
June 14, 2010

ADVICE 2484-E
(U 338-E)

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA
ENERGY DIVISION

SUBJECT: Participating Load Pilot Transition into a Proxy Demand
Resource (PDR) Pilot Program

Southern California Edison Company (SCE) hereby submits for filing the following changes to the terms and conditions of its Participating Load Pilot (PLP) Demand Response (DR) program.

PURPOSE

Pursuant to Ordering Paragraph (OP) 5 of California Public Utilities Commission (Commission) Decision (D.) 10-06-002, SCE proposes to transition the previously-approved PLP into a Proxy Demand Resource (PDR) pilot program. The transition will align the existing PLP with the California Independent System Operator's (CAISO's) Market Redesign and Technology Upgrade (MRTU) wholesale electricity market utilizing the new PDR wholesale market product. SCE requests approval of this proposal by July 14, 2010.

BACKGROUND

D.08-12-038 authorized SCE to implement the PLP during years 2009-2011. In 2009, SCE conducted the PLP utilizing 3,255 air conditioner (A/C) cycling devices installed at the National Training Center and Fort Irwin.

On December 30, 2009, SCE submitted its Participating Load Pilot Feasibility Report,¹ which identified areas needing further exploration as required by D.09-08-027 at OP

¹ [http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/8CEDA19110F726598825769B00817D3C/\\$FILE/A.08-06-001+et+al.+2009-11+DR+App+-+SCE+PLP+Feasibility+Report.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/8CEDA19110F726598825769B00817D3C/$FILE/A.08-06-001+et+al.+2009-11+DR+App+-+SCE+PLP+Feasibility+Report.pdf) (last visited Mar. 17, 2010).

24a. SCE intended to explore four areas as described below, including whether small aggregated loads can reliably participate as a PDR in wholesale markets for energy and ancillary services.

On March 18, 2010, SCE filed a Petition for Modification (PFM) of D.09-08-027. In the PFM, SCE described the PLP along with other proposals for PDR participation designed to meet the requirements of OP 25 of D.09-08-027.² SCE described transitioning the A/C cycling PLP to a PDR pilot as a necessary first step in the eventual transition of A/C cycling resources into a PDR compatible demand response resource capable of providing ancillary services. No party opposed SCE's PFM or the proposed PLP pilot.

PDR Pilot – 2010 Proposed Plan

The proposal in this compliance filing is substantially the same as the pilot proposal included in SCE's PFM of D.09-08-027. The transition of the PLP program to a PDR pilot program is scheduled for summer 2010 and is dependent on, among other things, the status of CAISO's tariff modification application with FERC.

Due to delays, there may be little or no time for PDR testing with CAISO in 2010. A PDR market requires FERC approval of the CAISO tariff, which did not occur in April 2010 as anticipated. CAISO recently responded to detailed questions from FERC regarding how PDR will work, and the earliest the FERC can approve the CAISO tariff modifications is July 2010. Approval in July would likely result in the PDR market being available in August. Unfortunately, this late approval would only leave the remaining portion of August and September to conduct PDR testing with CAISO.

If this proposal is approved, SCE will conduct the PDR pilot in 2010 for aggregated A/C demand response. SCE will execute the PDR pilot primarily to further develop the capabilities of Supervisory Control and Data Acquisition (SCADA) system to provide telemetry and settlement data and to refine use of temperature data in developing a load forecast.

If FERC approves the CAISO tariff modifications and CAISO makes the PDR available during the summer of 2010, SCE will take advantage of the period before the end of September to gain experience with the operational aspects and functionality of PDR. If FERC does not approve the CAISO tariff modifications during the summer of 2010, SCE will instead conduct testing to further explore the feasibility of utilizing SCADA system data for forecast and settlement of aggregated DR.

² In OP 25, the Commission directed the Investor Owned Utilities to "propose modifications to one or more existing demand response programs that will make at least 10 percent of the MW enrolled in the authorized DR programs comply with the requirements of CAISO's Proxy Demand Resource." OP 25 also required the IOUs to propose these modifications within 30 days of CAISO filing its tariff modifications with the Federal Energy Regulatory Commission (FERC). CAISO filed its PDR tariff with FERC on Feb. 16, 2010. California Independent System Operator, <http://www.caiso.com/273f/273fcac5d70.pdf> (last visited Mar. 17, 2010).

Whether there is a PDR market or not, SCE requests approval of the PDR pilot by July 14, 2010 to pursue the areas outlined in the December 30, 2009 Feasibility Report as “next steps”, and to modify the pilot to allow participation in PDR in 2010.

The PDR Pilot (PDRP) Implementation Plan is included in Appendix A.

MEASUREMENT AND VERIFICATION FOR AGGREGATED PDR RESOURCES

SCADA system leverages existing near real time load monitoring and communications infrastructure. It is the most efficient method of making small aggregated DR, like A/C cycling resources, available for ancillary services.

As stated in the Feasibility Report for the 2009 PLP: “[w]hile the 2009 PLP successfully addressed a number of outstanding issues concerning the technical and economic viability of small aggregated loads participating in the wholesale markets, some questions remain.” The proposed 2010 PDR pilot would address the four issues outlined in the Feasibility Report:

1. Can small aggregated loads reliably participate as a PDR in wholesale markets for energy and ancillary services?
2. How distinguishable will the A/C load and dispatch be on a more general population substation SCADA system that may have more “noise” from different loads and what is the lowest level of sample telemetry that can be provided before the resource can no longer be reliably counted on for non-spinning reserves?
3. How reliable is an air-conditioning-based resource when developed in a region where summer temperatures are not uniformly hot and dry?
4. How will randomization impact performance and potentially reduce the rebound effect when utilizing a randomization dispatch and restore which is similar to a generation ramp rate?

Assuming a positive outcome from testing, SCE will request that both CAISO and the Western Electricity Coordinating Council adapt their rules for PDR ancillary services to allow substation circuit SCADA system data to provide telemetry and settlement data for aggregated load DR.

BUDGET TO ADMINISTER THE PDR PILOT

In this advice letter, SCE is not requesting additional funding to administer the 2010 phase of the PDR pilot above what was previously authorized. D.08-12-038 authorized bridge funding for SCE’s PLP of approximately \$3.6 million. D.09-08-027 required the \$3.6 million approved in D.08-12-038 to cover the 2009-2011 period.

TIER DESIGNATION

Pursuant to OP 5 of D.10-06-002, this advice letter is submitted with a Tier 2 designation.

EFFECTIVE DATE

SCE requests that this advice letter become effective July 14, 2010, 30 days after submittal, pending Energy Division approval.

NOTICE

Anyone wishing to protest this advice filing may do so by letter via U.S. Mail, facsimile, or electronically, any of which must be received no later than 20 days after the date of this advice filing. Protests should be mailed to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, California 94102
E-mail: ijnj@cpuc.ca.gov and mas@cpuc.ca.gov

Copies should also be mailed to the attention of the Director, Energy Division, Room 4004 (same address above).

In addition, protests and all other correspondence regarding this advice letter should also be sent by letter and transmitted via facsimile or electronically to the attention of:

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Senior Vice President, Regulatory Affairs
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San Francisco, California 94102
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There are no restrictions on who may file a protest, but the protest shall specifically set forth the grounds upon which it is based, and shall be submitted expeditiously.

In accordance with Section 4 of GO 96-B, SCE is serving copies of this advice filing to the interested parties shown on the attached GO 96-B, R.07-01-041, and A.08-06-001 et al. service lists. Address change requests to the GO 96-B service list should be directed by electronic mail to AdviceTariffManager@sce.com or at (626) 302-4039. For changes to all other service lists, please contact the Commission's Process Office at (415) 703-2021 or by electronic mail at Process_Office@cpuc.ca.gov.

Further, in accordance with Public Utilities Code Section 491, notice to the public is hereby given by filing and keeping the advice filing at SCE's corporate headquarters. To view other SCE advice letters filed with the Commission, log on to SCE's web site at <http://www.sce.com/AboutSCE/Regulatory/adviceletters>.

For questions, please contact Amy Liu at (626) 302-4019 or by electronic mail at amy.liu@sce.com.

Southern California Edison Company

Akbar Jazayeri

AJ:al:jm
Enclosure

CALIFORNIA PUBLIC UTILITIES COMMISSION

ADVICE LETTER FILING SUMMARY ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Southern California Edison Company (U 338-E)

Utility type:

ELC GAS
 PLC HEAT WATER

Contact Person: James Yee

Phone #: (626) 302-2509

E-mail: James.Yee@sce.com

E-mail Disposition Notice to: AdviceTariffManager@sce.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas
 PLC = Pipeline HEAT = Heat WATER = Water

(Date Filed/ Received Stamp by CPUC)

Advice Letter (AL) #: 2484-E

Tier Designation: 2

Subject of AL: Participating Load Pilot Transition into a Proxy Demand Resource (PDR) Pilot Program

Keywords (choose from CPUC listing): Compliance

AL filing type: Monthly Quarterly Annual One-Time Other

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #:

D.10-06-002

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: _____

Summarize differences between the AL and the prior withdrawn or rejected AL¹: _____

Confidential treatment requested? Yes No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement.

Name and contact information to request nondisclosure agreement/access to confidential information:

Resolution Required? Yes No

Requested effective date: 7/14/10 No. of tariff sheets: -0-

Estimated system annual revenue effect (%): _____

Estimated system average rate effect (%): _____

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: None

Service affected and changes proposed¹: _____

Pending advice letters that revise the same tariff sheets: _____

¹ Discuss in AL if more space is needed.

Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Ave.,
San Francisco, CA 94102
inj@cpuc.ca.gov and mas@cpuc.ca.gov

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Detailed Implementation Plan
Revised for Advice Letter 2484-E
June 14, 2010

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1. EXECUTIVE SUMMARY

In 2008, the CAISO requested that SCE provide wholesale market-based Participating Load (PL) when Market Redesign and Technology Upgrade (MRTU) Release 1 is deployed by CAISO in 2010. In response, SCE proposed to modify its residential customer-based 2006-2008 Demand Response (DR) Spinning Reserve Pilot (DRSRP) as a PL pilot program to evaluate the capability for retail load to act as a wholesale PL Ancillary Service (AS). The objectives of the resulting 2009 SCE Participating Load Pilot (PLP) included facilitating the articulation of CAISO telemetry requirements and technical specifications for small retail aggregated load DR to act as wholesale PL AS, and to uncover and resolve policy, process, and system issues associated with using retail customers as resources in the wholesale market.

SCE conducted its 2009 PLP pilot in collaboration with the Army National Training Center at Fort Irwin (Fort Irwin) near Barstow, CA. Using aggregated air conditioner direct load control as the DR resource, SCE's PLP team including Fort Irwin and suppliers were able to:

- Develop processes, procedures and systems both internal to SCE and external interfacing with CAISO to ready the aggregated resource for bidding into CAISO wholesale markets as PL, dispatching the resource as a non-spinning reserve ancillary service and settlement of the resource after a PLP event.
- Develop methodologies and algorithms for estimating the amount of DR load available prior to dispatch by utilizing proxy telemetry installed at a statistical sampling of the end loads and reconciling the estimated load drop with the performance observed at both an aggregation point interval meter as well as the appropriate circuit or feeder Supervisory Control and Data Acquisition (SCADA) meter.
- Propose methodologies and algorithms for estimating the DR load impacts for small aggregated load DR in the MRTU market for settlement purposes utilizing interval metering at an aggregation point instead of at individual end loads.
- Determine whether the developed methodologies for proxy telemetry and settlement were sufficient for CAISO monitoring and settlement purposes under MRTU.

While SCE was executing the 2009 PLP pilot, SCE was also participating in CAISO workshops to collaboratively develop a new wholesale market product for DR called Proxy Demand Resource (PDR). PDR was constructed to:

- Enable customer-based DR as a viable resource that can compete in the wholesale market under MRTU in a manner comparable to supply (generation).
- Enable DR to bid, dispatch and settle as independent element under MRTU.
- Attract customer DR resources to high MRTU price areas in CAISO's Locational Marginal Pricing wholesale electric market.
- Enable retail DR resource integration into MRTU by defining DR characteristics establishing operating parameters, acknowledgement of the limited nature of DR resources and enabling a price trigger threshold.

SCE has determined based on the workshops discussions that the CAISO PDR market product is potentially more suitable for accepting small aggregated air conditioning load than the Participating Load product. The PDR market product did not exist when SCE originally proposed the PLP in September 2008, so SCE now proposes to repurpose its pilot program efforts and examine PDR applicability for the 2010 and 2011 phases for the previously authorized PLP. This new pilot proposed by SCE will be called the Proxy Demand Resource Pilot (PDRP).

SCE will use existing SCE distribution circuit level SCADA data as both a source of AS telemetry and the source of metering for PDR settlement. The goal of this pilot is to determine whether the existing SCE SCADA data can provide either a proxy for CAISO measurement and verification requirements or a basis to propose changes to current CAISO and WECC requirements.



SCE 2010 Proxy Demand Resource Pilot

In addition, SCE will utilize day-ahead outdoor temperature forecasts as well as the tonnage of air conditioners participating in the tests to estimate the amount of air conditioning load that will be available the next day. This will be the amount of PDR that would be bid into the CAISO day-ahead AS market for non-spinning reserve.

2. PROJECT OBJECTIVES & PERFORMANCE MEASUREMENTS

2.1 Project Objectives

2.1.1 Proxy Demand Resource

An objective of SCE's PLP was to explore the technical and economic feasibility of small SCE-aggregated Demand Response (DR) resources as a potential participant in the MRTU Markets and Performance (MAP) markets for PL, including Dispatchable Demand Resource (DDR) and Proxy Demand Resource (PDR) products.¹ The DDR wholesale market product was not pursued by the CAISO stakeholder group and the DDR product no longer exists. The PDR wholesale market proposal² has now been finalized pending Federal Energy Regulatory Commission (FERC) approval of the related tariff modifications.³

The PDR market product is better suited for small aggregated load than Participating load. The primary operational difference between PDR and PL is that PL requires the retail load schedule to be forecast as part of the bid to provide demand response while PDR only requires the demand response aspect to be bid by the Demand Response Provider (DRP) independent of the load forecast submitted by the Load Serving Entity (LSE). Separating the load forecast from the demand response bid enables direct participation by a DRP who may be a separate entity from the LSE and therefore would not be able to schedule the load which complies with FERC order 719.⁴ Separation of the load forecast from the demand response bid also relieves the difficulty of providing a 24/7 load forecast for a DR resource, which was one of the operational hurdles for demand response to participate in the wholesale market through PL. Because the PDR market product did not exist when SCE originally proposed the PLP in September 2008,⁵ SCE is proposing to utilize PDR for the 2010 phase of the MRTU compliance pilot. Therefore, to differentiate from the 2009 PLP, the 2010 pilot will be referred to as the Proxy Demand Resource Pilot (PDRP).

In SCE's 2009 PLP Implementation Plan, SCE noted that it was possible that it would recommend ending the PLP if it is apparent that small aggregated DR is not feasible for MRTU PL markets. While the 2009 PLP was successful in forecasting and settling the DR portion of the PL, both CAISO and SCE's Energy Supply and Management did not consider it of value to forecast the underlying air conditioning customer usage portion of the PL. SCE was able to develop a DR load forecast for the PLP resource at Fort Irwin, but the PL customer usage was scheduled as a constant or static value despite the variable nature of the AC load. Therefore, SCE recommends ending the PL portion of the pilot in favor of a PDR phase of the pilot which will focus on developing economic yet accurate alternatives for developing PDR load forecasts

¹ See SCE 2009 Participating Load Pilot Implementation Plan was provided to CPUC Energy Division on March 11, 2009.

² Draft Final Proposal for the Design of PDR, Revised on August 28, 2009. Approved by CAISO board on September 11, 2009. <http://www.caiso.com/241d/241da56c5950.pdf>

³ Proxy Demand Resource (PDR) Tariff Modifications <http://www.caiso.com/248e/248ec06314bd0.html>

⁴ See FERC Order 719-A (128 FERC P 61059) (issued Jul 16, 2009) at Paragraph 51.

⁵ Amended Application Of Southern California Edison Company (U338-E) For Approval Of Demand Response Programs, Goals And Budgets For 2009-2011, Volume II [http://www3.sce.com/sscc/law/dis/dbattach1e.nsf/0/6DB191B5F3248A4F882574C90070C1AB/\\$FILE/A.08-06-001+2009-11+DR+Amended+App_SCE-02+MRTU+Testimony+Vol.+II.pdf](http://www3.sce.com/sscc/law/dis/dbattach1e.nsf/0/6DB191B5F3248A4F882574C90070C1AB/$FILE/A.08-06-001+2009-11+DR+Amended+App_SCE-02+MRTU+Testimony+Vol.+II.pdf)

for bidding, telemetry for ancillary services and data sources for settlement while developing operational knowledge of the PDR wholesale market product.

2.1.2 Ancillary Services Telemetry

In 2009, SCE conducted the PLP utilizing 3,255 residential and small non-residential radio-controlled air conditioner (AC) cycling devices installed at Fort Irwin. Over the course of 20 weeks, SCE conducted 32 PL events. In twelve events coordinated with CAISO, SCE bid the PLP resource as PL into the CAISO's day-ahead wholesale market for non-spinning reserve AS. SCE developed algorithms to estimate the aggregated load drop after event dispatch based on available SCADA data and interval meter data with additional verification provided utilizing a sample telemetry approach providing proxy telemetry information. The results from this pilot are detailed in the 2009 SCE Participating Load Pilot Feasibility Report.⁶

In the 2009 PLP Implementation Plan submitted to the CPUC Energy Division in March 2009, SCE stated that "SCE and CAISO expect that many lessons will be learned throughout the PLP and that the results of the PLP will help inform whether small aggregated DR load is technically and economically capable of participating in the MRTU MAP PL market for DDR and PDR products. In addition, the PLP may result in recommended changes to CAISO PL requirements or technical specifications to make small aggregated DR load feasible in MRTU MAP."

SCE identified a technical barrier related to the CAISO telemetry requirement for providing AS. "It will be particularly challenging to determine how (and if) SCE's PLP will implement the CAISO's telemetry requirement for PL" {specifically AS}. The results from SCE's 2009 PLP were encouraging. The 17% sample SCE proxy telemetry solution installed on 555 of the 3,255 air conditioners was correlated with 94% of the load drop quantified by SCADA data. However, the outdoor air temperature forecast was also a good predictor and was correlated with 88% of the load drop quantified by SCADA data. PG&E's Smart AC testing yielded similar encouraging results.

SCE and CAISO agree that the rapid response and reliable assurance of AC cycling load impacts is well suited to AS. The AC cycling resource is quick in response (via the radio dispatch) and is also readily available on hot days when the wholesale market needs are most expected. The AS market would benefit from this fast-acting demand side resource also to "back up" intermittent renewables if used as a contingent resource on short notice.

While the sample telemetry approach to meet AS requirements for AC cycling indicated technical potential and feasibility, it still may not be cost effective. For example, SCE's current Summer Discount Plan (SDP) has approximately 350,000 customers and 450,000 cycling devices participating in the program. Deploying a 10% sample telemetry system would involve 45,000 installations to the existing customer base if these resources were to provide AS through PDR. However, exploring the possibility of utilizing existing SCADA data at the substation circuit level to meet the AS telemetry requirement and refining the temperature forecast to develop the load drop forecast for bidding holds the promise to act as a CAISO telemetry proxy, and drastically improve the economic feasibility of small aggregated load demand response to provide AS. Therefore, during the summer of 2010, SCE would like to use its SCADA system as the telemetry and settlement source for AC cycling AS and develop temperature as a variable for forecasting the AC load to be bid as PDR.

⁶ The SCE 2009 Participating Load Pilot Feasibility Report is available at:
[http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/8CEDA19110F726598825769B00817D3C/\\$FILE/A.08-06-001+et+al.+2009-11+DR+App+-+SCE+PLP+Feasibility+Report.pdf](http://www3.sce.com/sscc/law/dis/dbattach3e.nsf/0/8CEDA19110F726598825769B00817D3C/$FILE/A.08-06-001+et+al.+2009-11+DR+App+-+SCE+PLP+Feasibility+Report.pdf)

2.1.3 2010 PDRP Goals

For 2010, SCE's proposed pilot will focus on the operational aspects and functionality of PDR while developing the capability of SCADA to provide equitable telemetry and settlement data and also refine the ability for temperature to establish a load forecast. SCE requests to modify its Participating Load Pilot into a Proxy Demand Resource Pilot for 2010. Assuming a positive outcome from testing, the desired measure of success will be to develop the basis for requesting that CAISO and Western Electricity Coordinating Council (WECC) adapt their rules for PDR ancillary services to allow aggregated metering points, such as substation circuit SCADA data, to provide telemetry and settlement data for aggregated load demand response.

SCE and other market participants have worked with CAISO on PDR market simulation during the normal course of business for wholesale operations. These efforts were focused on incorporating PDR into the standard CAISO systems and interfaces. The CAISO MRTU market utilizes many automated systems to enable bidding, scheduling, dispatching and settlement of standard generation resources. These same systems enable these functions for PL and were utilized for these same functions during the 2009 PLP and will be also utilized for the basic bidding, dispatch and settlement of PDR resources. Resource telemetry for Ancillary Services is delivered through an Energy Communications Network (ECN) into the CAISO's Data Processing Gateway (DPG). PDR resources will be bid into Scheduling Infrastructure Business Rules (SIBR), scheduled through CAISO Market Results Interface (CMRI) system, dispatched through the Automated Dispatch System (ADS) system and settled through the Operational Meter Analysis and Reporting (OMAR) system. In addition, CAISO is developing new systems to register PDR locations, calculate PDR baselines and calculate PDR performance. The market simulation activities performed by SCE this spring were not a part of the PLP or proposed PDR pilot, but were performed in the normal course of business for wholesale market interaction.

If FERC approves the CAISO tariff modifications to incorporate PDR and CAISO makes the PDR market product available prior to the end of September, SCE will take advantage of the time available to register PDR resources and execute tests including the bidding, dispatch and settlement for the registered PDR resources. Regulatory approval from FERC and operational readiness from CAISO will determine how much CAISO integrated testing will be possible and SCE looks forward to gaining any experience with the operational aspects of executing PDR events.

SCE's intent with the PDRP is to begin testing of SCE-aggregated AC load in its service territory in July 2010. Testing performed before the PDR product is available will focus on refining SCADA system data as a telemetry and settlement source for AC cycling AS and will develop temperature as a variable for forecasting the AC load to be bid as PDR. A July date is highly dependent on a rapid approval of this proposal from the CPUC.

SCE and CAISO expect that many lessons will be learned throughout the PDRP and that the results of the PDRP will inform how small aggregated DR load can participate in the MRTU market for PDR AS. The PDRP may result in recommended changes to CAISO PDR business requirements⁷ or technical specifications⁸ to make small aggregated DR load feasible in MRTU.

SCE is encouraged by PG&E's results from a similar AS pilot⁹ and intends to incorporate the learnings into this new PDRP pilot. Even though the pilots are similar, SCE needs a separate and distinct pilot to establish business processes and system integration requirements for a potential implementation and to confirm the SCADA capability, which differs amongst utilities.

⁷ Proxy Demand Resource (PDR) Implementation Initiative <http://www.caiso.com/23a6/23a6e37f1f20.html>

⁸ Demand Response - Proxy Demand Resource (PDR) Policy
<http://www.caiso.com/23bc/23bc873456980.html>

⁹ 2009 Pacific Gas and Electric Company SmartAC Ancillary Services Pilot, Freeman, Sullivan & Co., 12/31/09

The following detailed implementation plan will outline the pilot plan for 2010. SCE will assess next steps for the 2011 phase of the pilot based on results from the 2010 PDRP and propose the best way to proceed.

2.2 Project Deliverables

- Launching the PDRP for use by Summer 2010.
- Development (and evaluation) of algorithms for monitoring sub station circuit SCADA data, as well as temperature and weather forecast data to forecast available load
- Further development (and evaluation) of the 2010 algorithms to estimate actual load drop after event dispatch based on available sub station circuit SCADA data.
- Recommendations on how small aggregated DR load can technically and economically participate in the MRTU market utilizing the PDR product.
- Recommend changes to CAISO PDR requirements or technical specifications to make small aggregated DR load feasible in MRTU.
- Timing and activities highly dependent on CPUC approval of Petition to Modify to allow repurposing of the Participating Load Pilot (PLP) to a Proxy Demand Resource Pilot (PDRP).

2.3 Project Milestones

The following schedule assumes approval of this plan by June 3, 2010.

Milestone	Expected Date
Begin testing to collect SCADA data to quantify load drops and verify load drop forecasts	July 2010
Registration of PDR locations with CAISO	August 2010 ¹⁰
Begin end-to-end Acceptance Testing with CAISO	August 2010 ¹⁰
Begin bidding PDRP as non-spinning reserve into CAISO Day Ahead Market	September 2010 ¹⁰
Stop bidding PDRP as non-spinning reserve into CAISO Day Ahead Market	September 2010 ¹⁰
Finalize SCE PDRP Feasibility Report	December 17, 2010
Final MRTU Settlement for expected final PDR event of 2010	February 24, 2011

¹⁰ Assuming FERC approval of the CAISO tariff modifications and PDR market product availability by CAISO

3. PLAN SCOPE, ASSUMPTIONS, DEPENDENCIES AND CONSTRAINTS

3.1 Testing Scope

SCE was encouraged by the findings from the 2009 PLP and the quality of data provided by its substation level SCADA systems for quantifying demand response impacts. SCE found a positive correlation between temperature factors and sample telemetry data in forecasting load. Per the SCE PLP Feasibility Report, sample telemetry data was positively correlated to 94 percent of the impacts found in the SCADA data across curtailment events while temperature explained 88 percent of the variation in the SCADA data. A follow up report is currently under development in collaboration with Lawrence Berkeley National Laboratory which will detail both the customer survey results and performance of the proxy telemetry sensors.

For the 2010 PDRP, SCE would like to explore the potential for substation circuit SCADA to act as a proxy for settlement quality meter data for PDR. SCE would also like to examine the potential for temperature to serve as a proxy for individual customer load telemetry. SCE's Summer Discount Plan (SDP) has an Enhanced option for customers allowing both unlimited interruptions during the summer season as well as up to two tests per cycling season with a maximum test duration of 30 minutes each. Utilizing SDP customers enrolled in the enhanced option, the PDRP will use one or both of the allowed test events on ten to twelve substations with SCADA monitoring for a total of 20 to 24 pilot tests during 2010.

SCE's PDRP may deviate from current CAISO requirements for AS and/or PDR, but the intent of the PDRP is to explore measurement and verification criteria for small SCE-aggregated DR load and to determine whether the proxies developed for telemetry and metering are acceptable to CAISO. Specific deviations for the PDRP may be agreed upon and documented by SCE and CAISO, as it was in 2009 of the pilot in the Participating Load Pilot Agreement between SCE and CAISO.

3.1.1 CAISO Interface

For the 2009 PLP, SCE and CAISO utilized the standard market processes and systems for telemetry (monitoring), scheduling, dispatch and settlement of the SCE Participating Load Pilot events. Resource telemetry is delivered through an Energy Communications Network (ECN) into the CAISO's Data Processing Gateway (DPG). Resources are bid into Scheduling Infrastructure Business Rules (SIBR), scheduled through California ISO Market Results Interface (CMRI) system, dispatched through the Automated Dispatch System (ADS) system and settled through the Operational Meter Analysis and Reporting (OMAR) system. The manual dispatch step required for the 2009 pilot was a phone call when SCE received the CAISO dispatch instruction to the SCE pilot coordinator and subsequently to the grid control center who then dispatched the pilot resource. SCE will explore how the dispatch step can achieve some level of automation for the 2010 PDRP. CAISO is developing new systems to register PDR locations, calculate PDR baselines and calculate PDR performance which SCE hopes to utilize during the operational phase of the PDRP.

3.1.2 Telemetry

SCE and CAISO acknowledge that it will not be cost-effective (in the foreseeable future) to provision 100 percent of small aggregated loads individually with real-time telemetry for purposes of satisfying CAISO's Ancillary Service requirements currently in place for MRTU. However, both SCE and CAISO seek to ensure that the estimate of load available for curtailment, as well as the sampling of measurement of load

reductions after dispatch, is sufficiently accurate and timely to support the CAISO markets and grid reliability.

SCE can determine how many SDP customers receive their power from each district and substation because the SDP switches are associated with districts and substations. Each customer enrolled in the program has registered the tonnage of their air conditioner thereby providing a source for calculating the total load for that air conditioner. A day-ahead temperature forecast can help determine how many air conditioners will be on during a specific period of time. These three factors can be the basis for providing a load estimate for bidding PDR into the day ahead ancillary services market.

3.1.3 Bidding

Assuming FERC approval of the CAISO tariff modifications and PDR market product availability by CAISO, SCE will place Proxy Demand Resource bids for Non-Spinning Reserve Ancillary Service into CAISO's Day-Ahead Market. SCE will determine whether to bid the PDRP resource into the MRTU Day-Ahead market based on availability of the resource as determined by constraints including the probability of a simultaneous SDP event. The amount of PDR bid into the MRTU Day-Ahead market will also vary based on the expected load of the aggregated PDRP resource taking into account factors including weather forecast and expected resource performance. The price of the PDRP bid will need to be determined based on the market price of comparable AS resources (SCE does not expect significant pilot cost recovery to be gained through PDRP event settlement with CAISO). Because of the nature of A/C load, the amount of load will vary from day to day, based on many factors, including temperature and customer usage.

3.1.4 Dispatch

The most significant integration challenge SCE faced in conducting the 2009 PLP was related to the FERC Standards of Conduct for internal communications between the Transmission & Distribution Business Unit (TDBU) and Power Procurement Business Unit (PPBU). As a result, during the PLP SCE developed the business processes for how standard PPBU interactions with the CAISO wholesale market could be communicated to the PLP team who would then contact TDBU to initiate the air conditioning resource dispatch and restoration at Fort Irwin. The business processes were reviewed and approved by the SCE Affiliate Compliance Office prior to starting the execution phase of the PLP. In 2010, PDRP dispatch will likely remain a manual process to comply with FERC rules, as well as to mitigate the expense of automating a pilot program. Therefore, there is no automated link between PPBU systems which receive CAISO's ADS dispatch commands and the Grid Control Center (GCC) which controls the SDP dispatch. After assessing the results of the 2009 PLP, there is significant assurance that the SDP triggered DR can perform to the timing requirements of a 10 minute response for non-spinning reserve ancillary service. However, SCE will explore whether the ADS commands for the PDR specific resources can trigger an email or other automated notification to the PDRP team in order to dispatch the PDRP resource.

3.1.5 Metering & Settlement

As with the 2009 PLP, the intent in the PDRP is to develop a proxy for the CAISO and WECC telemetry requirements for AS. SCE intends for the PDRP to use the sub station circuit SCADA data for DR Settlement, which includes high-resolution metering capability and continuous monitoring.

SCE's Edison SmartConnect[™] advanced metering infrastructure, which will provide hourly interval usage data for residential customers, will not be available for the PDRP. However, after Edison SmartConnect[™] deployment to residential customers, SCE and CAISO will need to determine how the one hour interval data is compatible with wholesale market settlement requirements for different wholesale markets and products.

3.1.6 Information and Technology

SCE and CAISO will attempt to integrate the PDRP processes into the systems supporting MRTU, to the extent possible. However, business process and systems development to support all aspects of PDR bidding, telemetry, dispatch, metering and settlement will take time to implement and will require some manual work around solutions in the near term. Through this pilot SCE expects to identify the required business processes and system development/integration work that would be needed for a potential full implementation.

3.1.7 Funding and Authorization

SCE's Participating Load Pilot (PLP) was approved as a three-year pilot for the 2009-2011 program cycle funded in D.08-12-038 and D.09-08-027. As mentioned during the CPUC PDR workshop conducted from December 16-18, 2009, SCE can modify its existing PLP to a 2010 PDR Pilot to enable some PDR participation in 2010 (assuming FERC approval of the CAISO tariff modifications and PDR market product availability by CAISO). This Implementation Plan and accompanying Advice Letter outlines SCE's plans for this transition and seeks CPUC approval to do so. When SCE originally proposed the PLP in September 2008, the PDR product was in the early draft stage, and PL was the focus of DR participation in MRTU. Having completed the initial year of the PLP and having finalized the CAISO PDR market product (subject to FERC approval), SCE believes the PDR product is better suited to small and medium aggregated DR resources. Modifying SCE's PLP to become a PDRP would provide an opportunity for SCE to work with CAISO on operation of the new PDR wholesale market product in 2010 (pending FERC approval). Success of the proposed 2010 PDRP is highly dependent on timely approval from the CPUC to conduct the pilot as described in this implementation plan.

3.1.8 Constraints

SCE will administer the PDRP using the testing provision of the Summer Discount Plan tariff, which allows SCE to conduct up to two tests per cycling season for a maximum of 30 minutes each. SDP availability is between June 1 and October 1. Utilizing SDP customers enrolled in the enhanced option as well as the two 30 minute tests allowed for the program, SCE proposes to conduct up to two test events on up to twelve individual and separate substations for up to 24 pilot tests during the summer of 2010.

3.2 Testing Assumptions And Dependencies

- FERC approval of CAISO tariff modifications to incorporate PDR and CAISO makes the PDR market product available prior to the end of September will allow SCE will take advantage of the time available to potentially register PDR resources and execute tests including the bidding, dispatch and settlement for the registered PDR resources. Regulatory approval from FERC and operational readiness from CAISO will determine how much CAISO integrated testing will be possible and SCE looks forward to gaining any experience with the operational aspects of executing PDR events.
- The March 17, 2009 PLP Agreement between SCE and CAISO can govern the 2010 PDRP.

4. RISK FACTORS AND MITIGATION STRATEGY

Risk	Mitigation
<p>FERC does not approve the CAISO's PDR tariff modifications which were filed with FERC on February 16, 2010 and implement the processes and systems to support PDR during the summer of 2010.</p>	<p>If PDR is not enabled during the summer of 2010, SCE will still gain knowledge to develop aggregated air conditioning for wholesale market participation by exploration of weather and outdoor temperature for forecasting DR load and utilization of SCE distribution circuit level SCADA data as both a source of AS telemetry and PDR settlement.</p>
<p>FERC Standards of Conduct limit communication from Energy Procurement and Grid Control impacting ability to dispatch PL events.</p>	<p>Early review of PDRP business processes and data flow diagrams with FERC Standard of Conduct monitors.</p>

5. TEST PROJECT PLAN FOR PHASE I

5.1 PDRP Plan Timeline

Milestone	Expected Date
Identification of PDRP substation locations	3/5/10 - Complete
Further develop 2009 PLP algorithms to forecast available load for DR based on substation circuit SCADA data and temperature data	Upon CPUC Approval
Begin testing to collect SCADA data to quantify load drops and verify load drop forecasts	July 2010
Initiate further development of algorithms for settlement based on SCADA data	July 2010
Registration of PDR locations with CAISO	August 2010 ¹⁰
Begin end-to-end Acceptance Testing with CAISO	August 2010 ¹⁰
Begin bidding PDRP as non-spinning reserve into CAISO Day Ahead Market	September 2010 ¹⁰
Stop bidding PDRP as non-spinning reserve into CAISO Day Ahead Market	September 2010 ¹⁰
Complete development of algorithms to forecast available load for DR	November 1, 2010
Complete development of algorithms for settlement based on SCADA data	November 1, 2010
Finalize SCE PDRP Feasibility Report	December 17, 2010
Final MRTU Settlement for expected final PDR event of 2010	February 24, 2011

5.2 PDRP Budget

PDR Pilot	Labor	Non-Labor				Sub Total ¹¹
		Incentive	Devices & Installation	Sys. & Tech.	Other	
Q1 2010	\$ 40,000	\$0	\$0	\$ 100,000	\$ 50,000	\$190,000.00
Q2 2010	\$ 50,000	\$20,000	\$0	\$ 100,000	\$ 60,000	\$230,000.00
Q3 2010	\$ 75,000	\$20,000	\$0	\$ 100,000	\$ 100,000	\$295,000.00
Q4 2010	\$ 75,000	\$0	\$0	\$ 100,000	\$ 75,000	\$250,000.00
2010 Total	\$240,000.00	\$40,000.00	\$0.00	\$400,000.00	\$285,000.00	\$965,000.00

Labor: Direct SCE labor for the PDRP

Incentive: Payments to customers for participation in the PDRP

¹¹ There is up to a one month delay between completion of the month and when financial results for that month are available. Therefore, some expenditures from 2009 are reflected in 2010 accruals.

SCE 2010 Proxy Demand Resource Pilot

Devices & Installation: Cost for procurement and installation of Proxy Telemetry and Metering equipment (hardware) necessary to conduct the PDRP

Systems & Technology: Cost associated with the development of the proxy telemetry algorithms and settlement algorithms. This includes:

- Costs associated with safety and accuracy testing as well as telecommunications testing of candidate proxy telemetry devices
- The cost for contracting 3rd parties to develop the algorithms
- The cost for establishing and hosting a 3rd party hosted web based database and system for communicating proxy telemetry information
- The cost for establishing and hosting a 3rd party system for collecting and analyzing proxy telemetry information

Other: Non labor expenses associated with the PDRP, including:

- Engaging with the CAISO and other utilities and stakeholders for development of MRTU PL markets and products
- Consulting labor and fees associated with regulatory engagement and CAISO collaboration for purposes of the PDRP and MRTU Participating Load market and product development
- Preparation, development and execution of the PDRP
- Contingency reserve to be utilized as needed for Incentive, Devices, Installation, Systems or Technology

6. GLOSSARY

Term or Acronym	Definition
A/C	Air Conditioner
ADS	Automated Dispatch System
AS	Ancillary Services
CAISO	California Independent System Operator
CERTS	Consortium for Electric Reliability Technology Solutions
CMRI	California ISO Market Results Interface
CT	Current Transformer
DDR	Dispatchable Demand Resource
DLC	Direct Load Control
DPG	Data Processing Gateway
DR	Demand Response
DRP	Demand Response Provider
DRSRP	Demand Response Spinning Reserve Pilot
ECN	Energy Communications Network
ESP	Electric Service Provider
FERC	Federal Energy Regulatory Commission
Fort Irwin	Army National Training Center at Fort Irwin
GCC	Grid Control Center
LSE	Load Serving Entity
MAP	Markets and Performance (formerly MRTU Release 1A)
MRTU	Market Redesign and Technology Upgrade
OMAR	Operational Meter Analysis and Reporting
PDR	Proxy Demand Resource
PDRP	Proxy Demand Resource Pilot
PL	Participating Load
PLP	Participating Load Pilot
SCADA	Supervisory Control And Data Acquisition
SCE	Southern California Edison
SDP	Summer Discount Plan
SIBR	Scheduling Infrastructure Business Rules
TDBU	Transmission & Distribution Business Unit
WECC	Western Electricity Coordinating Council

WG2	Working Group 2
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