BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies and Protocols for Demand Response, Load Impact Estimates, Cost-Effectiveness Methodologies, Megawatt Goals and Alignment with California Independent System Operator Market Design Protocols	Rulemaking 07-01-041 (January 25, 2007)

COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR RE: ALJ RULING REQUESTING INFORMATION ON EMERGENCY-TRIGGERED DEMAND RESPONSE

Dated: June 25, 2008

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In her June 9, 2008 ruling in this proceeding, ALJ Hecht has posed three questions to the CAISO, asking that we provide comments, to which other parties may then respond, on the subject of emergency-triggered demand response[1]. Pursuant to the Request Ruling, the California Independent System Operator Corporation ("CAISO") submits these comments.

I. INTRODUCTION

A. Background

The Commission has framed four broad-sweeping demand response (DR) goals for this proceeding: 1) establish load impact protocols to address measurement and evaluation; 2) develop cost-effectiveness methodologies; 3) set DR goals for 2008 and beyond; and 4) consider modifications to DR programs to support CAISO efforts to incorporate DR into market design protocols[2] The Scoping Memo noted that:

> These goals reflect the Commission's priorities for DR, which include (1) improving future DR programs by determining and then emphasizing strategies with a proven, verifiable effect on electricity demand that are cost effective, (2) integrating DR into the utilities' electricity resources' procurement efforts, and (3) better aligning programs with the CAISO planning process.[3]

The proceeding has been broken down into phases. Phase 1 has focused on activities to further the first two OIR goals, which reach to DR program metrics. The parameters of Phase 2 are described both in the Scoping Memo and in the joint Assigned Commissioner's and Administrative Law Judge's Ruling, dated October 1, 2007, which revised somewhat the Phase 2 process. Phase 2 focuses on "development of measurable

[1] Administrative Law Judge's Ruling Requesting California Independent System Operator Information on Emergency-Triggered Demand Response, dated June 9, 2008, (the "Request Ruling").
[2] OIR dated January 25, 2007 at p. 1, cited in The Assigned Commissioner and Administrative Law Judge's Scoping Memo and Ruling dated April 18, 2007 (the "Scoping Memo") at p. 3.
[3] Scoping Memo at p. 3.

goals that encourage types of DR activities that are consistent with state policy."[4] The Assigned Commissioner and ALJ have noted that:

> The goals developed in this proceeding need not take the same form as the goals previously adopted for 2003-2007, which addressed the reduction of annual peak load (in megawatts or as a percent of peak) from non-interruptible DR activities. Similarly, the determination of what DR activities count towards the goals may differ from those used in the past, and may or may not be the same as used for resource adequacy. In developing these goals, the Commission will consider the CAISO's need for accurate information on the amount and conditions for availability of DR in order to incorporate DR into its market design, forecasting, and procurement.[5]

To date, Phase 2 activities have included an Energy Division Staff report and proposal for DR goals, and party comments to staff proposal in November and December 2007.

B. The ALJ Request Ruling

The ALJ's Request Ruling notes that party comments on the record have voiced general support for the staff proposal, but also have suggested possible additions and changes to the qualitative goals. In this regard, the ruling notes that the CAISO has consistently advocated that the Commission move away from emergency-triggered DR programs, and towards more flexible types of DR.[6] ALJ Hecht also notes that TURN, DRA, and the CAISO have suggested that the amount of DR from emergency-triggered programs be frozen at a maximum of the current level, and that existing programs should then be transitioned to reduce the amount of emergency triggered DR and increase the amount of DR that will work with the CAISO MRTU (Market Redesign and Technology Update). (Request Ruling at p. 3.)

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[4] October 1, 2007 Ruling ("Ruling Revising Phase 2") at p. 1.
[5] Ruling Revising Phase 2 at p. 2, quoting from the Scoping Memo at p. 9. We note that the recent and current DR program cycles have been 2003-05 and 2006-08, and that the IOUs have filed their DR Applications on June 2, 2008 for the 2009-11 program cycle.
[6] (Request Ruling at p. 2.) We note that the focus of the CAISO's position is and has been that the Commission should move away from the practice of allowing emergency-triggered DR to qualify as resource adequacy capacity.

The Request Ruling seeks to augment the record in this regard:

> In reviewing the comments and responses, it has become apparent that additional information is needed to develop appropriate qualitative DR goals related to balancing emergency-triggered DR with DR activities that are better integrated with the planned MRTU. This ruling requests specific information and analysis from CAISO identifying the amount of emergency-triggered DR needed to mitigate future emergency situations. Parties will then have an opportunity to comment on the information and analysis provided by CAISO; this will complete the record on these issues and enable the Commission to refine its qualitative goals related to price-responsive and emergency DR. (Request Ruling at pp. 3-4.)

Accordingly, the ALJ has posed three questions to the CAISO:

- *How much emergency-triggered demand response (in megawatts) does the state need to have available to mitigate future declared electricity emergencies?*
- *How was this amount determined? Please provide some analysis in support of the recommendation; and*
- *How does the estimated amount needed compare to the amount of emergency-triggered demand response currently available?*

II. ANALYSIS AND DISCUSSION

A. Initial Comment to All Questions

The CAISO submits that its responsive comments to the ALJ's three questions must be placed in the following context. The CAISO recognizes, at the outset, that the ALJ's questions are directed more towards the subject of determining a level of desired service reliability for Utility Distribution Company ("UDC") end use customers, which is a somewhat different subject than that of maintaining systems operation for the bulk power grid, which is the core mission of the CAISO. It is from the perspective of the power grid operator that CAISO has repeatedly stated, as the ALJ has noted in her ruling, that:

> These emergency triggered DR programs are useful to mitigate the emergency (i.e. as an alternative to load shedding), but [are] not useful in the forward or real

> time markets to reduce demand or operate as a generation resource substitute for the provision of ancillary services.[7]

Once an emergency situation occurs on the grid, systems operations will be managed and grid reliability maintained by instructing firm load shedding, after all available generation resources and inter-control area options are utilized, and should no other load curtailment options or load management schemes exist.[8] The CAISO's core reliability function is to ensure the efficient use and reliable operation of the transmission grid, consistent with the achievement of planning and operating reserve criteria no less stringent than those established by the Western Electricity Coordinating Council ("WECC") and the North American Reliability Corporation ("NERC"). In contrast, serving end-use load and providing for service reliability is a core function of the UDC.

Accordingly, we focus on generation and non-generation resources from the standpoint of Resource Adequacy ("RA"). The Commission's prior articulation of the concept bears repeating:

> Resource procurement traditionally involves the Commission developing appropriate frameworks so that the entities it regulates will provide reliable service at least cost. This involves determining an appropriate demand forecast and then ensuring that the utility either controls, or can reasonably be expected to acquire, the resources necessary to meet that demand, even under stressed conditions such as hot weather [footnote omitted] or unexpected plant outages. 'Resource adequacy' seeks to address these same issues. In developing our policies to guide resource procurement, the Commission is providing a framework to ensure resource adequacy by laying a foundation for the required infrastructure investment and assuring that capacity is available when and where it is needed." (D.04-01-050, pp. 10-11.)

From the CAISO's systems operations perspective, we consider the primary value of emergency DR programs to lie in their ability to provide an *ex ante* order of priority to

[7] Comments of the California Independent System Operator on Goals, Pursuant to Assigned Commissioner's And Administrative Law Judge's Ruling Revising Phase 2 Activities and Schedule, dated November 26, 2007, pp. 5-6; *see also* Response of the California Independent System Operator to ALJ Ruling Setting Forth Additional Issues for Further Comment on Cost Effectiveness, dated November 19, 2008, at p. 10.

[8] CAISO Operating Procedure E-508 provides that the CAISO must commence shedding of firm load, when conditions threaten the CAISO's ability to maintain the CAISO's Spinning Reserve requirement, a requirement which is specified by the WECC Operating Reserve Criteria.

load shedding, when grid reliability is threatened. This mechanism substitutes for the less socially desirable approach of implementing a series of immediate geographic rotating outages, in which all loads on electric circuits are disconnected. Such load prioritization is not a core function of the CAISO, even though such emergency response capability, if available, is useful to the grid operator for managing system conditions. A prioritized system that can incrementally reduce loads will help the grid operator prevent more broad-ranging, involuntary firm load shedding, by preserving the capacity of the resources that are providing the CAISO's minimum required levels of operating reserves.

B. Addressing ALJ Questions One and Two

- *How much emergency-triggered demand response (in megawatts) does the state need to have available to mitigate future declared electricity emergencies?*

- *How was this amount determined? Please provide some analysis in support of the recommendation*

1. Methodology Utilized to Respond to the Questions; A Three-Track Analysis Approach

In formulating these comments, the CAISO has vetted the questions within the organization, queried other industry officials, and considered past and present good utility practices. Since determining the exact amount of emergency-triggered DR could be considered as more of an art than science, we have taken an approach that seeks to develop a solution based on three different perspectives of the same issue. Each of these three pertinent lines of analysis focuses on a different set of criteria and suggests somewhat different outcomes.

Basis 1: Historic Load Shedding Events and MW Quantities Shed—This approach tends to identify a lower range of megawattage as sufficient.

Basis 2: Protecting Spinning Reserves and Minimizing the Potential for Firm Load Shedding—Utilizing these criteria tends to identify a higher range of megawattage as necessary emergency-triggered DR.

Basis 3: Comparison to What Other ISOs/RTOs Carry With Respect to Similar Emergency DR Products—This criteria also indicates that a relatively low MW level of emergency-triggered DR is sufficient.

2. **Discussion**

(1) Basis 1: Historic Load Shedding Events and MW Quantities Shed

This approach focuses on data pertaining to historical load shedding events, distributed over a representative period of time (indicative of frequency) and supplemented by the additional data points of the Emergency level (indicating magnitude) and the quantities of MWs of load shed and type of load shed (firm versus non-firm) during those events (indicative of magnitude and, to some extent, duration).

CAISO emergency declarations can be associated with either i) a system emergency, tied to insufficient electric supply and Operating Reserve levels within the control area, or ii) a transmission emergency, when transmission line overloads, losses, or limitations occur. The following tables provide a summary of system and transmission emergencies, since the CAISO's inception in 1998 through 2007, minus data from the energy crisis of 2000 and 2001:

Historic Cumulative Totals of CAISO Declared Emergencies (MW) **

TABLE 1	1998	1999	2002	2003	2004	2005	2006	2007	Average:
Transmission Emergency	0	0	0	0	6	5	0	4	1.9
Stage 1	7	4	2	1	1	1	3	1	2.5
Stage 2	5	1	1	0	0	2	1	0	1.3
Stage 3	0	0	0	0	0	0	0	0	0

*** Source: CAISO website at http://www.caiso.com/docs/09003a6080/08/8a/09003a6080088aa7.xls (accessed June 23, 2008). Anomalous data from the energy crisis period of 2000 – 2001 has been excluded.*

Table 2, below, summarizes annual data for the number of times (events) and quantity (MW) of non-firm load, associated with an emergency-triggered demand response program, that was shed as a result of either an operating reserve shortage or a transmission emergency.

Non-firm Load Shed Quantities by Year (MW) **

TABLE 2	1998	1999	2002	2003	2004	2005	2006	2007	Totals:
Events*	4	1	2	0	4	3	1	0	15
Min	320	1155	792	0	8	200	855	0	8
Max	1940	1155	1320	0	628	700	855	0	1940
Median	869	1155	1056	0	175	230	855	0	543
Average	999	1155	1056	0	247	377	855	0	586

** Events are counted whenever a non-zero non-firm load shed quantity is recorded.*
*** Data is approximate based on information provided to the CAISO by the UDC. Anomalous data from the energy crisis period of 2000 – 2001 has been excluded*

Table 3 summarizes annual data for the number of times (events) and maximum quantity (MW) of involuntary firm load shedding that occurred on the system, associated with an emergency condition. Each event in 2004 and 2005 was associated with a transmission emergency, rather than an operating reserve shortage.

Firm Load Shed Quantities by Year (MW) **

TABLE 3	1998	1999	2002	2003	2004	2005	2006	2007	Totals:
Events*	0	0	0	0	1	1	0	0	2
Max	0	0	0	0	250	900	0	0	900
Average	0	0	0	0	250	900	0	0	575

** Events are counted whenever a non-zero firm load shed quantity is recorded.*
*** Data is approximate based on information provided to the CAISO by the UDC. Anomalous data from the energy crisis period of 2000 – 2001 has been excluded*

Table 4 details the greatest quantity (MW) of firm and non-firm load shedding that was associated with a single emergency event on the grid.

Greatest Coincident Load Shed Quantity (Firm & Non-firm) (MW) *

Table 4	Non-firm Load	Firm Load	Total:
August 25, 2005	700	900	1600

**Due to the loss of a high voltage DC converter on the Pacific DC intertie. During this event, 700 MW of Non-firm and 900 MW of Firm load, for a total of 1600 MWs, were shed.*

Based on historical system and transmission emergency data and associated load shedding events, the CAISO would recommend the CPUC focus on the past five years of operations (2003-2007) in evaluating the amount of emergency-triggered DR that may be useful for enhancing service reliability. The past five-years represent a period that is post energy crisis/post CAISO start-up and reflects a more mature period in the wholesale markets. We have excluded the period of the 2000-2001 energy crisis, as we have concluded that systems circumstances and market abnormalities during this period were of such a nature as to make this historical period unrepresentative and un-useful for analysis.

Over this time period, the CAISO's minimum operating reserves were below or forecasted to be below minimum standards, with varying severity. In summary, the

CAISO declared seven Stage 1 Emergencies[9], only three Stage 2 Emergencies and no Stage 3 Emergencies between 2003 and 2007. Those load shedding events that did occur were attributed to transmission emergencies, where fifteen such events occurred over the past five years. In two of those years, the CAISO shed the following firm load: year 2004, 250 MW, and in year 2005, 900 MW.

Conclusions Indicated by Historical Approach In drawing conclusions from this approach, the CAISO assumes that the RA program does indeed fulfill its intended purpose of ensuring that sufficient capacity is available to the grid when and where needed. With this assumption, the CAISO submits that the CPUC may consider having additional emergency response capability to cover such unforeseen situations as transmission emergencies, which have caused the only firm load shedding events in the past five years, in an effort to protect citizens and prevent firm load shedding. Based on historical data, which captures a severe outage on the Pacific Direct Current Intertie ("PDCI")[10] occurring in August 2005 that resulted in firm load shedding, the CPUC could consider between 500 MW and 1000 MW of emergency demand response capability to be activated on rare and infrequent occasions to help counter-act the affects

[9] The CAISO will declare a Stage 1 Emergency any time that it is clear that an Operating Reserve shortfall (i.e. a reserve less than WECC MORC minimum standard) is unavoidable, or, when, in real-time operations, the Operating Reserve is forecast to be less than the minimum standard, after utilizing available resources.
The CAISO declares a Stage 2 Emergency any time that Operating Reserve depletes or is anticipated to drop below 5% of Load Responsibility and cannot be restored.
The CAISO will declare a Stage 3 Emergency any time that the Spinning Reserve portion of Operating Reserve requirement deplete or is anticipated to drop below the WECC Operating Reserve Criteria and cannot be restored.

[10] A CAISO Report discussing the Pacific DC Intertie Loss and load shedding impacts is posted on the CAISO web site at http://www.caiso.com/14c2/14c2a0985f9a0.pdf (last accessed June 24, 2008). The incident occurred on August 25, 2005. One pole of the PDCI blocked, and within seven minutes the PDCI was taken out of service. As a result, 2,249 MW of generation tripping occurred in the Pacific Northwest (automatically by way of a Remedial Action Scheme (RAS)). In addition, weather/load forecast errors in South of Path 26 (SP26) had resulted in under forecasting of load by as much as 2,937 MW.

As a result of both the forecast error and the PDCI going out of service, both interruptible and manual firm load shedding totaling approximately 1,750 MW was utilized in the CAISO Control Area to maintain reliability of the interconnected grid. Of the total load interrupted, firm load comprised about 950 MW and was restored after 40 minutes while the remaining 806 MW comprised of interruptible load and was restored after 77 minutes.

of such events. These values are equivalent to 1-2 percent of the CAISO system peak demand.

(2) Basis 2: Protecting Spinning Reserves and Minimizing the Potential for Firm Load Shedding

This analysis approach focuses on maintaining the resource component known as "Spinning Reserve" that is needed by the system operator for compliance with applicable reliability standards. In this regard, our second approach posits that the CPUC might consider emergency triggered demand response as a complement to Spinning Reserves, to reduce the risk of firm load shedding.

Spinning Reserve is reserved capacity provided by resources that are synchronized to the grid (i.e., "spinning") with additional capacity that is capable of ramping over a specified range within 10 minutes and capable of running for at least two hours, if required. The CAISO needs Spinning Reserve to maintain system frequency during emergency operating conditions and unanticipated variations in load.

In general, Non-Spinning Reserve is reserved capacity provided by resources that are available, but are not running. These resources must have the capability to become synchronized to the grid and ramp to a specified level within 10 minutes, and must be capable of running for at least two hours in duration, if required. The CAISO needs Non-Spinning Reserve to maintain system frequency during emergency conditions.[11] From a functional perspective, appropriately configured curtailable demand can supply Non-Spinning Reserve, provided that it is telemetered and capable of receiving dispatch

[11] In total, the CAISO must maintain minimum amounts of Regulation, Spinning, and Non-Spinning Reserves to meet WECC and NERC control performance criteria. The quantity of Spinning Reserve and Non-Spinning Reserve that must be maintained is calculated as (a) 5 percent of the Demand (except the Demand covered by firm purchases from outside the CAISO Control Area) to be met by Generation from hydroelectric resources plus 7 percent of the Demand (except the Demand covered by firm purchases from outside the CAISO Control Area) to be met by Generation from other resources, or (b) the single largest Contingency, if this is greater or (c) by reference to such more stringent criteria as the CAISO may determine from time to time.

instructions and performing accordingly within 10 minutes. However, emergency triggered DR, because of its configuration and unavailability, cannot serve this function.

The CAISO may declare a System Emergency for any event that inhibits the CAISO's ability to safely and reliably operate i) the grid or ii) the energy markets, through normal modes of operation. In particular, a Stage 3 Emergency must be declared, and firm load shedding must commence, when conditions threaten the CAISO's ability to maintain the CAISO's Spinning Reserve requirement, a requirement which is specified by the WECC Operating Reserve Criteria. [12]

Some level of emergency-triggered DR can be applied as emergency response for purposes of protecting the Spinning Reserve portion of the operating reserve requirement, though not by acting as Spinning Reserve. Emergency-triggered DR is not dispatchable or frequency responsive, and so cannot act as Spinning Reserve. However, this emergency response capability could act as a way to reduce the load under extreme/contingency conditions, to prevent declaring a Stage 3 Emergency, by preserving the spinning reserve capacity on the system.

In this regard, if the operating reserves needed to support the load were degraded, then an alternative way to balance the system is to drop load, rather than to add spinning reserve capacity. Emergency triggered DR, if triggered at a Stage 2 Emergency, does serve this function, providing its capability as a hedge against a Stage 3 Emergency declaration and, therefore, firm load shedding. To draw an analogy, the circumstance is like a bridge extending over a cresting river that is rising to the point of inundating the structure; to protect the bridge, and keep it in operation, one approach to the problem is "don't raise the bridge, lower the water."

[12] WECC MORC states that Spinning Reserve shall be no less than 50% of the total Contingency Reserve requirement.

In 2007, the CAISO's spinning reserve requirement was, on average, 756 MW per hour, and the maximum and minimum hourly requirements were 1,490 MW and 531 MW, respectively.

Conclusions from this Approach Applying this analysis, the CPUC might consider some portion of emergency-triggered DR as a form of Spinning Reserve complement, to preserve Spinning Reserve, as described above. From this perspective, the CPUC might wish to consider a MW level between 700 MW and 1,500 MW, representing the hourly average and maximum spinning reserve requirement of the CAISO, as a hedge against a Stage 3 Emergency declaration. However, during the past five years, the CAISO has not declared a Stage 3 Emergency, a fact noted in the data pertaining to Basis 1, above. Therefore, while the level of emergency DR capability can be set to the level of 700 to 1500 MW, the low probability that a Stage 3 event might occur raises an economic value question (wherein the costs of DR products that earn a capacity payment would be weighed against the probability that a Stage 3 event could occur).

(3) Basis 3: Comparison to What Other ISOs/RTOs Carry in Similar Emergency DR Products

Other ISOs and RTOs operate "emergency responsive" programs. However, most of these programs are triggered or configured so differently that they do not serve as appropriate comparisons to the types of emergency-triggered programs that the California IOUs currently operate, and. in particular, the California Base Interruptible Program is not meaningfully comparable to any other program. For instance, NY ISO's Emergency Demand Response Program and its "Special Case Resources ICAP Program" are programs designed to address critical and stressed conditions on the NY ISO grid. In contrast to California's programs, however, the NY ISO programs can be notified on a day-ahead basis, and the NY ISO uses them to prevent an emergency from occurring

rather to recover from an emergency; thus the programs can be used in advance of an emergency declaration.

Based upon our survey of other ISO/RTO programs, the CAISO considers ERCOT's Emergency Interruptible Load Service (EILS) program to represent the most similar program to the reliability-based, emergency-triggered DR programs offered by California's IOUs. Moreover, ERCOT has established a clear upper limit on the amount of EILS it is willing to procure, a feature which is useful for purposes of considering the ALJ's questions.

The purpose of ERCOT's EILS program is "to provide ERCOT Operations with an additional emergency tool to lessen the likelihood of involuntary firm load shedding (a.k.a. rolling blackouts)."[13] The EILS program is a service provided by loads willing to interrupt immediately prior to the need for involuntary load shedding.

Importantly, ERCOT's documentation states that the EILS program is not any of the following:

- A market-based program that bids into ERCOT's day-ahead or real-time markets;
- A resource that is deployed ahead of market resources;
- A backstop for insufficient planning reserve margins, or a tool to meet long-term capacity needs

[13] Taken from ERCOT Texas Public Utility Commission Demand Response Workshop Presentation document entitled "ERCOT Emergency Interruptible Load Program" for a PUC Demand Response Workshop, dated Oct. 2, 2006, Slide 6 (hereinafter, "ERCOT Presentation"). This presentation can be accessed on ERCOT's web site at: http://www.ercot.com/content/news/presentations/2006/Interruptible_Load_Program_Demand_Response_Workshop_10-2006.pdf (accessed June 24, 2008).

ERCOT makes an explicit point that the EILS program will not impact the reserve margin and "[w]ill not be part of the reserve margin calculation."[14] ERCOT believes that the advantages of its EILS program are that:

- Shedding voluntary load from prepared end-use customers is preferred over involuntary load shedding from unprepared customers; and
- The EILS program cost will be lower than the societal cost of rolling blackouts.

The EILS program size is determined based on "averting historical firm load shedding events…"[15] This approach would be analogous to our Basis 1 approach, described above. The size limit imposed by ERCOT on the EILS program is 1,000 MW, which equates to approximately 1.6% of ERCOT's all-time system peak of the 62,337 MW.[16]

Conclusions From This Approach Applying this same percentage to the CAISO, whose all-time system peak was 50,200 MW,[17] would equate to carrying approximately 800 MW of emergency demand response capability.[18]

3. Overall Conclusions, RE Desired Megawattage Level of Emergency Triggered Demand Response

The CAISO has looked at this issue from three perspectives, detailed above, each of which suggest a somewhat different outcome.

Basis 1: Historic Load Shedding Events and MW Quantities Shed. Using this approach, the suggested outcome is that the CPUC might

[14] ERCOT Presentation, Slide 7
[15] ERCOT Presentation, Slide 22
[16] ERCOT New Bulletin, Dec. 5, 2007 found at: http://www.ercot.com/news/press_releases/2007/nr12-05-07 (accessed June 24, 2008).
[17] California ISO Peak Load History - 1998 through 2007 showing megawatts, date and time found at: http://www.caiso.com/1fb4/1fb4af6c73260.pdf (last accessed June 24, 2008.)
[18] This number is rounded down from 803 (52000MW times 1.6% = 803MW).

consider between 500 MW and 1000 MW of emergency demand response capability.

Basis 2: Protecting Spinning Reserves and Minimizing the Potential for Firm Load Shedding. Under this approach, the suggested outcome is a megawatt level in the range between 700 MW to 1,500 MW, to address the CAISO's hourly average and maximum spinning reserve requirement over a year.

Basis 3: Comparison to What Other ISOs/RTOs Carry With Respect to Similar Emergency DR Products. Using this approach, and applying the 1.6% percentage of all-time system peak metric, used by the ERCOT, to the CAISO's all-time system peak of 50,200 MW, indicates a level of 800 MW of emergency demand response capability.

CAISO Conclusion as to Appropriate Megawatt Level

The CAISO has considered the data points and suggested outcomes of the analytical approaches discussed above, together with our consideration of institutional CAISO operator judgment and experience. Based upon the foregoing, it is the overall perspective of the CAISO that a range of 500 to 1000 MW, corresponding to a range between 1 and 2 percent of peak system load, is an appropriate quantity of emergency-triggered DR that would be useful to the system during serious system emergencies, to help prevent involuntary firm load shedding.

TABLE 5 Analysis Summary

Method	BASIS 1 ***Historical Data***	BASIS 2 ***Protect Spinning Reserves***	BASIS 3 ***Other ISO Practices***	Overall CAISO Perspective
Quantity	**500 MW to 1,000 MW**	**700 MW to 1,500 MW**	**800 MW**	**500 MW to 1,000 MW**
Percent of CAISO Peak*	**1% to 2%**	**1.4% to 3%**	**1.6%**	**1% to 2%**

**Based on CAISO system peak demand of 50,200 MW*

These Megawatts Should Not Be Counted For Resource Adequacy

The CAISO's comments carry with them CAISO's express and oft-repeated caveat that any emergency-triggered DR programs should not "count" as Resource Adequacy ("RA") capacity. As the Commission has previously recognized, to the extent the CAISO must commit non-RA resources to serve the forecasted demand, there will be a cost consequence to the current treatment of these resources as resource adequacy resources. Indeed, the CAISO submits that cost consequence may offset the purported economic justification for counting emergency-triggered DR programs as a RA resource in the first instance.

Accordingly, the CAISO urges the Commission to articulate that its going-forward policy will be to work toward excluding emergency-triggered DR programs from the RA program, and that it will continue to pursue efforts to ensure DR program characteristics that align with the Commission's RA and DR objectives. The Commission must then consider the economics of this type of resource. As a result, the Commission's final determination of how much emergency-triggered DR it deems appropriate may be on the lower side of the range that the CAISO has articulated. If this is the determination of the Commission, the CAISO can support such a reduction from current levels.

4. In the Near Future, Better Tools Will Exist to Perform the Cost-Benefit Assessment Inherent in the ALJ's Questions

Clearly, all Commission-sponsored programs have a cost associated with their existence. In the case of emergency-triggered DR, the Commission faces the challenge of evaluating the service reliability benefits against these costs. The CAISO observes that, in the near future, the CPUC will have the potential to employ a more sophisticated

method to determine the cost-benefit of carrying a quantity of emergency-triggered demand response that is above and beyond the Planning Reserve Margin.

In Rulemaking 04-08-012, the Commission is undertaking the task to develop a method to revise the Planning Reserve Margin associated with the Resource Adequacy program. At the CAISO, we plan to issue our first Planning Reserve Requirements Study (PRRS) in the third quarter of 2009 (Q3 2009) timeframe[19]. In this study, the CAISO will be undertaking a probabilistic analysis, using the industry-accepted one-day-in-ten-years (i.e. one-in-ten) loss of load expectation (LOLE) criterion, to derive the planning reserve margin. The study results will provide the CAISO, the Load Serving Entities (LSEs) within its Controlled Area, State energy regulatory agencies, regional reliability organization, and other interested parties with the understanding of long-term planning reserve requirements, based on industry-accepted reliability metrics.

The PRRS will be the first long-term planning reserve requirements study that the CAISO will undertake. It is proposed that the CAISO will undertake this study every three years, to evaluate long-term planning reserve requirements for a ten-year planning horizon. The nature of the study will be to investigate the relationships between different relevant factors and sensitivities, such as load shapes/forecasts, hydro conditions, resource additions, forced outage rates, etc., and various pertinent parameters, such as system topology, etc., that figure into a Loss of Load Expectation ("LOLE"), for system reliability planning purposes. One such parameter and possible sensitivity analysis is the

[19] OIR issued April 16, 2008 in R.08-04-012. As the opening paragraph of the OIR explains:

> We open this rulemaking to review, and modify to the extent found to be appropriate, the planning reserve margin (PRM) used for purposes of our Long-Term Procurement Planning (LTPP) and Resource Adequacy (RA) programs. We do so to bring greater policy clarity and certainty to California's electricity market and to ensure that our LTPP and RA programs are designed to yield the level of reliability that ratepayers demand. We will examine, among other things, the assumptions and methodology used to set the PRM, whether to recalibrate the PRM periodically, whether to establish a single PRM that applies throughout the service territories of utilities under our jurisdiction, whether to establish separate short-term and long-term PRMs, and how best to coordinate our PRM determinations with the needs of the California Independent System Operator (CAISO). (OIR at p. 1.)

level of reliability improvement that could be achieved for the average bundled customer if emergency-triggered demand response were used as a "safety valve," to reduce system load, under different scenarios. In this way, policy markers could evaluate the cost-benefit of differing levels of emergency-triggered DR on system reliability. The capability to perform such an analysis should be in place, at the earliest, in the Q3 to Q4 2009 timeframe.

C. Addressing ALJ Question Three

- *How does the estimated amount needed compare to the amount of emergency-triggered Demand Response Currently Available?*

The utility demand response programs information, set forth below, is broken down into i) price-responsive programs and ii) reliability-based programs (aka "emergency-triggered"). Price-responsive programs are generally triggered Day Ahead or Day-of, based on non-emergency/price-related triggers. On the other hand, the reliability-based programs are only triggered during emergency conditions, which, as mentioned above, arise from either a system emergency or a local transmission emergency.

In analyzing IOU DR program participation, it is also useful to distinguish between enrolled MWs and expected MWs, in order to gage the historical effectiveness of the programs. Enrolled MWs represent the total MWs that have been subscribed under each demand response program, without consideration of compliance or performance. In contrast, expected MWs represent the load reduction the IOU may expect to obtain during a demand response event, based on the historical compliance or performance of each program. The Table below sets forth, the aggregate number of MWs actually enrolled, versus expected, in each demand response category (price-responsive and reliability-based), as of October 2007, aggregated for PG&E, SCE and SDG&E:

TABLE 6	**Summary of Utility Demand Response Programs**		
Program Type	**Enrolled MW[20]**	**Expected MW[21]**	**No. of Service Accounts Represented by the MWs***
Price-Responsive	1,042.8	438	5,956
Reliability-based	1,762.5	1,649	333,315**

** Based on enrolled values*
***The large number of service accounts is due to the fact that most of the participants are enrolled in A/C cycling-style programs*

The IOU data in Table 6 which shows expected MWs is based upon non-formal compilations made by the CPUC, Energy Division, in the case of PG&E and SDG&E, and from IOU Monthly reports filed with the Commission, in the case of SCE.

MWs of Emergency Triggered DR Currently Available Statewide

As shown in Table 6, the amount of currently-available MWs of expected emergency triggered DR within the aggregated California IOU territories is approximately 1,700 MWs.

[20] Aggregated data provide by the utilities in monthly reports to the CPUC on the operation of interruptible and demand response programs, specifically:
- Report of Pacific Gas and Electric Company (U 39 M) On Interruptible Load and Demand Response Programs for October 2007, dated November 21, 2007, Table I-1
- Report of Southern California Edison Company (U338-3) on Interruptible Load Programs and Demand Response Programs, dated November 21, 2007, Attachment A, Table I-1
- SDG&E October 2007 Report on Interruptible and Outage Programs, dated November 21, 2007, Oct 2007 PUC Rpt.xls, *SDG&E Subscription* worksheet.

[21] Data aggregated from the following sources:
- For SCE: Report of Southern California Edison Company (U338-3) on Interruptible Load Programs and Demand Response Programs, dated November 21, 2007, Attachment A, Table I-1A
- For PG&E and SDG&E: Data on Expected MW values was provided to the CAISO by CPUC Energy Division staff in January 2008.

Comparison of Currently Available with CAISO Recommendation of How Much the State Needs

As indicated above, the overall perspective of the CAISO that a MW range of 500 to 1000 MW, corresponding to a range between 1 and 2 percent of peak system load, is an appropriate quantity of emergency-triggered DR that would be useful to the system during serious system emergencies, to help prevent involuntary firm load shedding. This level is 700 to 1,200 MW less than the currently available amount of expected emergency-triggered DR.

III. CONCLUSION

The CAISO understands that end use customer perception is that reliability-based programs should be infrequently called upon (and considered only as a system safety net), and we are mindful of the effort required to transition these programs. However, the Commission has an opportunity to clarify a policy of transitioning away from counting emergency-triggered DR resources to meet local and system RA requirements, in order to pave the way for the future state of DR which is tightly integrated within wholesale electricity markets and contributes meaningfully to the reliable operation of the grid. Respectfully, we urge the Commission to do so.

Dated: June 25, 2008

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on June 25, 2008. I served, on the Service List for Proceeding R.07-01-041, by electronic mail, a copy of the foregoing Comments of the California Independent System Operator re: ALJ Ruling Requesting Information On Emergency-Triggered Demand Response.

Executed on June 25, 2008 at Folsom, California

/s/ Anna Pascuzzo

Anna Pascuzzo,
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