Demand Response Frequently Asked Questions

(Last Updated 02/23/16)

#	Questions	Answers
1	Under the current CAISO tariff, assuming it would otherwise meet the requirements under the CAISO tariff and business practice manuals to do so, can the Load associated with a retail meter participate in the CAISO Markets as a part of a Proxy Demand Response Resource or a Reliability Demand Response Resource, even if there is an energy storage device located behind the retail meter?	Yes, but PDR and RDRR only allow for load curtailment, not load consumption or the export of energy to the grid.
2	Under the current CAISO tariff, can the aggregate Load of the retail meters constituting a Proxy Demand Resource or a Reliability Demand Response Resource, used to calculate the Demand Response Energy Measurement for that resource for a Demand Response Event, be negative?	No. The PDR/RDRR model is only a load curtailment model, it does not promote or enable load consumption. Nor does it promote or enable export of generation (storage discharge in excess of load behind meter) at any level of the aggregation. Note: a negative DR energy measurement represents to the ISO that the PDR/RDRR resource consumed more load during the event (ISO dispatch). A calculated DR energy measurement < 0 will always be set to zero for settlement of PDR/RDRR.
3	Under the current CAISO tariff, can the Load of a retail meter that is a component of a Proxy Demand Resource or a Reliability Demand Response Resource, and that is used to calculate the Demand Response Energy Measurement for that resource for a Demand Response Event, be negative?	No. The PDR/RDRR model is only a load curtailment model, it does not promote or enable load consumption at any level. Nor does it promote or enable export of generation (storage discharge in excess of load behind meter) at any level of the aggregation.
4	Under the current CAISO tariff, is there any way for a storage device located behind a retail meter to participate in the CAISO Markets, other than indirectly as a part of the Load incorporated into a Proxy Demand Resource or a Reliability Demand Response Resource?	Yes. A storage device could participate using the ISO's non-generating resource (NGR) participation model. Under NGR, a participating generator agreement (PGA) and participating load agreement (PLA) are required. Additionally, NGRs are ISO metered entities requiring them to comply with ISOME requirements. All utility interconnection requirements would need to be met which may include the need to obtain a WDAT interconnection, similar to any other generator connected at the distribution level that participates in the wholesale market.

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5	Under the current CAISO tariff, can a Generating Unit with a rated capacity of less than 500 kW participate in the CAISO Markets?	Yes, if it is part of an aggregation over 500 kW.
6	Under the current CAISO tariff, can a storage facility with a rated capacity of less the 500 kW, whose electrical output is capable of being separately identified and metered that is connected to the CAISO Controlled Grid, either directly or via interconnected transmission, or distribution facilities or via a Pseudo-Tie, participate in the CAISO Markets?	Yes, if it is part of an aggregation over 500 kW.
7	Is telemetry required for RDRR?	No, per section 2.1 of the Direct Telemetry BPM.
8	When is telemetry required?	Telemetry is required when the resource aggregations are 10 MWs and above and are providing ancillary services.
9	DRP wants to participate in the real-time energy market. However, the current confirmed registrations is associated with a resource that has the "DA Only" box checked on the "Performance" tab in DRS. Will the DRP need to withdraw the current registration in question?	Yes. The DRP will need to submit a new registration showing that the "DA Only" box is no longer checked.
10	Can a single RIG represent multiple resources?	Yes
11	What kind of data is submitted by the Scheduling Coordinator as SQMD?	Historical meter data for the baseline. SCs also submit event meter data. See BPM for metering section 12 for additional PDR and RDRR meter data submittal and formatting requirements
12	What kind of calculation is performed in the Demand Response System?	Baseline and performance measurement calculations are performed in DRS.
13	Who is responsible for calculating the 10 in 10 non-event day baseline?	The 10 in 10 non-event methodology is performed by the ISO using SC submitted settlement quality meter data.
14	Can alternative baseline calculations be used?	Yes. Alternative baseline calculation can be used with ISO approval. However, it must conform to NAESB standards and may require tariff amendment.

15	Does CAISO currently track or measure what source the load reduction comes from (HVAC/Storage/EV etc.)?	No. The information behind the locations that make up each PDR/RDRR resources are not made available for tracking.
16	Can PacifiCorp participate in PDR?	Yes. PacifiCorp can have PDR resources participating in EIM. At this time, since PAC didn't register SubLAP, the aggregation has to be within PACE or PACW, but can't cross boundaries.
17	Are the Denial Reasons defined anywhere in the CAISO Demand Response User Guide?	The denial reasons are basically generic conditions that stops the registration approval process from moving forward. It is a trigger point in the review process that alerts the DRP that there is an issue with the registration that requires review and resolution between them and the party (LSE or UDC) to resolve comments submitted. This resolution occurs outside of the ISO registration process.
18	Are the distribution factors determined by an internal CAISO process/estimate? How are the estimates determined?	Yes. These resources were modeled in a pre-defined manner by the ISO. In general, ISO evaluated the load distributions of the PNodes within each SubLAP and modeled them across the highest load buses with weightings based on the total load distribution across them. The modeling of the predefined resources is SubLAP specific. They are not equally weighed across all the PNodes in the corresponding SubLAP for each resource.
19	What is PDR?	Proxy Demand Resource (PDR) is a participation model for load curtail introduced in 2010 to increase demand response participation in the ISO's wholesale Energy and Ancillary Services markets. Additionally, PDR helps in facilitating the participation of existing retail demand response into these markets.
20	What is RDRR?	Reliability Demand Response Resource (RDRR) is a product created to further increase demand response participation in the ISO markets by facilitating the integration of existing emergency-triggered retail demand response programs and newly configured demand response resources that have reliability triggers and desire to be dispatched only under certain system conditions.
21	How many programs are there in DRS?	There are two: Economic (PDR) and Reliability (RDRR).

22	What is the purpose of the PDR & RDRR?	PDR or RDRR is a combination of Load scheduled by a Load Serving Entity at the Default LAP and a Bid to curtail submitted by the Demand Response Provider (DRP) using a separate proxy generator with a distinct Resource ID.
23	What kind of markets can the PDR participate in?	They can participate in DA, RT, Spinning and Non-Spinning Reserves like a generator resource.
24	What kind of markets can the RDRR participate in?	RDRR may participate in the Day-Ahead and Real-Time markets like a generator resource, but may not submit Energy Self-Schedules, may not Self-Provide Ancillary Services, and may not submit RUC Availability or Ancillary Service bids.
25	Can a DRP may participate in the CAISO Markets separately from the LSE?	Yes
26	Can the LSE and UDC review the location information for registration that was requested by a DRP?	Yes
27	Where does the LSE forecast and schedule its load?	At the Default LAP
28	How does the performance of the PDR and RDRR determined?	They are determined through a pre-defined baseline calculation using the last 10 nonevent days with a look back window of 45 days and a bidirectional morning adjustment capped at 20%;
29	Can the DRP who represents the PDR/RDRR submit a written application to the CAISO for approval of a methodology for statistically derived meter data, referred to in this BPM as Generation Data, for the PDR or RDRR that consists of a statistical sampling of Energy usage data?	Yes. Update: ISO has proposed, through the Energy Storage and Distributed Energy Resource ESDER stakeholder initiative, an "approved" statistical sampling methodology that can be used by all participants meeting applicability requirements

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30	What is a DRPA?	A Demand Response Provider Agreement (DRPA) is an agreement must be signed by a DRP and the CAISO and provided prior to requesting a PDR or RDRR Resource ID. As with other CAISO agreements, the Demand Response Provider Agreement will bind the DRP to the CAISO Tariff. This agreement requires that the DRP use a certified Scheduling Coordinator (note, the SC must be certified to submit Settlement Quality Meter Data and have a Meter Service Agreement for Scheduling Coordinators with the CAISO) for all required tariff activities with the CAISO. The Demand Response Provider Agreement requires that the DRP have sufficient contractual relationships with the end use customers, LSE, and UDC and meet any Local Regulatory Authorities' requirements prior to participating in the CAISO Markets. This agreement process will have a ten (10) Business Day turnaround timeframe.
31	How long would it take to become a Scheduling Coordinator?	It could take up to 120 days. A list of certified Scheduling Coordinators is maintained on the CAISO Website, under the reference tab of the operations center page. The DRP must enter into the appropriate contractual relationship with a certified Scheduling Coordinator and notify the CAISO of the Scheduling Coordinator it will be using; this can be done by a letter submitted to the attention of the CAISO's "External Affairs" group. By using a certified Scheduling Coordinator, all requirements, as outlined in the BPM for Scheduling Coordinator Certification and Termination, will be maintained by the Scheduling Coordinator and the DRP would not have to satisfy these requirements (for example: system requirements, credit requirements, demonstration of market proficiency, emergency procedures, and establishing qualifications to submit Settlement Quality Meter Data) independently.

32	What is DRRS?	Demand Response Registration System (DRRS) application enables market participants with the ability to create large volumes of locations and aggregate locations for participation in the CAISO's demand response program. DRRS also provides an Application Program Interface for uploading bulk location data to accommodate the input of the volume of locations participating in the Demand Response Program. Furthermore, DRPs are able to create new location(s) and aggregate existing locations. One of the functionalities of DRRS is to maintain a duplication check of a location within the active registration.
33	What is DRS?	The Demand Response System (DRS) application is used to manage the registration process, meter data submission, and calculate the Demand Response Energy Measurement for PDR and RDRR. In DRS, aggregated locations are also registered, reviewed, verified, and approved. Access to the system will require prior authorization and a digital certificate.
34	What is PDR and RDRR Resource ID?	They CAISO-assigned Resource ID(s) that represent a Proxy Demand Resource or Reliability Demand Response Resource in the CAISO Markets. The Resource ID will be used to bid, schedule, receive an award, receive Automated Dispatches System (ADS) instructions and be settled in the CAISO Markets. There are certain steps that must be accomplished by the DRP, LSE, UDC, and CAISO before the CAISO can assign a PDR or RDRR Resource ID.
35	Are both PDR and RDRR considered as Scheduling Coordinator Metered Entities?	Yes. Each Scheduling Coordinator representing a PDR or RDRR must have a Meter Service Agreement for Scheduling Coordinators (MSA SC) in place that supports its ability to submit Settlement Quality Meter Data (SQMD) to the CAISO.

36	How many days in advance must the historical Meter Data be submitted for the establishment of the PDR or RDRR baseline?	Forty-five (45) calendar days of historical meter data must be submitted once the resource actively participates in the CAISO markets. Failure to submit historical meter data in a timely manner will result in the inability of a baseline for the resource to be established and inability to calculate its performance. This will adversely affect settlement for that resource.
37	When can the forty-five (45) calendar days of historical Meter Data be submitted?	Data can be submitted upon receipt of a PDR or RDRR Resource ID and its approval by the CAISO in the DRS or may be submitted at a later time.
38	Is Baseline and Event Day Meter Data is required for the PDR or RDRR in order to calculate a Demand Response Energy Measurement for an event?	Yes. If either Event Day or historical baseline Meter Data is absent, the PDR or RDRR will have no Demand Response Energy Measurement calculated for Settlement.
39	How should the SQMD be submitted to the DRS for the PDR or RDRR?	They should be submitted as load to the effective registration assigned in the DRS.
40	Is submittal of SQMD is required for all underlying load at the registration level for the PDR or RDRR Resource ID?	Yes. The key aspect of the registration level is that the SQMD for both the baseline and the event day will need to be submitted to the CAISO at the effective registration level for the PDR or RDRR Resource ID.
41	Should the SQMD must be submitted for those trade dates which the resource has received an award for Spinning or Non-Spinning Reserves, Energy or has been dispatched in Real Time?	Yes. Meter Data submittal timelines must be followed pursuant to section 10.3.6 of the CAISO Tariff. Submittal of SQMD on a daily basis is the suggested best practice during those seasons in which the PDR or RDRR is actively bidding into the CAISO markets, to ensure that both Event Day and historical baseline Meter Data is available in the DRS for trade dates that bids are awarded, however, is not a requirement.
42	If there is no SQMD submitted into the DRS by the T+8B Meter Data submittal deadline, what will the CAISO do?	CAISO will continue to use the PDR or RDRR CAISO meter data estimations for the Recalculation Settlement Statement T+12B calculation.

43	If there is no SQMD submitted into the DRS by T+48B Meter Data submittal deadline for the Recalculation Settlement Statement, what will happen?	The CAISO will be unable to create a baseline, nor will it calculate a Demand Response Energy Measurement without available SC-submitted SQMD, even if it was an event day. In addition, CAISO estimated Meter Data will no longer be used in the subsequent Recalculation Settlement Statement.
44	Will the CAISO calculate, account for and settle all charges and payments for Initial Settlement Statement T+3B?	Yes. They will use using CAISO estimates for all load and generation including PDR or RDRR. Therefore, no meter data can be submitted for the Initial Settlement Statement T+3B calculation and Demand Response Energy Measurement for the PDR or RDRR will be based on their Expected Energy and dispatch of that resource as calculated in the Real-Time Market and as modified by any applicable corrections to the Dispatch Operating Point for the resource pursuant to CAISO Tariff Section 11.1.4.
45	What are the requirements for Settlement Quality Meter Data submittal?	Meter Data submittal for PDR or RDRR registrations selecting the CAISO 10 in 10 non-event day selection baseline methodology must be as Load. Meter Data submittal for PDR or RDRR registrations selecting a CAISO-approved statistically derived baseline methodology must be as Generation. Hourly intervals for twenty-four hours for Day-Ahead-only PDR or RDRR. Five (5) minute intervals for twenty-four hours if the resource is participating in Ancillary Services (AS) or Real-Time Markets. Meter Data submittals must include all twenty-four hours for any given trade date. Partial data, incomplete data, or gaps in data will result in the inability of the DRS to calculate a baseline and/or Demand Response Energy Measurement. Five minute Meter Data can be created by parsing 15-minute recorded Meter Data into three equal 5-minute intervals. All data must be submitted in XML Format.
46	Where can I find information on the XML format requirements?	They are listed at the "Technical Interface Specification for DRS Exchange Services" located on www.caiso.com.

47	What is a customer baseline?	Customer Baseline are calculated by the DRS as a value or values based on historical Load meter data in order to measure the delivery of Demand Response Services. The Customer Baseline establishes a method for setting a customer's baseline load, an estimate of how much electricity a customer would have used had it not reduced its use in response to Day-Ahead and Real-Time prices. The Customer Baseline of a PDR is compared against its actual Load for a Demand response event in order to calculate the PDR Energy Measurement.
48	Is there an alternative baseline for Demand Response Energy Measurement?	Yes. Hourly Generation. A Demand Response Provider representing a PDR or RDRR may submit a written application to the CAISO for approval of a methodology for deriving Settlement Quality Meter Data, referred to in this BPM as Generation Data, for the PDR or RDRR that consists of a statistical sampling of Energy usage data (CAISO Tariff Section 10.1.7).
49	Are PDR or RDRR is allowed to have outages?	Yes; however, they are limited to updates to its ramp rates or to modifying its capacity to 0. PDR and RDRR are all-or-nothing resources, which limits how much such resources can be derated. PDR and RDRR are also prevented from submitting a rerated of their PMin. These business rules will be enforced in the Outage Management System (OMS).
50	Can a PDR or RDRR submit PMax derates or Ramp Rate derates in OMS?	Yes. OMS has been updated to allow this permission. Any other data entered in OMS through either the UI or API for a PDR or RDRR Resource ID shall return an error message. It also has validation to restrict PMax derates entries for PDR and RDRR Resource IDs to be only 0 MW. A PMax derate is used to indicate a day should not be used in the baseline calculation. Since a day is either valid or invalid, no partial derates are permitted
51	In order to keep a Resource ID active and reduce the need to make updates to the CAISO Master File, what can the DRP do?	DRP can use its SC to submit extended outage to derate its resource to 0 MW when it does not wish to participate in the market.

52	What is an ALOC?	Aggregate Location. A grouping of one or more locations. Aggregation must be served by the same LSE and located in the same SubLAP for approval by the LSE and UDC.
53	How is the Application User Interface (API) used for DRRS/DRS?	Allows users to upload bulk location data to accommodate the input of the volume of locations participating in the Demand Response Program
54	What does "Assign Pre-Defined PDR" in DRS mean?	CAISO will select a unique pre-established resource ID in the MasterFile for the registration.
55	What is a BUS Pnode?	This is the business that the location ties into and is required if requesting a customer Resource ID. Please note that this data is not consumed nor is it required in DRRS.
56	What is a Customer Resource ID?	A custom resource is a PDR or RDRR resource that requests to be modeled to reflect actual load reduction distributed across specific PNodes within a SubLAP. Custom resource request must go through a full network model build which could take up to 180 days to complete. Customer resources require the DRP to submit specific PNodes and distribution factors for PNodes.
57	What is a DLA Resource?	Default Load Adjustment is not a resource but measurement of PDR or RDRR performance within a specific DLAP. The DLA may be applied to an LSE's DLAP load when the net benefits test is not met by the PDR or RDRR.
58	What is a DLAP?	It is the default load adjustment point.
59	What is a DRP SC?	Demand Response Provider Scheduling Coordinator who are responsible for submitting bids into the market and meter data to the DRS.
60	What is an endorsed user?	Individual(s) outside of the company that is requesting for application access.
61	What is a load reduction?	The total Load Reduction capacity per location.

62	What is an LRCV?	Load Reduction Capacity Value. Total available kW load reduction.
63	What is a location name?	Identifies the location/site for the user.
64	What is a PDR ID?	Proxy Demand Resource (PDR) ID. Resource ID assigned by the CAISO for registration participation in the Demand Response System for the Economic program.
65	What is an RDRR ID?	Reliability Demand Response Resource ID is a unique ID used for participation in the ISO wholesale markets (scheduling/bidding and settlements. This ID is assigned by the CAISO for registration participation in the Demand Response System for the Reliability program. Resource specific information for the ID resides in the ISO Master File.
66	What is a RegID?	The registration ID number assigned to the registration by the Demand Response System; this ID is assigned by the DRS in sequential order.
67	In DRS, what is the purpose of the registration?	A registration is comprise of a single location or an aggregation of many locations. Submitted by the DRP to the LSE, UDC, and CAISO for review and approval. Meter data is also submitted at the registration level for the baseline calculation prior to the market participation.
68	What is a UDC Account #?	This is the account number a DRP receives from a UDC for billing.
69	If requesting for DRRS access, is an AARF required?	No. If the request is for a user within the POC's organization. POC shall submit a request through AIM. If the request is for a user outside of the POC's organization, an AAF is required for DRRS access.
70	What is AIM?	Access Identity Management (AIM) application. The application provides registered POCs with the ability to view application-level access for all of their organization's users as well as any users from other organizations who have access to their resources (endorsed users).

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71	How many types of user roles are there for DRRS?	There are 3 types of roles: (1) DRP, (2) LSE, and (3) UDC. DRP can create/modify locations and ALOCs. LSE can only review location and aggregated location info. UDC can only review location and aggregated location info.
72	What are the functionalities of the DRP?	The DRP can create/modify New Locations, aggregate locations, and manage locations/ALOCs.
73	How many functionalities are there in DRRS?	There are two functionality tabs: (1) Locations, (2) Aggregate Locations
74	How do you obtain a DRP ID?	Once the Demand Response Provider Agreement (DRPA) has been executed, the following shall occur: 1) DRP shall submit a DRP ID request form to CAISO at pdr@caiso.com. The DRP ID request form can be found at http://www.caiso.com/participate/Pages/Load/Default.aspx. 2) After the DRP ID request form has been reviewed and approved, CAISO shall assign a new DRP ID. If the request is denied, CAISO will contact the requester to request for further information. 3) Notification of the newly assigned DRP ID will be sent to the requester via e-mail along with instructions and link to the CAISO Application Access Point of Contact (POC) Establishment and Change Form. 4) Once the POC form has been submitted, the User Application Access Request Form (AARF) will need to be completed and submitted by the DRP. This will allow the DRP to obtain access to the Demand Response System (DRS). Note: Additional system access information, including the AARF, is available on the CAISO website.
75	How do you obtain a LSE ID?	To obtain an LSE ID, LSE shall follow the same steps similar to the DRP ID request process listed above in steps 1-4.

76	How do you obtain a UDC ID?	To obtain a UDC ID, UDC shall follow the same steps similar to the DRP ID request process listed above in steps 1-4.
77	What is the advantage to using a pre-defined Resource ID in DRS?	The use of pre-defined resources allows for quicker assignment of the DRP's Resource ID. Pre-defined resources use pre-established Generation Distribution Factors (GDFs) to allocate the PDR or RDRR performance (generation) to the associated APNodes of the Sub-LAP.
78	What is the advantage to using a custom Resource ID in DRS?	The use of custom resources requires modifications to the Full Network Model and therefore could have a timeline of up to 120 – 180 days for a DRP to apply for and receive a custom Resource ID for use. A custom PDR or RDRR will be designed using historic Demand data (provided by the DRP) for the specific network buses to calculate a unique GDF.
79	What is Demand Response (DR)?	Demand response programs are designed to enable end use customers to contribute to energy load reduction. One form of demand response can occur when an end use customer reduces their electrical usage in response to a price signal, i.e. the price of electricity is high enough that they decide to reduce their usage. Another form of demand response could be a homeowner that allows the electric utility to cycle their air conditioner to reduce the need for electricity during peak periods when electricity is scarce. Large pumps installed in the State water project can provide demand response by curtailing electricity consumption when dispatched by the CAISO in response to their price signal or when there is a shortage of electricity.

80	What DR products does the CAISO offer?	• The California Independent System Operator (CAISO) is charged with ensuring the safe and reliable transportation of electricity on the high voltage transmission system while ensuring diverse resources have equal access to the system and markets. In addition to the existing Participating Load Program (primarily the large pumps mentioned above), the CAISO offers Proxy Demand Response product. • It is important to note that end-use customers able to provide demand response may do so through programs offered by their electric utility. The CAISO's wholesale programs tend to involve larger entities and Demand Response Providers (DRP) that have the ability to aggregate several customers into a product, i.e. a Proxy Demand Resource (PDR) that is then capable of participating in CAISO markets.
81	What is PDR?	PDR is a load or an aggregation of loads that are capable of measurably and verifiably reducing their electric demand. Proxy Demand Resources can submit bids into the wholesale Day Ahead and/or Real Time market and respond to dispatches at the direction of the CAISO.
82	What is Participating Load	A Participating Load is an entity providing Curtailable Demand. Curtailable Demand is Demand from a Participating Load that can be curtailed at the direction of CAISO in the Real-Time dispatch. Scheduling Coordinators (SC) with Curtailable Demand may offer their product to CAISO. Unlike PDRs, Participating Loads must be scheduled within a unique Custom Load Aggregation Point. Participating Loads do not use a base-line energy calculation to determine the amount of energy curtailed and they can only provide non-spinning reserve or participate as curtailable demand in the Real-Time market. Please refer to the Participating Load Technical Standard for additional details about Participating Loads http://www.caiso.com/Documents/AttachmentE1-MarketParticipatingLoadTechnicalStandard_Summer2000.pdf

83	Who can participate in Demand Response?	- The Proxy Demand Resource product allows end-use customers to work through a Demand Response Provider to bid demand response services directly into the CAISO markets. All resources types are offered into CAISO markets through a Scheduling Coordinator. Thus, to bid proxy demand resources into the CAISO markets, a Demand Response Provider must be a Scheduling Coordinator or hire the services of an ISO certified Scheduling Coordinator to submit bids and schedules on their behalf. - Participation in a Proxy Demand Resource could be by: o A large end-use customer acting as its own demand response providero A demand response provider who aggregates end-use customer loads **Note:** Direct access customers and utility bundled customers can currently participate under a Proxy Demand Resource in the CAISO market. End use customers must be within the ISO control area to participate. The ISO does not have DR products at the interties.
84	What is a CSP/DRP?	A CSP is a Curtailment Service Provider and a DRP is a Demand Response Provider. Both are common terms for an entity that provides demand response services to electricity customers and, who can in-turn, offer the load adjustment capability of those customers as a demand response resource into the wholesale electricity markets. The CAISO prefers and uses the term Demand Response Provider (DRP). This is an entity that executes the Proxy Demand Resource Agreement and will facilitate demand response from Proxy Demand Resource(s) within the CAISO wholesale market.
85	Can ISO provide a list of DR participants that provide emergency back-up services?	No. ISO does not collect of provide information on emergency back-up services.

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86	If the DRP has some PDRs that are no longer available for the season, does the ISO have a preference for dealing with such instances? Should the DRP terminate the registration of those resources and then re-register them later on when they're needed or place the PDR Resources on-hold?	They resources do not have to be end dated, just make sure, they do not bid into the market. They could potentially put in an Outage for the other season, but we would have to verify that is an acceptable use of outage management.
87	Will the telemetry requirements be specified as an existing standard like DNP3 or Open ADR, or in a manner unique to CAISO?	The standards are currently CAISO standards but include DNP3. This standard is ONLY FOR communication between the CAISO and the RIG which can be used as an aggregation/concentration point. The communication standard between the RIG and underlying locations that make up the PDR is not specified by the CAISO and can be Open ADR if that is the protocol used. BPM Section 5.6 Protocols - "The protocol required between the RIG and the CAISO's EMS is DNP 3 with PKI security."

88	What will the telemetry requirements be for?	Much if not all of this information is provided in the CAISO Business Practice Manual for Direct Telemetry. Please review and determine if there are specific questions you have to what is in that document.
		
		Link to BPM: https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Direct%20Telemetry
		
		a) **Latency**
		Please refer to the following BPM sections:
		6.2 Performance Monitoring
		6.2.1 Direct Telemetry Timing Requirements
		6.2.2 PDR Timing Requirements
		Telemetry is required every 4 seconds – PDR is allowed a 1 minute scan rate between the RIG and resources underlying locations – NOTE: this will be expanded to 5 minute scan rate for energy only participation in coming months.
		b) **Accuracy**
		BPM section 5.5
		"All telemetry data reported via the RIG must be within +/-2% of the true value.The CAISO or its designee may inspect the resource owner's RIG and related facilities to verify the accuracy and validity of all data telemetry to the CAISO. The CAISO reserves the right to periodically audit and re-verify the accuracy and validity of all telemetry data. In addition, the CAISO's verification activities will be coordinated with the resource owner at least 24 hours in advance. "
		   i. Real-time this is accuracy for telemetry data described above
		   ii. Post-DR event Telemetry data is not required after real-time. Data submitted after the dispatch is submitted for settlement purposes. This would be the accuracy required for Settlement Quality Meter Data outlined in the CAISO BPM for Metering: Attachment A:"All metering is of a revenue class metering accuracy in accordance with the ANSI C12 standards on metering and any other requirements of the relevant UDC or Local Regulatory Authority that apply. Such requirements apply to meters, current transformers, potential transformers, and associated equipment. ANSI C12 metering standards include the following:""ANSI C12.20 – American National Standard for Electricity Meters 0.2 and 0.5 Accuracy Class"
		c) **Format**
		   i. Variables reported (kW, kVA, PF, etc.) for telemetry see BPM for Direct Telemetry section 14.1 PDR Point Requirements. Telemetry is provided in MW.For Settlement Quality Meter Data SQMD see BPM for Metering section 12.6. Unit of measurement is kWh
		   ii. Metadata (Site name, utility account number, Sub-LAP) not required. For telemetry (real-time data), CAISO recognizes a Resource ID only.
		d) **Delivery**
		   i. Push vs. pull from the DR provider
		   ii. API endpoint vs. other network structuresTelemetry: The CAISO's EMS will interrogate the RIG for telemetry data - pull the data every 2 seconds. SQMD: Submitted to the Demand Response System (DRS) via UI or API.

		e) **Security**
		    i. Public endpoint with Web security
		    ii. Private controlled-access WAN both security measures are supported. See section 5 in the BPM for Direct Telemetry of options. Additionally, for the private ECN options please see the following service guide providing additional options:
		http://www.caiso.com/Documents/ISOConnectedEntityServiceGuide.pdf
		
		NOTE: This secure connection is only required between the CAISO and the DRP's RIG which can provide telemetry for a number of different PDR's. It does not reflect requirements between the DRP's RIG and underlying aggregated PDR locations.

89	What form will the real-time market dispatch take?	Real time market dispatch is submitted to the scheduling coordinator via the CAISO's Automated Dispatch System (ADS). Technical documentation can be found at http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=336A3FEF-FF9B-4ED5-910C-5535D62A3A55
90	Will the real-time market dispatch be built on existing CAISO generator dispatch standards?	Yes.
91	How will the real-time market dispatch vary from them, if at all?	Does not vary. It is the same as any generator schedule/dispatch.
92	What will the dispatch communication cycle be?	Communication is provided under the same timelines as current participating generators through Day Ahead Market results and Real Time dispatching. This is for the various communication exchanges that happen as the contracted window of service approaches. There is no special communication exchanges with PDRs, it follows the same communication (Day Ahead and Real Time) as any other participating generator.

93	How are participants expected to communicate in the real-time dispatch market? Via a web-based portal that CAISO provides, via automated APIs, or other methods?	There is no real time communication, just a response. Market results are obtained in the Customer Market Results Interface CMRI (via UI or API) http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=ED9E3AB0-12F0-4ED7-A891-29218B8C91EDReal Time Dispatches via ADS the Automated Dispatch System