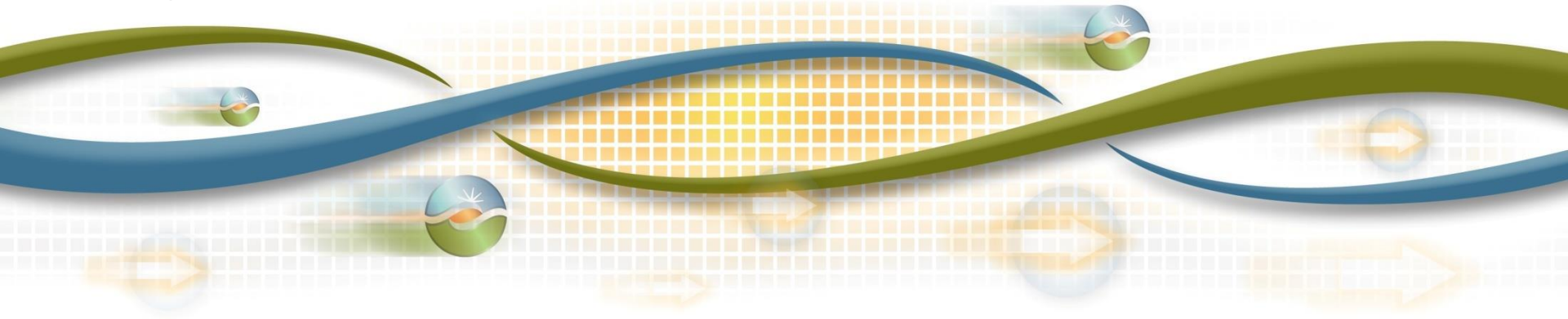


Characteristics of Slow Response Local Capacity Resources

Final Study Plan

Regional Transmission

May 13, 2016



Introduction

- Due to use limitations, local capacity resources such as DR are currently considered post-contingency resources in reliability planning
- As a result, their use is limited to N-1-1 or Category P6 events where they are dispatched after the initial contingency
- The inability to use the resources in the pre-contingency state means they must be capable of responding fast enough when called (within 20 minutes)
- Resources that are not capable of responding within 20 minutes are considered slow-response resources
- The resources must also be capable of sustaining full “out put” for at least four hours

Objective

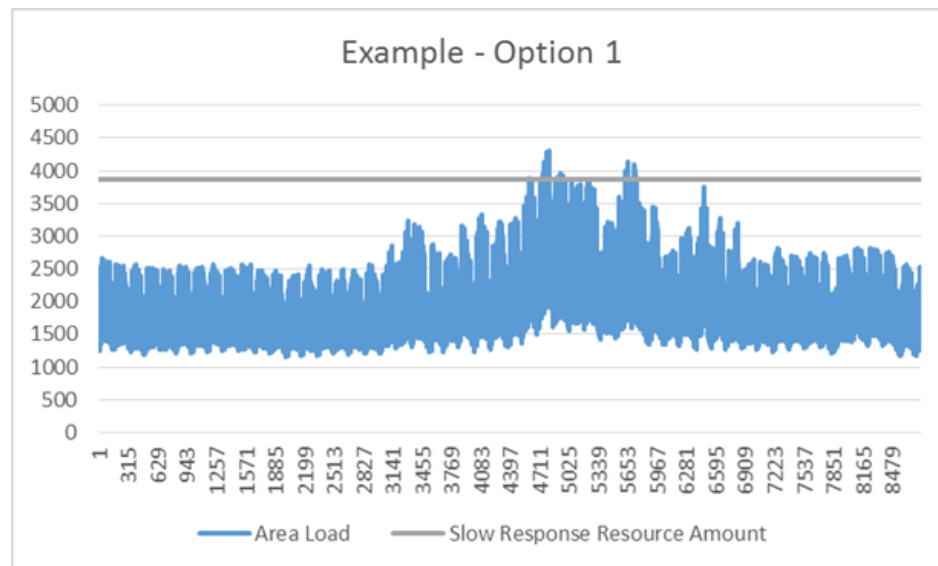
- The objective of this study is to assess the potential frequency and duration of use of slow response resources such as slow response DR if they are called pre-contingency as needed to mitigate local capacity constraints
- The assessment will help in developing the minimum characteristics needed for slow response resources to be eligible for use in reliability planning as a local capacity resource
- Study will assess LCAs and sub-areas in which LSEs expect to use use-limited, slow response resources for local RA in the near or long-term.
- Focus is on slow response DR, while recognizing that there are DR resources that are capable of post-contingency dispatch.

Study Methodology and Assumptions

- Methodology assumes the resources will be dispatched whenever certain loading conditions exist and in anticipation of the first contingency actually occurring.
- In addition to existing slow response DR levels, higher levels of use-limited, slow response resources may be evaluated for each PTO area.
- Annual hourly load forecast data for each LCA and sub area to be assessed will be utilized to quantify potential frequency and duration of use (Method 1)
- The ISO will perform an LCR-type study for selected LCAs/sub areas (Method 2)

Study Steps – Method 1

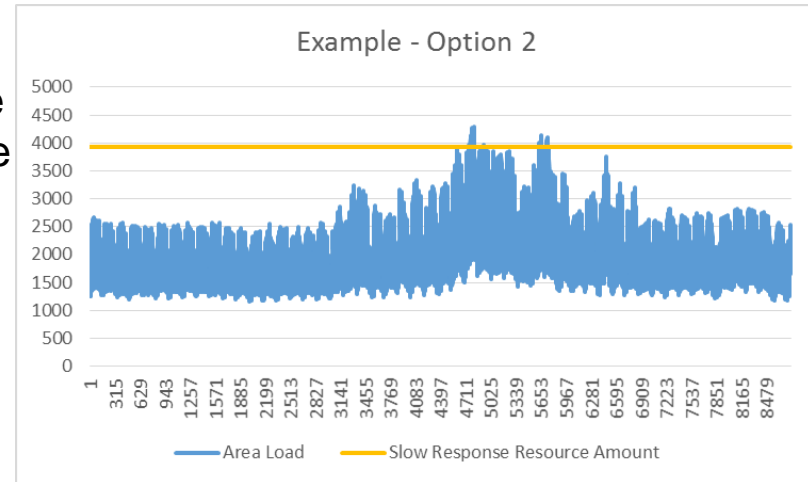
1. Get hourly forecast load data for the LCR area or sub-area under consideration
2. Calculate forecast area peak load minus initial slow response resource amount (existing slow response DR amount)
3. Using a spreadsheet, identify instances where the forecast hourly load for the area exceeds the level obtained in step 2. Record the number of exceedances (days) along with the total and maximum durations (hours) for each month and the year
4. Repeat steps 2-3 for the various use limited, slow response resource amounts to be evaluated
5. Repeat steps 2-4 for each LCA and sub area to be assessed



Slow Response Resource Amount		Pre-dispatch calls needed		
(MW)	(% of Peak Load)	Number of calls (Days)	Total Duration (hours)	Max Duration (hours)

Study Steps – Method 2

1. Get hourly forecast load data for the LCR area or sub-area under consideration
2. Starting from the marginal 2017 LCR base case reduce online generation in the LCR area by the initial amount of slow response resource (existing slow response DR amount)
3. Apply the limiting contingency, which should cause loading, voltage, etc. violation
4. Reduce area load proportionally until the loading, voltage, etc. is acceptable. Record the resulting area load
5. Using a spreadsheet, identify instances where the forecast hourly load exceeds the level obtained in step 4. Record the number of exceedances (days) along with the total and maximum durations (hours) for each month and the year
6. Repeat steps 2-5 for the various use-limited, slow-response resource levels to be evaluated
7. Repeat steps 2-6 for each LCR area and sub area to be assessed



Slow Response Resource Amount		Pre-dispatch calls needed		
(MW)	(% of Peak Load)	Number of calls (Days)	Total Duration (hours)	Max Duration (hours)

Other Considerations

- The methodology does not account for potential use
 - in response to price or triggers other than local capacity related reliability events
 - for system events or by PTOs for distribution system issues
 - due to planned outages and unforeseen events
- Significant upward availability adjustments to the minimum requirements may be needed to account for some of these factors.
- DR contracts typically are limited to one year, so future availability may be impacted as use increases. This is a concern in particular in those areas where slow response DR is used to avoid investment in transmission or more dependable local capacity resources.

Study Plan

- LSEs to perform studies for years 2017 and 2026 using Method 1 for those LCAs and sub-areas in which the LSEs expect to use slow response DR or other use-limited, slow response resource for local RA
- ISO will verify the results in particular for voltage stability limited LCAs and sub-LCAs using Method 2 based on the 2017 LCR study cases.
- LSEs will develop and provide hourly load forecast for each study area that is consistent with the current CEC 1-in-10 peak load forecast as used in the 2016-17 TPP
- LSEs will provide amounts and descriptions of existing slow response DR for each LCA and subarea assessed.
- Results to be presented to stakeholders at the 2016-17 TPP September 21-22 stakeholder meeting

Study Plan – Cont'd

PTO	Areas to be studied	Slow-response resource amounts to be studied
SCE	<ul style="list-style-type: none"> - All LCAs, - All sub-areas 	<ul style="list-style-type: none"> - Existing DR (Slow Response) - 2% of study area load - 5% of study area load - 10% of study area load
PG&E	<ul style="list-style-type: none"> - All LCAs 	<ul style="list-style-type: none"> - Existing DR (Slow Response) - 2% of study area load - 5% of study area load - 10% of study area load
SDG&E	<ul style="list-style-type: none"> - San Diego Sub-area 	<ul style="list-style-type: none"> - Existing DR (Slow Response) - 1% of study area load - 3% of study area load
ISO	Selected areas/sub-areas from those studied by PTO	<ul style="list-style-type: none"> - Existing DR (Slow Response) - Selected amounts from those studied by PTO

Study Contacts

PTO	Contact Info.
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Schedule

Date	Milestone
April 26, 2016	ISO presents draft study plan to stakeholders
April 26 - May 3, 2016	Stakeholder comments to be submitted to regionaltransmission@caiso.com
May 13, 2016	ISO finalizes study plan
May 16 – July 14, 2016	PTOs perform studies
July 15, 2016	PTOs provide results and data to ISO
July 18 – Sept. 15, 2016	ISO reviews PTO results and performs additional studies
Sept. 21-22, 2016	Present results to stakeholders