Resource Adequacy Deliverability for Distributed Generation

2016-2017 DG Deliverability Assessment Results

February 14, 2017

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1 Introduction

In accordance with the ISO tariff section 40.4.6.3, the ISO performed the 2016-2017 Distributed Generation Deliverability (DGD) assessment to determine MW quantities of Potential DGD at specific nodes of the CAISO Controlled Grid for assigning deliverability status to Distributed Generation (DG) Facilities.

Section 2 of this paper provides a high level summary of the study results for each participating transmission owner (PTO) service territory. The study model used by the ISO in conducting the annual DG deliverability assessment is described in section 3. Section 4 describes how the Potential DGD at each node is determined. Section 5 provides information intended to help make the detailed results easier to understand.

The detailed results are contained in worksheets attached to this report.

2 DG deliverability assessment results summary

The 2016-2017 DG deliverability assessment results indicate that a total of 1,950.46 megawatts of Potential DGD is available at nodes on the ISO grid for assignment of deliverability status to DG resources[1] connected or requesting interconnection below those nodes. The total Potential DGD for each PTO service territory is summarized in the following table. Of these total quantities, some amounts of Potential DGD at specific nodes will be available to municipal utility distribution companies (UDC) for assignment of deliverability status to DG resources on their distribution systems.

[1] For purposes of this study, DG refers to generation resources connected to utility distribution systems. The ISO recognizes that, in some contexts, some parties use the term "distributed generation" to mean resources of certain technology types or below certain size thresholds, and may even include such categories of resources when they are connected to the transmission system. For purposes of this study, however, the term "distributed generation" refers to all generation resources connected to utility distribution systems, without regard to size or resource type.

PTO service territory	Total MW of Potential DGD
SCE	1,323.89
SDG&E	28.48
PG&E	598.09
VEA	0
Total	1950.46

The detailed nodal amounts of Potential DGD within each PTO service territory are provided in worksheets attached to this report. The following three sections provide a summary of the results for each PTO service territory.

2.1 SCE service territory

There were 35 nodes studied for Potential DGD in the SCE service territory.[2] The study determined that a total of 1323.89 megawatts of Potential DGD is available at the 35 nodes including the Potential DGD that was identified but not assigned in the previous DGD cycle.

In the SCE service territory, there are four ISO grid nodes with Potential DGD where municipal utility load is served off of their respective distribution systems.[3] These four nodes are

- "Laguna Bell" with 10.00 MW of Potential DGD (shared between SCE and City of Vernon)
- "Mira Loma" with 35.99 MW of Potential DGD (shared between SCE and City of Corona)
- "Vista" with 45.47 MW of Potential DGD (shared between SCE, Riverside and City of Colton)

The Potential DGD (PDGD) is allocated to each load serving entity in proportional to their load share at the node.

Node	PDGD	LSE-1			LSE-2			LSE-3		
		Name	%	PDGD	Name	%	PDGD	Name	%	PDGD
LAGUNA BELL	10	SCE	76.71%	7.67	City of Vernon	23.29%	2.33			
MIRA LOMA	35.99	SCE	96.03%	34.56	City of Corona	3.97%	1.43			
VISTA	45.47	SCE	45.33%	20.61	Riverside Public Utility	47.81%	21.74	City of Colton	6.86%	3.12

[2] These are the nodes at which DG is designated in any of the resource portfolios used in the ISO's 2016-2017 Transmission Planning Process. This is a subset of the total nodes represented in the power flow model in the SCE service territory. This same situation also applies in the case of PG&E and SDG&E.

[3] The load represented is based on the CEC's 2021 coincident peak demand forecast.

In the SCE service territory, there are five nodes where the distributed generators contribute to overloads that trigger Special Protection Scheme (SPS) action. Assuming the participation of the generators at the node for the proposed or existing SPS, the deliverable Megawatt for these generators was determined by the next constraint identified in the studies. The Potential DGD should only be assigned to distributed generators that participate in the associated RAS.

- "Kramer" with 19.2 MW of Potential DGD if the DG is participating in the existing Mohave Desert RAS and High Desert Power Plant RAS.
- "Rector" with 82.56 MW Potential DGD if the DG is participating in the existing Big Creek/San Joaquin RAS.
- "Springville" with 46.50 MW of Potential DGD if the DG is participating in the existing Big Creek/San Joaquin RAS.
- "Vestal" with 173.94 MW of Potential DGD if the DG is participating in the existing Big Creek/San Joaquin RAS.
- "Victor" with 168.68 MW of Potential DGD if the DG is participating in the existing High Desert Power Plant RAS.

2.2 SDG&E service territory

There were 27 nodes studied for Potential DGD in the SDG&E service territory (see footnote 2). The study determined that a total of 28.48 megawatts of Potential DGD is available at the studied nodes including the Potential DGD that was identified but not assigned in the previous DGD cycle.

2.3 PG&E service territory

There were 478 nodes studied for Potential DGD in the PG&E service territory (see footnote 2). A total of 598.09 megawatts of Potential DGD is available for assignment of deliverability status to DG resources at 154 of the 478 nodes. There is none available at the remaining 324 nodes, either because (i) there was no DG designated at these nodes in the base portfolio utilized in the ISO's annual transmission planning process and there was no energy-only interconnection requests in a WDAT/Rule 21 queue, or (ii) because of deliverability constraints.

In the PG&E service territory, there were five nodes with Potential DGD where only municipal utility load is served. There were no ISO grid nodes with Potential DGD at which both PG&E and municipal utility load is served.

2.4 VEA service territory

There was no DG node in VEA service territory.

3 DG deliverability assessment study model

The study model used by the ISO in the assessment was developed from the most recent ISO generation interconnection deliverability assessment base case. The first step was to model the transmission systems and prior commitment of deliverability that generally included:

i. Generators that are operational and have obtained Full Capacity Deliverability Status (FCDS) or Partial Capacity Deliverability Status (PCDS)[4], including the ones obtained FCDS or PCDS in the previous DGD cycles;
ii. Active generation interconnection requests in the ISO's and Participating TOs' generation interconnection queues that requested Full Capacity Deliverability Status or Partial Capacity Deliverability Status in Queue Cluster 9 window or earlier;
iii. Generation projects that have obtained deliverability using the annual full capacity deliverability option;
iv. Generation projects that have obtained deliverability in the previous deliverability status assignment;
v. The MW amount of Potential DGD that was identified but not assigned in 2015-2016 DGD cycle, i.e. 2016 unassigned PDGD;
vi. Transmission upgrades that have been approved in ISO Transmission Planning Process;
vii. Network Upgrades required for any generation interconnection requests that are under construction or have received regulatory permits.

Next, target DG amounts were determined and added to the study model following the steps described below.

i. Identify all DG nodes that have non-zero distributed generation MW in one of 2016-2017 Transmission Plan renewable portfolios.
ii. At each DG node, determine the target additional DG amount. The target additional DG amount at each node was initially set to {*total existing Energy Only DG[5] + the greatest of the (a) and (b) below*}:
    a. Maximum DG MW at the node among all renewable portfolios
    b. Total MW amount of non-NEM WDAT or Rule 21 requests

    The target amount was set to 0 at a node if any of the following two conditions was true:

    - If the node is within an electrical area for which the Queue Cluster 9 Phase I interconnection studies have showed a need for a Delivery Network Upgrade;

[4] These generators may not have achieved FCDS or PCDS due to required Network Upgrades not in service yet.
[5] For the purpose of this study, Energy Only DG includes any DG that has requested Energy Only Deliverability Status and not previously obtained Full Capacity Deliverability Status or Partial Capacity Deliverability Status, as well as the portion of a DG that would bring the DG from Partial Capacity Deliverability Status to Full Capacity Deliverability Status.

- If the node is within an electrical area for which a Delivery Network Upgrade was identified and then removed in Queue Cluster 3 and 4 Phase II interconnection studies, and the constraint driving the Delivery Network Upgrade is still binding for Queue Cluster 3 and 4 in the Queue Cluster 9 Phase I interconnection studies.

The total MW modeled at a node is equal to {max (target MW, 2016 unassigned PDGD)}.

iii. If a DG node is found to be behind a constraint for which there is an existing SPS, the node will be identified to have conditional PDGD subject to verification from PTO for whether or not any DG at that node needs to be included in the SPS from a reliability perspective and if it is feasible.

4 DGD determination

This ISO performed deliverability assessment determined the amount of deliverable MW at each node. Part or all of the deliverable MW amount determined was then identified as Potential DGD for assigning Deliverability Status to Distributed Generation Facilities. In general, the Potential DGD is the deliverable MW amount, minus any prior commitments, that does not exceed the sum of existing Energy Only DG and future Energy Only DG. If the initially identified Potential DGD is lower than the 2016 unassigned Potential DGD, the 2016 unassigned Potential DGD is preserved.

Potential DGD = max {2016 unassigned PDGD, min {deliverable MW, existing EO + max {base portfolio, EO interconnection requests} } }

5 Detailed DG deliverability assessment results

The detailed results are attached to this report. There is one worksheet for each PTO service territory. The following is a listing of the column headings used in the worksheet along with a brief explanation of each.

A. **DG Node—Substation Name**. Name of the substation representing the DG node.
B. **DG Node—Transmission Level kV**. The transmission level voltage at the transmission/distribution interface.
C. **DG in Base Portfolio**. The megawatts of DG at the node in the base portfolio utilized in the ISO's 2016-2017 Transmission Planning Process.
D. **WDAT/Rule 21 non-NEM DG—EO**. The total megawatts of non-NEM DG at the node in the WDAT queue that have requested Energy Only Deliverability Status and not obtained deliverability previously.
E. **WDAT/Rule 21 non-NEM DG—FC**. The total megawatts of non-NEM DG at the node in the WDAT or Rule 21 queue that have requested or obtained deliverability.

F. **Existing non-NEM DG—EO**. The total megawatts of non-NEM DG at the node already in commercial operation that have not obtained deliverability.
G. **Existing non-NEM DG—FC**. The total megawatts of non-NEM DG at the node already in commercial operation that have obtained deliverability.
H. **2016 Unassigned PDGD**. The total megawatts of Potential DGD identified but not assigned in the 2015-2016 DG deliverability cycle.
I. **Target DG Modeled**. The total megawatts of DG modeled at the node in the DG deliverability assessment.
J. **DG Deliverable**. The total megawatts of DG determined to be deliverable at the node.
K. **Potential DGD**. The total megawatt amount of Potential DGD at the node available for assignment of deliverability status to DG resources. Potential DGD is calculated as Max (Column H, Min (Column J, Column F + Max (Column C, Column D))).
L. **Notes.** Comments to help understand the results.