sensitivity Case – No Ramapo PARs (Line 5018 in-service, PARS bypassed)**
  - Started with 2016 CARIS 2 Base Case
  - Assumed no Ramapo PARs in-service
  - Assumed Energy Import Scheduling Limit of 1000 MW
  - Only Evaluated Year 2018
  - Assumed ABC-JK 1000 MW wheel expired
    - Western & Line 5018 carry 64% of PJM-NYISO AC Interchange
    - PAR ABC to carry 21% of PJM-NYISO AC Interchange plus 400 MW OBF
    - PAR JK to carry 15% of PJM-NYISO AC Interchange minus 400 MW OBF

Economic Benefits – Production Cost Simulation

- Using the 2016 CARIS 2 database with the assumption on slides 15-16 resulted in;
  - $25 million in production cost benefits of two Ramapo PARs versus no Ramapo PARs
  - $100 million in NY Load Payment benefit of two Ramapo PARs versus no Ramapo PARs

Economic Benefits – Installed Capacity

- Based on 2017 IRM Study Report, the minimum Installed Reserve Margin (IRM) and Locational Capacity Requirements (LCRs) would increase with one Ramapo PARs assumed out-of-service:

Ramapo PARs In-Service	IRM	Zone J NYC	Zone K Long Island
2	118.1%	81.6%	103.5%
1	118.4%	81.8%	103.8%

- Potential capacity market impact of a reduction from two Ramapo PARs to one Ramapo PAR would result in approximately a $75 million impact across Rest of State, Zone J, and Zone K

Annual Cost Projection

- The preliminary, annual cost projection from the asset owner to install, maintain, and operate two PARs at the Con Edison Ramapo substation is approximately $5.5 million per year.

Commitment to Install Replacement PAR

- The asset owner will proceed with replacing the Ramapo PAR #3500 (the one destroyed in the June 2016 Ramapo fire) after an affirmative 58% vote at the NYISO Management Committee

NYISO Proposal

- NYISO proposes to make modifications to Rate Schedule 1 of its OATT whereby NY Transmission Customers would, on a going-forward basis (commencing on the effective date of the Tariff revisions), pay up to 100% of the charges associated with installing a second PAR at Ramapo and Con Edison's cost of owning, maintaining and operating the two Ramapo PARs
- Tariff revisions also provide for:
  - Transparency of the Ramapo PARs Charge
  - Potential partial refund of the Ramapo PARs Charge to NY Transmission Customers if PJM pays for part of the cost of the PARs

Con Edison's Ramapo PARs Charge

- **Con Edison will calculate the Ramapo PARs Charge in accordance with the 1993 PARs Facilities Agreement**
  - Filed in FERC Docket No. ER93-640 on May 10, 1993
- **NY Transmission Customers will commence reimbursing Con Edison on a going-forward basis, for**
  - Up to 100% of the costs to acquire and install a replacement for the 3500 PAR, and
  - Up to 100% of the going-forward costs to own, operate and maintain both Ramapo PARs
  - If PJM assumes an obligation to pay a portion of the Ramapo PARs Charge, the NY Transmission Customers obligation will be reduced by that amount
- **Con Edison will not submit a charge that would cause NY Transmission Customers to pay more than 50% of the cost of replacing the 4500 PAR or more than 50% of the charges Con Edison issued for the 4500 PAR prior to the effective date of these proposed tariff revisions**

Transparency of the Ramapo PARs Charge

- NYISO will post on its website the itemized monthly bill (for the preceding month) it receives from Con Edison that determines the Ramapo PARs Charge
- By August 1 of each year, Con Edison will prepare and NYISO will post on its website an estimate of the monthly costs and expenses associated with the Ramapo PARs for the next calendar year and for each of the four subsequent years
- Con Edison will maintain books and records related to its calculation of the Ramapo PARs Charge, including costs incurred
  - Such books and records will be subject to review by the NYISO's Transmission Customers
  - NYISO will not audit the monthly bills, books or records prepared by Con Edison for the Ramapo PARs Charge

Potential Refund of the Ramapo PARs Charge

- **If NYISO receives a refund from Con Edison, or a payment from PJM or PJM TOs related to the Ramapo PARs Charge, the NYISO will refund the amount received to its Transmission Customers**
  - Any refunds will be allocated to Transmission Customers based on their market participation during the Billing Period in which the refund is paid using the same load ratio share basis used to allocate the *NonISOFacilitiesCosts* charges to Transmission Customers

Next Steps

- May 31 MC
- July NYISO Board of Directors
- July FERC filing
- The replacement for the 3500 PAR is expected to be in service in September 2017
- Continued joint NYISO-PJM stakeholder discussions on regional benefits and regional cost allocation

The Mission of the New York Independent System Operator is to:

- **Serve the public interest and**
- **Provide benefit to stakeholders by**
  - Maintaining and enhancing regional reliability
  - Operating open, fair and competitive wholesale electricity markets
  - Planning the power system for the future
  - Providing factual information to policy makers, stakeholders and investors in the power system

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