Generator Interconnection Low Voltage Network Upgrade Cost Recovery

Issue paper & straw proposal

August 1, 2016

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1 Introduction and Background

The ISO tariff requires Participating Transmission Owners (PTOs) to reimburse interconnection customers (ICs) whose generators are interconnecting to their systems for the costs of reliability[1] and local deliverability network upgrades necessary for the interconnection. The PTOs then include those network upgrade reimbursement costs in their regulator-approved rate bases, requiring ratepayers to pay those costs through either low- or high-voltage transmission access charges (TAC). Network upgrades 200 kV and above are considered high-voltage and upgrades below 200 kV are considered low-voltage. The high-voltage TAC is a "postage stamp rate" based on the aggregated transmission revenue requirements ("TRR") of all PTOs for all high-voltage facilities on the ISO system. In contrast, the low-voltage TAC is PTO-specific, charged only to customers within the service area of the PTO who owns the facilities. As such, if a large generator or a large number of generators with significant low-voltage network upgrade costs interconnect to a PTO with a relatively small rate base, that PTO's rate base may increase significantly and can result in rate shock to its ratepayers.

The requirement for the individual PTO to reimburse low-voltage network upgrade costs is unrelated to where the interconnecting generators intend to sell their energy or capacity. Thus a PTO with a relatively small rate base could experience a significant cost increase related to the interconnection of generators that intend to supply load-serving entities located throughout the ISO footprint. In such circumstances passing these large costs entirely to the small PTO's ratepayers can result in a substantial increase to the local or low-voltage TAC rate, even when the local ratepayers may not receive commensurate benefit from the added generation.

This issue has come to light recently in the Valley Electric Association (VEA) area. There are a number of generation developers seeking to connect hundreds of MWs of renewable generation to the VEA 138 kV system that will require tens of millions of dollars in network upgrades on that system. As an example, adding $25 million of costs to VEA's low-voltage rate base would increase VEA's low-voltage TAC rate by over 90 percent for a system whose annual peak load is only approximately 124 MW. The ISO agrees that this would impose an unreasonable impact on VEA's ratepayers and is therefore opening this initiative to consider alternatives. Although this initiative was triggered by the need to limit extreme impacts on a small PTO's low-voltage TRR and TAC, the options presented in this paper would be applied to all PTOs in the ISO system.

[1] Reimbursement for reliability network upgrades (RNU) is limited to $60,000 per installed MW of capacity; there is no limit on reimbursement for costs of other qualifying network upgrades.

2 Stakeholder process

Timely resolution of this issue is critical as there are many interconnection customers that are currently in the study process or generation interconnection agreement (GIA) negotiation phase and are dependent on the outcome of this stakeholder process. Therefore, the ISO has set out the following accelerated stakeholder process schedule and appreciates stakeholder understanding and participation in this effort.

Stakeholder process schedule

Step	Date	Activity
Draft Issue Paper/Straw Proposal	August 1, 2016	Post Issue Paper/Straw Proposal
	August 8, 2016	Stakeholder web conference
	August 19, 2016	Stakeholder comments due
Revised Straw Proposal	September 6, 2016	Post Revised Straw Proposal
	September 13, 2016	Stakeholder web conference
	September 20, 2016	Stakeholder comments due
Draft Final Proposal	October 3, 2016	Post Draft Final Proposal
	October 10, 2016	Stakeholder web conference
	October 17, 2016	Stakeholder comments due
Board approval	December 14/15, 2016	ISO Board of Governors meeting

3 Straw Proposal

The ISO has carefully considered this issue and is proposing the options discussed below for stakeholder consideration. Each option will require tariff changes. Importantly, the ISO believes that it is essential that any solution to this issue be compatible with and retain the fundamental design and features of the Generation Interconnection and Deliverability Allocation Procedures (GIDAP), Appendix DD of the ISO Tariff, specifically:

- Two-phase cluster-study approach with annual reassessments;
- Cost certainty to interconnection customers early in the study process through cost caps; and
- Reliability and local deliverability network upgrades would continue to be reimbursed to interconnection customers upon commercial operation in accordance with the GIDAP.

For this reason, the ISO is not proposing options that would, for example, shift network upgrade costs to the interconnection customers who trigger them. Doing so would represent a fundamental paradigm shift for generation development and capacity procurement in the ISO region, and likely would raise some of the myriad issues with which other regions struggle.[2]

Options 1 and 2 provide two approaches for mitigating potentially large impacts of low-voltage interconnection-driven upgrades on the ratepayers of a small PTO. Either option would, of course, apply consistently to all PTOs. Under these proposals the PTOs would maintain their cost allocations for generator-triggered network upgrades already in service, and would apply whichever option is adopted going forward. The transition could, for example, be based on any network upgrades not in service at or near the time the revised tariff provisions go into effect. In any case, the CAISO proposes that revisions resulting from this stakeholder process would have immediate effect on a going-forward basis.

Option 1 – Include the cost of generator-triggered low-voltage facilities in the PTO's high-voltage TRR for recovery through the high-voltage TAC. This option recognizes that generators provide energy to the ISO markets for the entire region, and generally support public policy goals including resource adequacy, reliability, and renewable generation. The conceptual approach here is that once interconnected to the ISO controlled grid (whether above or below 200 kV), it is connected to the ISO market and benefits all ISO ratepayers, not just those in the local area. This option would apply to all PTOs, is straightforward, and would be fairly simple to implement.

For reference, there are currently 90 active generation interconnection projects in the CAISO queue with executed Generation Interconnection Agreements (GIAs). There also are a number of projects that are currently in GIA negotiations with PG&E, SCE, SDGE and VEA. Table 1 below shows the estimated dollar amount for low- and high-voltage reliability and local deliverability network upgrade costs for 90 active projects with executed GIAs in the CAISO interconnection queue and 5 projects interconnecting to VEA that have either Phase-I or Phase-II cost information for network upgrades. VEA has yet to execute a GIA.

Table 1

Estimates of Low & High-Voltage RNU and LDNU Costs ($ millions)

PTO	Number of active projects with executed GIAs	Total estimated Low-voltage (<200kV) network upgrade costs	Total estimated high-voltage (≥200kV) network upgrade costs
PG&E	38	$76.23	$77.36
SCE	34	$1.85	$696.23
SDGE	18	$7.49	$30.82
VEA	5[3]	$9.12	$17.46

[2] *See* American Wind Energy Association, Petition for Rulemaking, FERC Docket No. RM15-21-000 (July 7, 2015).
[3] Since VEA has yet to execute a GIA the amounts shown are for the 5 active VEA projects that have either Phase-I or Phase-II cost information for network upgrades.

Also for reference, Table 2 shows the current annual low and high-voltage TRRs as of 3/1/2016.

Table 2[4]

Current Annual Low & High-Voltage TRRs as of 3/1/2016

PTO	Filed Annual HV TRR ($)	Filed Annual Gross Load (MWh)	HV Utility Specific Rate ($/MWh)	TAC Rate	TAC Amount	Filed Annual LV TRR ($)	LV Utility Specific Rate ($/MWh)	Utility Specific Combined TAC
PG&E	$607,131,854	90,445,937	$6.7126	$11.1337	$1,006,995,411	$769,307,250	$8.5057	$15.2184
SCE	$1,004,417,227	90,511,765	$11.0971	$11.1337	$1,007,728,318	$40,241,005	$0.4446	$11.5417
SDGE	$469,609,354	20,824,991	$22.5503	$11.1337	$231,858,623	$298,854,329	$14.3508	$36.9010
Anaheim	$29,372,296	2,507,620	$11.7132	$11.1337	$27,919,019			$11.7132
Azusa	$3,163,102	257,416	$12.2879	$11.1337	$2,865,985			$12.2879
Banning	$1,274,841	144,652	$8.8132	$11.1337	$1,610,508			$8.8132
Pasadena	$14,679,975	1,231,980	$11.9158	$11.1337	$13,716,461			$11.9158
Riverside	$32,665,860	2,180,985	$14.9776	$11.1337	$24,282,372			$14.9776
Vernon	$2,973,458	1,181,728	$2.5162	$11.1337	$13,156,972			$2.5162
DATC Path 15	$25,407,824			$11.1337				
Startrans IO	$3,587,536			$11.1337				
TBC	$118,857,411			$11.1337		$9,117,184	$0.1008[5]	
Citizens Sunrise	$11,783,984			$11.1337				
Colton	$3,485,980	372,179	$9.3664	$11.1337	$4,143,719			
VEA	$11,934,201	544,970	$21.8988	$11.1337	$6,067,517	$3,413,410	$6.2635	$28.1623
Total	$2,340,344,903	210,204,223	$11.1337		$2,340,344,906	$1,120,933,178		$3,461,278,084

[4] This table can be found in the following document: http://www.caiso.com/Documents/HighVoltageAccessChargeRatesEffectiveMar1_2016.pdf

[5] The LV utility specific rate for TransBay Cable is derived by dividing the LV TRR by PG&E's gross load, as Trans Bay Cable does not have a load service area, and its low voltage costs are recovered from PG&E customers.

If VEA required $25 million in low voltage network upgrade costs, the approximate impact on VEA's low-voltage TAC would be an increase of about $5.87/MWh (from $6.26/MWh to $12.13/MWh), a 94% increase.[6] As mentioned above, this would be a significant impact on VEA ratepayers for facilities that do not provide VEA ratepayers with a commensurate benefit. However if this $25 million were shared across the system and reflected in the high-voltage TAC rate, it would be an increase of $0.0152/MWh (from $11.1337/MWh to $11.1489/MWh), a 0.14% increase shared by all ISO ratepayers.[7]

Because this option would be applied to all PTOs, not just VEA, if PG&E required that same $25 million for low voltage network upgrade costs, the approximate impact on PG&E's low-voltage TAC would be an increase of about $0.0355/MWh, from $8.5057/MWh to $8.5412/MWh, a 0.4% increase.[8]

Option 2 – Split the cost recovery for low-voltage interconnection-driven upgrades between the low-voltage and high-voltage TAC. The split would depend on one of the following approaches to limit increases in a PTO's low-voltage TRR or TAC, with any additional TRR above the limit added to the PTO's high-voltage TRR.

a) Place a cap on the share of interconnection-driven upgrades in each PTO's low-voltage rate base (low-voltage transmission original cost less depreciation). The cap could be based on one-year and/or multi-year calculations (e.g., no more than X% increase annually and/or Y% every five years, where X < Y).

b) Limit the incremental revenue requirement increase due to interconnection-related upgrades as a percentage of the PTO's low-voltage annual TRR (using a model like the incremental revenue requirement model the ISO uses in annual TAC calculations). Basing the limit on the impact on TRR, rather than on net rate base, provides a more direct assessment of impact on customers, as not all revenue requirement costs are derived directly from rate base.

c) Limit the incremental revenue requirement increase due to interconnection-related network upgrades as a percentage of the high voltage TAC revenue recovered from the PTO's customer base (for load serving PTOs). This last method would make sense because it limits exposure of a local area group of customers to a percentage of their high voltage TAC payments. As such, a utility twice the size of another could reasonably absorb twice the local impact of interconnection-related low

[6] The ISO estimated the impact of a $25 million capital expenditure utilizing the existing spreadsheet model used to estimate the impact of transmission capital expenditures on the Regional (High Voltage) Transmission Access charge and employed in the 2015-2016 Transmission Plan. The assumptions are consistent with that model, and using a 10% ROE and 5% social discount rate. The impact over the first 10 years was levelized over the 10 year period, including the mid-year impact on rate base of the first year of operation. This produced an estimate of $3.2 million annual levelized revenue requirement, or 12.8% of the capital expenditure. This provides a reasonable approximation of the impact – which varies in each year due to depreciation and other impacts. $3.2 million divided by the VEA load of 544,970 MWh is $5.87/MWh.

[7] $3.2 million divided by total ISO load of 210,204,223 MWh equals $0.0152/MWh.

[8] $3.2 million divided by PG&E load of 90,445,937 MWh equals $0.0354/MWh

voltage network upgrades compared to a utility with a much smaller customer base. Separating this percentage from the low-voltage rate base thus avoids the complexity of two utilities like PG&E and SCE having different approaches that lead to different amounts of sub-transmission costs being recovered through the local (low-voltage) TAC versus being considered distribution tariffs, or utilities that happen to have more or less sub-transmission for relatively comparable loads.

Table 3 illustrates a Comparison of a 5% limit for Option 2b (limit based on local TRR) versus Option 2c (limit based on high voltage TAC revenue collection). Note that Option 2a would have very similar results to Option 2b.

<u>Table 3</u>

Comparison of a 5% Limit for Option 2b versus Option 2c
(Option 2a would have similar results to Option 2b)

				Impact of 5% Limit				
				Based on Local TRR (Option 2-b)			Based on Regional TAC revenue (Option 2-c)	
Utility	Local Low-Voltage Revenue Requirement	Regional High Voltage TAC revenue collected		Limit on incremental Annual LV TRR impact	Limit on LV upgrade capital costs assigned to the PTO *		Limit on incremental Annual LV TRR impact	Limit on LV upgrade capital costs assigned to the PTO *
PG&E	$769,307,250	$1,006,995,411		$38,465,363	$300,510,645		$50,349,771	$393,357,582
SCE	$40,241,005	$1,007,728,318		$2,012,050	$15,719,143		$50,386,416	$393,643,874
VEA	$3,413,410	$6,067,517		$170,671	$1,333,363		$303,376	$2,370,124
Limit	5%							
* assuming annual TRR is approximately 12.8% of the capital investment								

4 Next steps

As a next step, the ISO will conduct a conference call to discuss this issue paper and straw proposal on August 8. The ISO then invites stakeholders to submit comments on the ISO's draft issue paper/straw proposal. Comments are due August 19 and should be submitted to InitiativeComments@caiso.com.

Following review and evaluation of the comments received, the ISO will consider potential revisions to its proposal and issue a revised straw proposal on September 6.