CALIFORNIA ISO

California Independent
System Operator

October 17, 2001

The Honorable David P. Boergers
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Ensuring Sufficient Capacity Reserves In Today's Energy Markets
Docket No. EX01-1-000

Dear Secretary Boergers:

Pursuant to the Notice Requesting Comments, dated September 27, 2001, please find enclosed for filing an electronic file containing comments by the California Independent System Operator Corporation on the Federal Energy Regulatory Commission Staff Study Team Discussion Paper "Ensuring Sufficient Capacity Reserves in Today's Energy Markets: Should We? And How Do We?" in the above-captioned docket. A Certificate of Service is attached at the end of the electronic filing.

Thank you for your assistance.

Very truly yours,

Margaret A. Rostker
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Operator Corporation

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UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Ensuring Sufficient Capacity Reserves in Today's Energy Markets	**)** **)**	**Docket No. EX01-1-000**

Comments by the California Independent System Operator Corporation on the Federal Energy Regulatory Commission Staff Study Team Discussion Paper "Ensuring Sufficient Capacity Reserves in Today's Energy Markets"

Pursuant to the Federal Energy Regulatory Commission ("Commission") September 27, 2001, Notice Requesting Comments in the above-referenced docket, the California Independent System Operator Corporation ("ISO")[1] hereby respectfully submits comments on the Commission's September 26, 2001 Study Team Discussion Paper, "Ensuring Sufficient Capacity Reserves in Today's Energy Markets: Should We? And How Do We?" ("Discussion Paper").

I. EXECUTIVE SUMMARY

In the following comments, the ISO proposes and discusses the following principles for ensuring sufficient capacity reserves in today's Energy markets:

(a) The responsibility for ensuring adequate capacity, including required reserves, to serve its own peak Load should be placed on the Load Serving Entity ("LSE"), and should be consistent with the terms of reliability of service explicit or implicit in the LSE-customer contract.

(b) To create the right incentives for LSEs to fulfill this responsibility, LSEs that fail to meet their capacity obligations should be subject to deficiency charges that are high

[1] Capitalized terms not otherwise defined herein are used in the sense given in the Master Definitions Supplement, Appendix A to the ISO Tariff.

enough so that the LSE will be better off by complying than by persistently falling short.

(c) To the extent that customers do not have the ability to choose among alternative reliability levels, a regulatory body must establish and enforce standards of service reliability.

(d) To the extent that service curtailments due to capacity shortfalls within a Control Area can not be imposed only on the customers of capacity-deficient LSEs while protecting the customers of capacity-sufficient LSEs, the capacity requirements on individual LSEs must be designed to ensure that system-wide reliability needs are met.

(e) Provision of reserve capacity – the readiness to provide Energy to the power system in accordance with specified performance criteria – is a service for which suppliers must be fairly compensated, even when those suppliers rarely are called upon to actually provide Energy.

(f) The design of competitive electricity markets should assign normal business risks to the entities most capable of managing them, i.e., the wholesale and retail suppliers of electric Energy and capacity.

(g) Capacity obligations and markets should be designed to avoid excessive reliance on spot markets, and should allow LSEs the flexibility to obtain optimal portfolios of resources and forward contracts to meet their needs.

(h) To the extent an ISO or RTO has some responsibility to ensure adequate capacity to meet system balancing needs and reserve requirements, it should not be constrained to relying exclusively on spot markets if contracts would be more efficient.

(i) LSEs should be allowed to use demand-side resources to meet their capacity obligations, but only to the extent that installed technical capabilities enable these resources to be fully effective in performing as required.

II. BACKGROUND

The ISO believes that meeting the challenge of identifying new ways to ensure sufficient capacity reserves is critical to the success of restructured competitive electricity markets in California as well as the rest of the country. Indeed, in an early diagnosis of California's problems beginning in Summer 2000, the ISO identified inadequate generating capacity[2] as a primary factor leading to sustained high prices.[3]

[2] Adequate generating capacity includes both the capacity required to deliver Energy to meet Load and the capacity held operationally available but unloaded to meet reserve requirements. The two are types of capacity are highly interrelated, and therefore most of the discussion in this paper is framed

When reserve capacity margins are thin and system loads are high, the economics of scarcity will drive wholesale prices up to the limits of what consumers are willing to pay even in the absence of market power. However, when there are severe constraints on the ability of consumers to receive timely price information and respond to rising prices, the normal equilibration of supply and demand in a well-functioning market does not occur. As California's experience has shown, under these conditions, tight capacity margins create opportunities for suppliers to exploit market power and raise prices without regard to consumer willingness to pay. In addition, the network aspect of system reliability implies that the failure of just one load-serving entity[4] (LSE) to procure adequate supplies can result in involuntary curtailments throughout the system. This network externality weakens the incentives for LSEs to ensure that they have adequate supply to meet their peak loads. Thus the problem of ensuring capacity adequacy must be addressed and resolved if competitive markets are to be a sustainable structure for the electric industry.

When California's restructured markets were being designed, it was expected that as capacity margins became tight the resulting scarcity prices would provide adequate incentives for investment in new generating capacity. Based on this logic, the traditional "obligation to serve" that had required the investor-owned utilities (IOUs), through a regulated planning process, to ensure adequate capacity was eliminated and

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in terms of the more general supply adequacy problem rather than just the narrow problem of reserve capacity. The distinction is made at certain points in the argument below where relevant.

[3] See, for example, the "Request to Extend Price Caps" by the ISO's Department of Market Analysis, dated August 10, 2000, filed with the Commission on September 14, 2000 as Attachment C to Tariff Amendment 31.

[4] The term "load-serving entity" is used in this paper in a generic sense to refer to any entity that is a retail supplier of electricity to end-use customers, regardless of whether the customer-LSE service relationship is based on a regulatory requirement or a bilateral direct access contract.

replaced by a much weaker obligation on the IOUs and other LSEs to procure adequate energy and reserves through the wholesale markets to serve their retail customers. With this change there was no longer a designated responsibility nor a formal planning process to ensure adequate energy supply or reserve capacity for the California system. It was taken on faith that the market would provide.[5] It is possible that as a result of new generation now coming on-line in California, much of which had already been under development prior to the crisis, the market is providing the needed capacity. It is important to note, however, that most of the new generating capacity arrived after the severe and sustained price shocks had done significant damage. In a market where consumers had the ability to respond to time-varying prices and blackouts could be imposed only on the customers of capacity-deficient LSEs, a period of sustained high scarcity prices might have led to efficient market outcomes with less disruption. In California it was disastrous. The lesson learned is that policy makers and designers of electricity markets must ensure that market incentives and designated roles and responsibilities combine to provide adequate energy supply and reserve capacity for the system. In particular, given the lead times needed to plan and complete generation projects, policies must help establish stable long-term revenue expectations to bring new capacity on-line in time to avert a crisis, not after it has occurred.

Taking the above observations as a starting point, in the following sections the ISO examines the issue of capacity adequacy in greater detail and offers comments on

[5] The same act of faith was made with regard to transmission upgrades as well, based on a tenuous distinction between "reliability upgrades" and "economic upgrades." Analogous to the case of generation reserve capacity, the problem of network externalities inherent in transmission upgrades and the fact that expanding a transmission path tends to eliminate congestion revenues on the path led to very weak incentives for market participants to build the transmission infrastructure needed to facilitate workably competitive wholesale power markets.

the mechanisms explored in the Commission's Discussion Paper. Then in the closing section the ISO offers certain conclusions.

III. DISCUSSION

A. The Problem

The ISO agrees with the Commission Study Team's assessment of the problem of reserve capacity and the current state of affairs in restructured electricity markets. Specifically, the ISO notes the following key points:

1. Real-time price responsiveness of customers is extremely limited, although in time it could be enhanced through a combination of new metering technologies and appropriate rate designs.[6] The present circumstances undermine the consumer's ability to say no to high prices, thus allowing the exercise of market power by suppliers when capacity margins are tight.
2. Involuntary curtailments in real time can not be targeted specifically to customers of LSEs who have not procured adequate reserve capacity, although this situation could also be remedied in time through technological means and appropriate policies. Under the present circumstances this limitation creates an externality problem that undermines the incentives for all LSEs to procure adequate capacity to meet their peak loads.
3. Under a competitive wholesale market framework, decisions to invest in new generation are up to the individual market participants. There is no entity, regulatory or otherwise, to ensure that reserve capacity is adequate on a system-wide basis. This means that new generation investment decisions will be made to maximize the profits of individual suppliers, not to ensure adequate capacity on a system basis. At the same time, the control area operator is responsible for the reliable operation of the system in real time, and to do this the operator needs adequate reserve capacity.

[6] On this subject it is important to realize that the way commercial and industrial enterprises organize their activities may prevent most of them from being very price responsive in real time, hence they may tend to prefer flatter rate profiles. Nevertheless it is extremely important to meter their usage on the basis of an hourly or smaller interval, as this is a necessary condition for efficient allocation of spot price risk between customers and LSEs. Customers who want flat monthly rates, for example, may negotiate these with their LSE and pay a risk premium for this smoothing based on their actual consumption profile. This type of arrangement then provides the LSE with both the financial incentive and the forecasting capability to plan and procure its capacity needs.

California's experience has shown that the points enumerated above present real impediments to a pure market approach to capacity adequacy. For example, the factors of point 3 present the system operator with an irresolvable dilemma. Specifically, when the conditions of points 1 and 2 prevail and there is high system load and scarce supply, possibly exacerbated by the exercise of market power, the system operator is faced with two options both of which are problematic. Either it fulfills its mandate to maintain reliability by procuring real-time energy at exorbitant prices, and then faces criticism for maintaining "reliability at any cost," or it acts as a proxy for consumer price responsiveness by setting a price at which it stops buying real-time energy and initiates blackouts, and then faces criticism for failing to maintain reliable operation. While there may be some policy options for how to relieve the system operator of this burden, a root cause of the problem is the absence of any designated responsibility or reliable incentive structure to ensure capacity adequacy.

Finally, it is important to note that points 1 and 2 above are current problems which may be resolved in the future through appropriate public policies and applications of technology. In contrast, point 3 expresses a fundamental design issue in electric industry restructuring which needs to be addressed even when points 1 and 2 are no longer problematic. Therefore, in considering the options for addressing the reserve capacity question, the ISO's comments that follow start at the level of fundamental design with a discussion of roles and responsibilities in the restructured industry, and then address the special considerations driven by the kinds of temporary limitations that prevail in California today.

B. Guiding Principles

The central commercial relationship which drives all other relationships in the electric industry is between the end-use customer and the retail supplier or load-serving entity (LSE). The end-use customer wishes to consume electricity to power a household, a business enterprise, or a public service, and the LSE – which may be a vertically integrated utility, an unbundled distribution company, or a competitive retailer – is in the business of supplying electricity to end-users. The ISO believes that the answer to the question of capacity adequacy begins with an examination of the nature of the customer-LSE relationship. Consider the following paradigms for framing the customer-LSE relationship and the responsibility for capacity adequacy.

1. At one end of the spectrum is the traditional vertically integrated utility, which has a traditional "obligation to serve" all consumers within its service territory. Although certain customers may elect an interruptible service tariff, for the most part reliability is a property of the whole control area rather than a service option that customers may select. Under this paradigm, most customers do not have choice of supplier or reliability level, and involuntary curtailments are not directed to specific customers. The traditional obligation to serve therefore entails a responsibility on the LSE to ensure adequate generation capacity to serve load at a rigorous standard of reliability.
2. At the other end of the spectrum, consider an industry structure in which regulatory policy and technology combine to allow all customers to choose their LSE and their desired level of reliability.[7] Each LSE may make its own business decisions about how much capacity to procure, and in the event of a real-time shortfall involuntary curtailments will be directed only to the customers of those LSEs who have not procured adequate capacity. LSEs may then compete for customers on the basis of reliability-price tradeoff, offering lower-priced service to those customers willing to

[7] Under this paradigm there would need to be some provision, probably through the regulatory process, for those "default" customers who can not or do not wish to choose among alternative LSEs and reliability levels and therefore would receive a regulated level of reliability. This is especially true due to the fact that electricity is a necessity of life and, due to its complexity, the requirement to choose among alternative reliability levels could impose an unreasonable burden on a majority of small customers. Such customers would include, for example, low income and special needs customers and would probably extent to essential services as well, all of which may be provided for through a variety of approaches. Since this is not the subject of the present comment, the discussion of customer choice herein makes the simplifying assumption that all customers participate in choice.

accept lower reliability. Under this paradigm, adequate capacity is purely a matter between LSEs and their customers, since curtailments under shortage conditions will apply only to customers who have voluntarily chosen less reliable service, thus eliminating the externality effect of inadequate capacity.

Obviously the industry of today is somewhere between these two extremes, and will probably remain so for the foreseeable future. Indeed, while today's interruptible tariffs fit squarely into paradigm 2, the idea of extending paradigm 2 to the entire market may or may not be a feasible way to operate an electricity system nor a desirable end state for a restructured electric industry. The above dichotomy is helpful for thinking about the issues, however, because it does point towards a few principles that help guide the resolution of the capacity adequacy problem:

(a) The responsibility for ensuring adequate capacity, including required reserves, to serve its own peak load should be placed on the LSE, and should be consistent with the terms of reliability of service explicit or implicit in the LSE-customer contract.[8]

(b) To create the right incentives for LSEs to fulfill this responsibility, LSEs that fail to meet their capacity obligations should be subject to deficiency charges that are high enough so that the LSE will be better off by complying than by persistently falling short (within a reasonable allowable margin, as discussed below in connection with the role of the system operator).

(c) To the extent that customers do not have the ability to choose among alternative reliability levels, a regulatory body must establish and enforce standards of service reliability.

(d) To the extent that service curtailments due to capacity shortfalls within a control area can not be imposed only on the customers of capacity-deficient LSEs while protecting the customers of capacity-sufficient LSEs, the capacity requirements on individual LSEs must be designed to ensure that system-wide reliability needs are met.

In addition to getting the customer-LSE relationship right, an effective solution to the capacity problem must also ensure that returns to suppliers of reserve capacity are adequate to elicit an efficient level of supply response from the market. At the most general level this feature may be captured in an additional principle:

(e) Provision of reserve capacity – i.e., the readiness to provide energy to the power system in accordance with specified performance criteria – is a service for which

[8] Analyses of California's experience indicates that a system capacity margin that merely satisfies load and reserve requirements (roughly ten percent above system load) is not adequate to mitigate market power in general. Rather, it takes roughly a 20 percent margin above system load to restrain prices to competitive levels through competitive forces. Therefore, in designing details of a capacity obligation it is important to assess the potential for and impact of market power during peak load hours under various levels of capacity margin.

suppliers must be fairly compensated, even when those suppliers are rarely called upon to actually provide energy.

Finally there is one additional principle which is relevant to this discussion, although it is more general and broad in scope than the immediate subject at hand.

(f) The design of competitive electricity markets should assign normal business risks to the entities most capable of managing them, i.e., the wholesale and retail suppliers of electric energy and capacity. Because the electric industry has large inherent externalities, at the broader economic and social level as well as via the physical network, there are legitimate instances where spreading risks leads to greater societal efficiency. In general, however, for competitive market structures to succeed there must be a positive relationship between risk and expected profit. While there will be areas where overall system costs can be reduced by socializing some risks across the market, the opposite can occur if socialization of business risks creates uneconomic externalities, which can protect the less efficient and competent firms while allowing the more efficient and competent firms to earn excess profits. Therefore, although policy makers and market designers have a responsibility to provide a reasonably stable investment environment, the market participants should be responsible to negotiate contracts between themselves that provide their desired allocation of risk, and exceptions to this principle must be crafter with care.

C. Identified Mechanisms for Ensuring Adequate Capacity Reserves

(1) Capacity obligations for energy and reserve capacity, versus capacity obligations for reserves only; forward contracts versus spot markets for capacity.

Based on the principles articulated above, the ISO believes that capacity obligations should cover both the energy and the reserve requirements entailed by the volume and nature of retail load an individual LSE is contracted or required by regulation to serve. This being said, we offer several observations.

- With reference again to the ISO's early diagnoses of the events of Summer 2000 in California, we recognized that the California market was excessively dependent on spot transactions (day ahead up to real time) rather than forward contracts of varying lengths. Capacity markets are in this way no different from energy markets. To the extent that buyers rely on spot transactions they will be subject to market power, and suppliers will have incentives to organize their supply response (including investment in new capacity) to take optimal advantage of high and volatile spot prices. Indeed, the problem of market power identified in the Commission's Discussion Paper is rooted primarily in excessive reliance on spot transactions. The

ISO believes that the supply of capacity, both for energy and reserves, should rely on spot markets for no more than roughly 10 percent of the needs of any given LSE.

- Firm energy contracts and call-option contracts are complements, not mutually-exclusive alternatives. LSEs organizing the supplies needed to meet their loads will optimally rely on a combination of both types of contracts, of various forward terms.
- To the extent an ISO or RTO is the designated agent to procure reserve capacity (as well as the balancing energy needed to serve load), this role should be structured to stay within the 10 percent guideline. Even so, there is no reason why an ISO or RTO could not procure reserve capacity or balancing energy through call-option contracts rather than exclusively through spot markets.
- Developing a market system that relies on forward contracts for its energy and reserve capacity needs also effectively addresses the concerns of investors regarding a stable and predictable revenue stream. While some uncertainties will always remain to the extent returns are tied to spot prices, a proper balance of forward and spot transactions will keep these risks to a level that is manageable by competent firms and acceptable to the capital markets.
- The effective solution to the LSEs' problem of accurate load forecasting is for the LSE to negotiate a portfolio of contracts of various types and forward terms, to be supplemented by the 10-percent-maximum role for the system operator. The ISO does not believe that load forecasting error is valid justification for the system operator to assume the role of obtaining reserve capacity for the market as a whole. If the electric industry is to evolve towards a sustainable competitive model, wholesale and retail intermediaries should be prepared to assume normal business risks such as forecasting their supply needs and should have the capabilities to manage such risks profitably. The ISO believes that this is a fundamental principle of competitive restructuring which should be incorporated in market design for the industry, namely, to allocate normal business risks to those entities best suited to manage them, the profit-making firms in the electricity supply business.

(2) ***Demand-side and conservation mechanisms.***

The ISO believes that demand-side and conservation mechanisms must and will play a vital role in a stable and sustainable industry structure. There is much work to be done, however, before that role can attain significant magnitude relative to the overall needs of the system for energy supply and reserve capacity. Since early in its existence the ISO has been actively developing mechanisms for loads to participate in its markets, and is committed to work to expand their participation. However, it is important to be realistic about the technical and policy requirements for effective demand-side

participation in supplying capacity, and to allow LSEs to use demand response to meet their capacity obligations only to the extent that installed technical capabilities enable these resources to be fully effective in performing as required. The ISO thus agrees with the Discussion Paper's assessment of the benefits of demand-side mechanisms, and with its observation that further advances in public policy and the application of certain technologies are still needed.

(3) ***The role of customer choice.***

As noted in the Discussion Paper, it may be technologically feasible for system curtailments to be imposed only on the customers of capacity-deficient LSEs. It is not yet a functional reality at present, however. Similarly, in a more robust customer-choice market it may be desirable and feasible for LSEs to compete based on levels of reliability of service, so that customers could choose lower-reliability LSEs and pay a lower price if such service met their needs. Again, this is not a functional reality yet either. The ISO believes, however, that these scenarios are not far-fetched views of future possibilities and should therefore be entertained as policy makers and market designers think about the capacity adequacy problem. In particular, thinking about the problem this way brings into focus the system externalities inherent in today's management of reliability and the policy constraints that limit our options for the time being. The important point to bear in mind in designing capacity obligations for the industry as it is today is to try to limit the role of the "market as a whole" (through the regulator and the system operator) to managing only those externalities than can not efficiently be internalized in the transactions of the market participants.

IV. CONCLUSION

The ISO appreciates the opportunity to comment to the Commission on this extremely important topic. As discussed above, the ISO believes that the best way to resolve the problem of supply adequacy is through proper specification of the roles and responsibilities of LSEs, and that the role of the system operator in supplying reserve capacity as well as balancing energy should be held, by market design and incentive structures, to no more than 10 percent of total system requirements. Even so, the system operator should not be constrained to using spot markets to meet this final 10 percent if contracts would be more efficient. And indeed, heavy reliance by LSEs on spot markets for reserve capacity will exacerbate market power problems just as it does in energy markets. The obligation on LSEs should be defined to cover both energy supply and unloaded reserve capacity, and should be allowed to include demand-side resources to the extent installed technical capabilities allow these resources to be fully effective in performing as required.

Respectfully submitted,

Margaret A. Rostker
The California Independent System
Operator Corporation

CERTIFICATE OF SERVICE

I hereby certify that I have this day electronically served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Folsom, CA, this 17th day of October, 2001.

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Margaret A. Rostker