SCE Comments

Submitted by	Company	Date Submitted
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Southern California Edison (SCE) files these comments in response to the April 26, 2016 CAISO Stakeholder Call and the associated presentation materials the CAISO has shared. SCE supports the CAISO's efforts to work collaboratively with stakeholders to clarify the "pre-dispatch" requirements for resources that cannot be dispatched post-contingency to meet reliability planning requirements. SCE's comments focus on two areas: 1) general comments on the presentation and the CAISO efforts; and 2) clarifications on the "Method 1" approach that will be performed by the Participating Transmission Owners (PTOs).

General Comments

SCE suggests a few clarifications for the study plan and materials. The CAISO should clarify that this study focuses on DR resources that are not capable of being dispatched post-contingency due to their notification (response) time, while recognizing that there are DR resources that are capable of such dispatch (i.e. not all DR is "slow-response" DR). Furthermore, while this stakeholder process has been kicked off within the Transmission Planning Process (TPP), the CAISO should work closely with the California Public Utilities Commission (CPUC) to coordinate with the Resource Adequacy (RA) proceeding, and ensure that the Load Serving Entities (LSEs) have a consistent set of regulatory requirements for Resource Adequacy and Transmission Planning purposes.

Method 1 Clarifications

For the benefit of the stakeholders in this process, SCE hereby provides additional details on the proposed study steps under the "Method 1" approach. As discussed on the call, the PTOs would first perform the analysis, and share it with the CAISO and the stakeholders. The CAISO would then have the option to verify these results by performing the "Method 2" approach.

In the attached presentation, additional details and initial results from the three IOUs are provided. The proposed methodology starts with the one-in-ten load forecast target, and scales historical loads to the target level. Several levels of Demand Response (DR) are assumed, and the expected resulting dispatch frequency is recorded. The methodology looks at various possible levels (MW) of DR, and calculates the associated requirements, where a higher volume of DR implies a more frequent use, and therefore a more stringent set of requirements.

The study will be performed for all the Local Capacity Areas and Sub-Areas, and it may indicate different regional requirements due to differing load shapes and DR penetration. This information can then be used to inform the Transmission Planning Process as well as the DR program design.

SCE appreciates the opportunity to provide comments, and looks forward to working collaboratively with the stakeholders in completing this study and clarifying the pre-dispatch requirements for "slow" DR resources.

Determination of “Pre-Dispatch” Requirements for DR to Meet Local Capacity Needs

Draft Methodology

April 2016

Agenda

- Review Proposed Methodology
  - Background
  - Proposed approach
- SCE Example (Rector Sub Area)
- PG&E Example (Sierra Sub Area)
- Next Steps

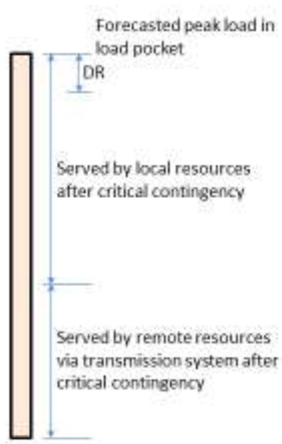
2016 CAISO LOCAL CAPACITY TECHNICAL ANALYSIS

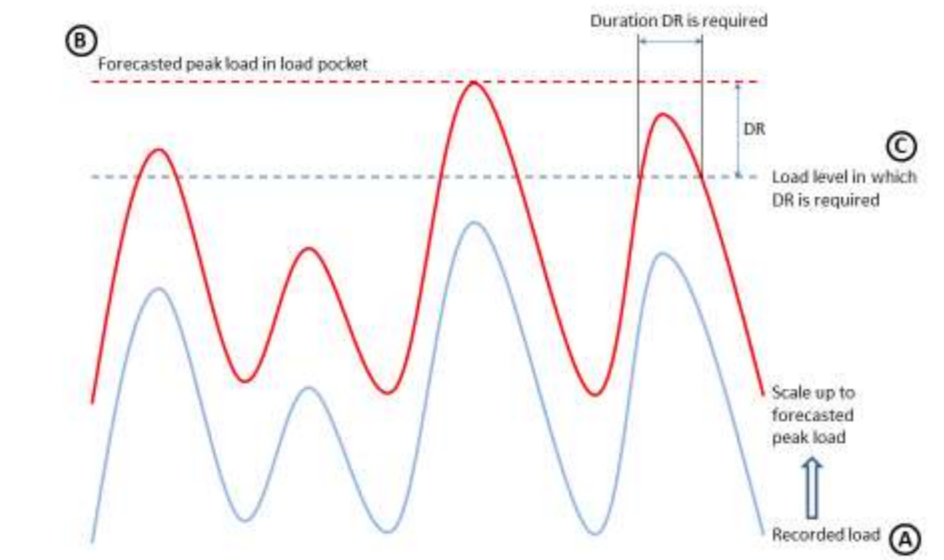
- Published - April 30, 2015
- Objectives - Identify specific CAISO areas that have limited import capability & determine minimum generation (MW) necessary to mitigate local reliability problems

SCE LOCAL AREAS	LOAD POCKET	EFFECTIVENESS FACTORS	2016 LCR (MW)	CONTINGENCY	VIOLATION
LA Basin	Defined	Provided	8,887	Lugo - Victorville 500kV & Sylmar - Gould 230kV (Cat C)	not specified
			7,576	Redondo Unit #7 & Sylmar - Gould 230kV (Cat B)	thermal overload
El Nido			508	La Fresa - Hinson 230kV & La Fresa - Redondo #1 & #2 230kV	voltage collapse
Western LA Basin			4,472	Serrano - Villa Park #2 230kV & Serrano - Lewis 230kV	thermal overload
West of Devers			488	San Bernardino - Etiwanda 230kV & San Bernardino - Vista 230kV	voltage collapse
Valley-Devers			1,722	Palo Verde - Colorado River 500kV & Valley SC - Serrano 500kV	thermal overload
Valley			n/a	Meeting Valley-Devers LCR sufficient to meet this area.	
Eastern LA Basin		Provided	n/a	Meeting West of Devers and Valley-Devers LCR sufficient to meet this area.	
Big Creek/Ventura	Defined	Provided	2,398	Lugo - Victorville 500kV & Sylmar - Pardee #1 or #2 230kV (Cat C)	thermal overload
			2,141	Ormond Beach Unit #2 & Sylmar - Pardee #1 or #2 230kV (Cat B)	thermal overload
Rector		Provided	492	Eastwood & Rector - Vestal 230kV	thermal overload
Vestal		Provided	739	Eastwood & Magunden - Vestal 230kV	thermal overload
S. Clara			247	Pardee - S. Clara 230kV & Moorpark - S. Clara #1 & 2 230kV	voltage collapse
Moorpark			462	Pardee - Moorpark #1 230kV & Pardee - Moorpark #2 & #3 230kV	voltage collapse

Base Assumptions

- Probability of peak load forecast, contingency type (e.g. N-1, N-1-1, N-1-2) and system performance violation fully incorporated into CAISO's analysis
- Local RA showing assumes peak load and contingency will occur and sufficient LCR resources must be available during peak load
- Assume sufficient resources to meet LCR and that DR is last to be used with pre-dispatch DR first type to be utilized
- Scale recorded hourly load shapes of load pocket to forecasted peak load





EXAMPLE
CAISO 2016 LOCAL CAPACITY TECHNICAL ANALYSIS (April 30, 2015)

Rector Sub-area

The most critical contingency for the Rector sub-area is the loss of one of the Rector-Vestal 230 kV lines with the Eastwood unit out of service, which would thermally overload the remaining Rector-Vestal 230 kV line. This limiting contingency establishes a LCR of 492 MW (includes 9 MW of QF generation) in 2016 as the minimum capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

The following table has units that have at least 5% effectiveness to the above-mentioned constraint within Rector sub-area:

Gen Bus	Gen Name	Gen ID	MW Eff Fctr (%)
24370	KAWGEN	1	51
24306	B CRK1-1	1	45
24306	B CRK1-1	2	45
24307	B CRK1-2	3	45
24307	B CRK1-2	4	45
24319	EASTWOOD	1	45
24323	PORTAL	1	45
24308	B CRK2-1	1	45
24308	B CRK2-1	2	45
24309	B CRK2-2	3	45
24309	B CRK2-2	4	45
24310	B CRK2-3	5	45
24310	B CRK2-3	6	45
24315	B CRK 8	81	45
24315	B CRK 8	82	45
24311	B CRK3-1	1	45
24311	B CRK3-1	2	45
24312	B CRK3-2	3	45
24312	B CRK3-2	4	45
24313	B CRK3-3	5	45
24317	MAMOTH1G	1	45
24318	MAMOTH2G	2	45
24314	B CRK 4	41	43
24314	B CRK 4	42	43

Analysis Steps

1. LCR of 492 MW required based on forecasted peak load to guard against a thermal overload triggered by critical contingency.
2. Since SCE builds CAISO's LCR cases, 2016 peak load modeled at Rector is known.
3. Get recorded hourly flows for 2011 - 2015 (most recent five years) through Rector A-Banks and subtract KAWGEN production (local gen).
4. Scale recorded load curve up to modeled load to examine peak periods.
5. Examine DR at 10, 20, 50 & 100 MW levels.

Initial Results

2016 Forecasted Peak 847

	2011	2012	2013	2014	2015
Recorded Peak	678	737	719	719	712
Scaling Factor	1.25	1.15	1.18	1.18	1.19

DR Amount MW / % of Peak		2011				2012				2013				2014				2015			
		Days	Hours			Days	Hours			Days	Hours			Days	Hours			Days	Hours		
			Max	Avg	Total		Max	Avg	Total		Max	Avg	Total		Max	Avg	Total		Max	Avg	Total
10	1.2%	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
20	2.4%	1	1	1	1	3	2	2	5	3	3	2	6	2	3	3	5	2	2	2	3
50	5.9%	3	5	3	9	6	6	5	27	12	7	3	36	13	6	3	44	8	6	4	32
100	11.8%	12	7	4	43	18	8	4	75	31	9	4	133	28	9	5	132	27	8	4	105

PG&E Example - Analysis Steps

1. Get recorded hourly load for 2014 - 2015 in Sierra area.
2. Scale recorded load curve up to modeled load to examine peak periods.
3. Examine DR at 23 (existing), 47, 94 & 188 MW levels.

Initial Results

2016 1-in-10 Peak Forecast (MW)	1171.48	
Recorded Year	2014	2015
Recorded Peak (MW)	1151.34	1183.43
Scaling Factor	1.02	0.99

Resource Deficiency (Needed DR Amount)		2015				2014			
MW/% of Peak		Days	Hours			Days	Hours		
			Max	Avg.	Total		Max	Avg.	Total
22.98	2.0%	1	3	3	3	1	2	2	2
47	4.0%	1	3	3	3	3	3	2	6
94	8.0%	4	5	3	12	4	5	4	14
188	16.0%	15	7	3	52	15	7	4	60

Discussion / Next Steps

- Methodology is LCR area specific: wide area requirements (e.g. LA Basin and Big Creek / Ventura) may be different from sub-areas
  - SCE & PG&E will need to expand the study to other sub-areas
  - Results may or may not be similar across areas
- DR Requirements dependent on DR quantity
  - Counting rules / requirements change as level of DR increases in a given area