Rulemaking	12-03-014
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Witness:	Neil Millar

Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans.	Rulemaking 12-03-014

REPLY TESTIMONY OF NEIL MILLAR ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Integrate and Refine Procurement Policies and Consider Long-Term Procurement Plans.	Rulemaking 12-03-014

REPLY TESTIMONY OF NEIL MILLAR ON BEHALF OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

Q. What is your name and by whom are you employed?

A. My name is Neil Millar. I am employed by the California Independent System Operator Corporation (ISO), 250 Outcropping Way, Folsom, California as the Executive Director, Infrastructure Development.

Q. Please briefly describe your employment and educational background.

A. I received a Bachelor of Science in Electrical Engineering degree at the University of Saskatchewan, Canada, and am a registered professional engineer in the province of Alberta.

I have been employed for over 28 years in the electricity industry, primarily with a major Canadian investor-owned utility, TransAlta Utilities, and with the Alberta Electric System Operator and its predecessor organizations. Within those organizations, I have held management and executive roles responsible for preparing, overseeing and providing testimony for numerous transmission planning and regulatory tariff applications. I have appeared before the Alberta Energy and Utilities Board, the Alberta Utilities Commission, and the British Columbia Utilities Commission. Since November, 2010, I have been employed at the ISO, leading the Transmission Planning and Grid Asset departments.

Q. What is the purpose of your reply testimony?

A. I will address the fundamental issue of whether the ISO's planning assumptions are overly conservative, and whether it is reasonable for the Commission to use the OTC study results as a basis for authorizing procurement in the LA Basin and Big Creek/Ventura areas. Specifically, my testimony will provide details about the appropriateness of the ISO's study methodology for determining local capacity requirements (LCR) and the load forecast and levels of demand response, energy efficiency, combined heat and power and energy storage modeled in the ISO's once through cooling (OTC) study. Mr. Sparks provided some information about these assumptions in his supplemental testimony, submitted in this docket on June 19, 2012. I am adopting that portion of his supplemental testimony, pages 4-7, as part of this reply testimony. Finally, I will respond to criticism that the ISO is not supporting state renewable energy policy goals.

<u>Transmission Planning for Local Area Needs</u>

Q. Several parties to this proceeding, including CEJA witness May and DRA witness Fagan, have questioned the fundamental principles of the ISO's local capacity study methodology, the use of power flow tools for analyzing local needs and the planning standards and assumptions used by the ISO. Can you address these arguments and concerns?

A. Yes, I can. The following sections of my testimony will describe the basic elements of local capacity studies and the studies the ISO conducts for the purposes of its annual transmission planning process. I will also describe the differences between these studies and the studies being conducted by Mr. Rothleder for system procurement purposes.

Q. Please describe how the ISO conducts a local capacity technical study.

A. As Mr. Sparks set out in his testimony, local capacity technical studies are reliability assessments conducted to identify areas within the ISO controlled grid that have local reliability needs and to determine the minimum generation capacity that would be required to satisfy these local reliability requirements.

Further, they are conducted applying a detailed methodology set out in the ISO's tariff and Business Practice Manual for Reliability Requirements. Each year, before the commencement of the study work, a detailed Local Capacity Requirements Manual is prepared to address the specifics of the study year being examined. (see ISO Ex. 18)

The study itself consists of modeling the power system and simulating contingencies in both steady-state powerflow and dynamic stability analysis to identify areas within the ISO controlled grid that have local reliability needs and to determine the minimum generation capacity that would be required to satisfy these local reliability requirements. A copy of the 2013 Local Capacity Technical Study has been provided as ISO Ex. 14, and is discussed in Mr. Sparks' reply testimony in more detail.

The contingencies and required system performance levels that are applied are based on the NERC transmission planning reliability criteria, as augmented by WECC regional standards and California-specific standards. These mandatory standards are deterministic. Assumptions are made regarding load levels and system conditions prior to a disturbance and then specific disturbances are simulated to test modeled performance against performance requirement scales. In general, a broader range of system impacts are permissible for more extreme, and less likely, types of contingencies.

The deterministic test is exactly that – a test. It is not an assessment of every possible operating condition and the anticipated system response to each possible operating condition. This is an important distinction, as the probabilistic methodologies that are more common in system-wide resource adequacy analysis, but the two types of analyses have fundamental differences for which the lines must not be blurred.

Q. What is the difference between a deterministic study and a probabilistic analysis?

A. A deterministic transmission planning study, used by the ISO for the OTC/LCR studies and all of its transmission planning studies, makes a number of idealized assumptions, and then tests the system performance following simulated contingencies, whether in the steady-state power flow analysis or dynamic stability analysis. The required performance for each level of contingency is established through years of industry-wide experience and stakeholder input, resulting in a testing methodology that has been adopted by NERC and FERC and provides consistent and acceptable system performance across the United States, Canada, and the interconnected portions of Mexico. Those performance levels differ for different broad categories of contingencies, recognizing the significantly different likelihood of occurrence for those categories of contingencies.

Probabilistic analysis, in contrast, sums the probabilities of a number of events, each with its own probability of occurring, occurring at a particular time or in combination and assesses the anticipated impacts of all of the potential events. System-wide resource adequacy analysis lends itself to this type of approach. Individual generators each have their unique performance characteristics, including the probability of forced outages, and the combined effect of the individual performance characteristics can be considered on a probabilistic basis.

Studying a transmission system on a probabilistic basis has not replaced deterministic assessments for a number of reasons. These include the complexity of needing to consider the individual performance of a significantly larger number of transmission and generation components, considering the interaction on the transmission system between those components, and also the wide range of operating conditions that could exist at any point in time. Also, and to some extent because of these complexities, there is no meaningful industry standard to compare forecast performance against, unlike the deterministic criteria adopted by NERC and WECC. Probabilistic techniques are emerging that can be applied to transmission system planning working in conjunction with deterministic analysis. To this point, these techniques have been utilized more frequently to assist in the selection of the optional alternative to address a reliability issue, or to consider the merits of transmission reinforcement to address economic or policy-related issues. However, haphazardly or selectively applying probabilities of a particular event occurring in the midst of a deterministic analysis is not a probabilistic analysis – it is neither. Arbitrary adjustments to exclude certain contingencies from analysis as suggested in the referenced testimony simply result in weakening and undermining the test being applied in the deterministic analysis.

Applying probabilities selectively to weaken the deterministic test would be analogous to a medical student seeking to have his or her grades improved, by pointing out that the likelihood of being confronted with a particular disease or condition that was the subject of a test question is quite low, and therefore should be removed from the grading. It defeats the entire purpose of testing the integrity of the transmission system through a deterministic analysis, yet fails to provide the comprehensive view of risk under a wide range of operating conditions that probabilistic analysis would provide.

Q. Has the Commission addressed the ISO's LCR study methodology?

A. Yes. The Commission made determinations in D.06-06-064 regarding the criteria and test contingencies. Furthermore, the Commission approves the ISO's annual LCR study each year for purposes of resource adequacy. Mr. Sparks addresses specific issues regarding the LCR study methodology in his reply testimony.

Q. Do the OTC/local capacity studies differ from other transmission planning studies that the ISO conducts as part of its annual transmission planning process?

A. Transmission planning studies include a range of analysis, and different input assumptions are used for the different types of analysis such as local area studies. In studying local capacity needs whether in the annual local capacity studies, OTC studies, or the ISO's annual transmission planning process, a one-in-ten load forecast is employed for a number of reasons as set out below. Regional studies on the bulk transmission system are more generally conducted using a one-in-five load forecast, recognizing that there is a higher probability of load diversity over a larger area; simultaneous coincident peak loads in most or all areas within the ISO footprint are unlikely. In studying potential economic-driven transmission projects, the ISO uses a one-in-two load forecast, to provide a more modest estimate of economic benefits associated with a potential transmission upgrade.

In assessing reliability needs, the relevant NERC planning requirements call upon the system to be planned "at all demand levels over the range of forecast system demands" [NERC Standard TPL-002; ISO Ex. 13]. As explained earlier, the tests applied to examine system performance test the boundary conditions under certain assumptions, not only including highest anticipated load levels, but also idealized conditions with the rest of the system in service.

Local capacity analysis utilizes the most conservative set of assumptions, including the highest level of conservatism in the load forecast studied, as there is less opportunity for load diversity and generally fewer operational options in a smaller local area to manage shortages. As these load pockets or local capacity areas tend to be urban areas of high population density (which makes additional transmission into the areas challenging, prohibitively expensive or altogether not viable) there is also less tolerance for outages on an unplanned or rotating outage basis. These local areas contain approximately half of the total load of the ISO controlled grid, and are particularly sensitive to electricity outages.

The local capacity technical study methodology that was used in the OTC analysis followed this traditional approach used in transmission planning studies. As Mr. Sparks explains in more detail in his reply testimony, there are subtle adjustments to the specific contingency analysis embedded in the ISO tariff for determining local capacity requirements from the more complete analysis performed in annual transmission planning studies, such as excluding certain types of contingencies from testing and clarifying the acceptable level of system performance for certain Category D outages for LCR purposes.

Q. How do the ISO's local area capacity studies compare to the system studies that are being conducted by Mr. Rothleder for the purposes of determining incremental needs for new resources?

A. As I explained earlier, the local capacity studies focus on the need to provide an adequate transmission system that will be capable of being operated on a day to day basis providing acceptable levels of reliability of supply, augmented with local generation capacity as necessary.

Mr. Rothleder's analysis focuses on the overall system requirements to maintain the load and generation balance across the entire ISO balancing authority area, recognizing the increased variability that dispatchable generation resources will need to manage as additional non-dispatchable variable renewable resources are added to the grid. In performing this analysis, he considers relatively few transmission limitations in adjusting resources to match changing load and non-dispatchable generation levels, and considered lower system-wide load assumptions recognizing the effects of diversity across the system and the broader range of options available to address shortfalls than exist in local capacity areas. This difference in study approach is entirely appropriate, and the methodology and assumptions are tailored to the purpose of the study.

Q. How does the ISO use the Commission's planning assumptions in its transmission planning studies?

A. The ISO relies upon the renewable generation portfolios developed by the Commission, working with the ISO and the CEC, for the development of policy-driven transmission plans necessary to enable the state to meet its 33% RPS objectives. As I discuss above, the ISO's planning requirements regarding reliability requirements are based on its FERC-approved tariff and the NERC reliability standards and WECC regional criteria.

Q. CEJA witness Julia May, in her testimony at pages 36-43, argues that the ISO's LCR study methodology uses "extreme" reliability criteria beyond NERC/WECC standards that favors over-procurement of fossil fuel generation. How do you respond to these assertions?

A. These assertions are simply not correct. As indicated earlier, the ISO employs the NERC and WECC standards in its planning activities. Much of the criticism appears to be drawn from three issues that I will address in turn.

First, on page 39 of Ms. May's testimony, Ms. May quotes Ms. Firooz: " in my experience long term **resource planning** was done using a one-year-in-two (expected) load forecast plus 10% adder to provide an installed capacity cushion to account for unexpected generator outages and load forecast error at time of peak. Later, the cushion was raised to 15% to 17%." [Emphasis added]
These comments are not applicable to the studies under consideration. Local reliability analysis and the application of WECC and NERC planning standards are not system-wide resource planning exercises. To the contrary, transmission planning standards set the requirements for a reliable transmission system to deliver electricity from generation to loads, with local capacity requirements being determined necessary when the transmission system cannot be reasonably reinforced to serve the local load solely from system-wide generating resources.

Secondly, Ms. Firooz is quoted on page 38 as calculating the probabilities of particular multiple contingency events such as an "N-1-1" contingency, presumably to argue that considering these contingencies is unreasonable. However, as I explained earlier, the deterministic analysis assumes other idealized system conditions, and watering down the deterministic criteria through haphazard application of probabilities misses the point of deterministic planning studies, and the application of deterministic standards entirely.

Thirdly, Ms. May quotes a number of sources regarding the potential to drop load in lieu of system reinforcements for category C and other more extreme contingencies. I note that the actual quote [NERC Standard TPL-003] applicable to category C contingencies including the N-1-1 contingency referred to earlier is:

> "Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding) the planned removal from service of certain generators, and/or the curtailment of contracted Firm (non-recallable reserved) electric power transfers **may be necessary** to maintain the overall reliability of the interconnected transmission systems." [emphasis added]

This is permissive under qualified conditions – not an expectation that if one is not relying on load shedding, that one is automatically exceeding the minimum standards.

Mr. Sparks' testimony addresses the specific assertions regarding the ISO's development of transmission reinforcements to eliminate or reduce the local capacity needs in these and other local capacity areas; I will not address those issues in my testimony as well.

Q. At pages 37-38 of CEJA witness May's testimony, citing testimony presented by CEJA in A.11-05-023, she notes that load drop is available as a "safety net" and that it is "more reliable than a generating unit." What is the ISO's position on controlled load shedding as a mitigation solution in local areas where resource deficiencies have been identified?

A. Controlled load shedding can be an acceptable mitigation for Category C outages subject to careful review of the specifics of the situation. In general, the amount and particular sensitivity of the load, the type of reliability issue being addressed, and possible restoration considerations must be considered, as well as the reliability and complexity of the means by which the load would be shed. If the load shedding is to occur under a special protection system, then the special protection system must be considered to ensure that it does not compromise system reliability

To provide more transparency to industry, guidance to transmission planners, and consistency across the ISO controlled grid, guidelines have been developed by the ISO and documented in the California ISO Planning Standards [June 23, 2011] (see ISO Ex. 19), setting out the considerations that must be given on a case by case basis. These planning standards are attached to my testimony as Exhibit 3. These include, among other considerations, the number of potential contingencies that would cause the SPS to operate, the number of elements that need to be monitored, and the consequences if the SPS failed to operate properly.

<u>Planning for Incremental Demand Response, Uncommitted Energy Efficiency, Uncommitted Combined Heat and Power, and Energy Storage</u>

Q. DRA witness Kevin Woodruff at page 9 of his testimony, other parties, and interveners have expressed concern that the levels of incremental demand response (DR), uncommitted energy efficiency (EE), uncommitted combined heat and power (CHP) and energy storage assumed in the ISO's OTC study do not comply with the state's energy policy goals. Do you agree?

A. No, I don't. The ISO fully supports these energy policy goals and the loading order and has been working diligently with state agencies to ensure that those goals are met while maintaining system reliability. I would note that the state goals include maintaining a reliable electricity system.

As I will explain below, the ISO's objectives in ensuring adequate system reliability, including reliability within local capacity-constrained areas that constitute a significant portion of the ISO controlled grid, is not inconsistent with the state's energy policy goals. Nothing in these reliability requirements precludes advancement of the state goals.

Q. Do you believe that the state's goals for these preferred resources will be thwarted if the ISO does not modify its planning assumptions to recognize more aggressive development forecasts?

A. No, not at all. I will comment on each of these issues in turn.

Demand Response: The ISO agrees that demand response can be a valuable asset, with its usefulness in addressing different needs being largely driven by the characteristics of the demand response program itself. The characteristics of a particular program may not lend itself to addressing all possible needs on a transmission system. However, that does not reduce the benefit for the needs that the particular program does meet. In particular, the most demanding requirements would be to address specific contingency-driven needs in a local capacity area – where the exact timing of response, amount of response, and assurance of response have the tightest specifications and the least margin for variance. In contrast, demand response programs assisting with broad system adequacy issues have the most latitude regarding responsiveness while still providing value to customers.

Energy Efficiency and (behind the meter) Combined Heat and Power: These programs again provide broad system benefits. They can also provide local capacity requirements to the extent they can be reliably forecast and included in demand forecasts on a timely basis. Even if they cannot be reliably forecast to incorporate reliability benefits in local capacity areas on a timely basis, they provide the energy savings necessary to offset other forms of generation in both the local area and on a system basis.

Combined Heat and Power (sales to grid): These assets are treated as resources, rather than being incorporated into demand forecasts. To the extent these generators can provide the performance necessary in the local capacity areas, these generators can compete with other generation to provide local capacity needs.

Distributed Generation: As set out in the supplemental testimony of Mr. Sparks that I adopted, the ISO analysis includes a reasonable level of distributed generation for the purposes of the reliability assessment. Increased levels of DG will continue to benefit both system needs as well as reducing the potential need to operate other generation in the local capacity areas.

In short, ensuring adequate local capacity to address the uncertainty of the location, timing and impact of these programs does not impede their development, and, through the assurance of reliable system operation, enables the state to more confidently move forward to encourage these programs.

Q. Why didn't the ISO model demand response?

A. The ISO does not agree that Demand Response can be relied upon to address local capacity needs, unless the DR can provide equivalent characteristics and response to that of a dispatchable generator. Demand Response programs have generally been considered an alternative to generation resources in meeting system-wide load and supply balances. Spread over a larger system, the exact amount of DR that materializes, and the location, is not relevant (within certain bounds). However, to ensure that DR does not materialize in an area that compounds a system problem (and in particular, a system problem that drove the need for reliance on DR), the ISO strongly supports DR being location-based and dispatchable – in the past, the ISO has referred to this as "generation substitutable". Further, if it is being relied upon instead of construction of new generating plants, the DR programs must be dependable over a significant period of time equivalent to the service that would be provided by new generation resources – which the ISO has referred to in the past as "durable."[1] However, these characteristics at a broad system-wide level are not sufficient to enable inclusion of the resources to address local capacity requirements triggered by transmission-related contingencies. The system must be positioned to withstand any single contingency. Typically, following a contingency event, the ISO is faced with restoring the system to a state positioned for the next, worst

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[1] The ISO recently discussed the importance of durability in comments submitted in CPUC Proceeding A.11-03-001. *See* Comments of the California Independent System Operator Corporation on the Alternate Proposed Decision Adopting Demand Response Activities and Budgets for 2012 through 2014, at 7-8 (April 9, 2012) (ISO Ex. 20).

contingency within 30 minutes. These types of requirements are location specific and time specific. Unlike the system needs (where DR resources are helpful as part of a range of mitigations even without certainty about the resource characteristics and it is sufficient to simply avoid DR resources that could compound a problem), addressing local capacity requirement issues that are contingency-driven requires prompt and dependable response – operators simply cannot wait to see what materializes, and still have time to respond to address a shortfall.

In the past, and in unique circumstances, the ISO has counted on a small amount of large DR programs; these exceptions should not be taken to be the rule.

Q. Enernoc witnesses Hoffman and Tierny-Lloyd submitted testimony addressing DR programs in other ISO/RTO regions as well as other parts of the world. Does this information provide a reasonable basis for the inclusion of incremental demand response in the ISO's local capacity studies?

A. No. The ISO has reviewed the characteristics of the various demand response programs in place within the ISO controlled grid, in the course of preparing for the anticipated summer season without SONGS. The ISO has not been able to identify a material amount of demand response that has the characteristics to address contingency-driven local capacity requirements, in keeping with the characteristics I set out above. While this does not negate the value of demand response programs in addressing other system-wide operational needs, it also does not encourage further reliance on programs that have not yet produced material amounts that address the specific needs in the local capacity areas.

The ISO will continue to work with the Commission on demand response, as well as participating with the various related FERC dockets. The possibility of demand response programs in other jurisdictions that may have the characteristics necessary to address local capacity needs is encouraging, but it is premature to assume that

that these types of resources will become available for reliability purposes. There is simply no evidence in the California experience to support assumptions that material levels will emerge with the necessary characteristics.

Q. **DRA, NRDC and other interveners have presented materials and reports about forecasted levels of EE much higher than those used in the OTC study. Would this information support changes to the EE levels embedded in theCEC forecast?**

A. As I explained earlier, the ISO is required to consider the entire range of load forecast possibilities in its deterministic reliability assessments. The base forecast adopted by the CEC included various ranges of impacts within the forecast period of all existing programs. The CEC further recognized that there was considerable uncertainty as to the timing, location, and impact of the uncommitted programs – these are the very parameters that make it difficult to further adjust the load forecast downward in local capacity areas with specific needs in specific time frames. Given the inherent risks in adjusting a comprehensive load forecast on a piecemeal basis, I do not see sufficient reason to shift from the adopted forecast. Further, the ISO has provided some accommodation for uncertainty in future adjustments to the load forecast by requesting that procurement of local capacity needs at this time be based on the lower end of the identified ranges, assuming that resources will be procured at the most effective locations in each area.

Q: **Clean Coalition witness Janice Lin recommends, among other things, that the Commission should adopt a multi-year procurement mechanism that includes energy storage. What is your response to these comments and the other witnesses addressing energy storage?**

A. Having reviewed the testimony of Ms. Lin, I am not sure if there is an area of disagreement. Storage resources should not be excluded from resource procurement providing that they can deliver the necessary characteristics for local capacity. However, and I have not seen this suggested, it would be a different issue if delays in procurement are being sought in the hope that technological advances may occur such that storage can provide the necessary characteristics in the future. The ISO would strongly discourage this approach, as a reasonable level of procurement must commence now, in our view, to ensure reliable service in the future.

Q. California Cogeneration Council witness Beach, on page 11 of his testimony, recommends that the ISO should join the other agencies in encouraging CHP. Has Mr. Beach correctly stated the ISO's position with respect to CHP?

A. No, I do not agree with Mr. Beach's representations that the ISO is not encouraging CHP. The base forecast provided by the CEC included a reasonable amount of "behind the meter" CHP. Further, the ISO assumed that the amount of CHP currently in place would remain; that new resources would appear to replace retiring resources and that existing resources with contracts nearing termination would remain in place. Further, I note that we have set out in this proceeding the ideal characteristics of the generation we believe should be procured to maintain reliable service in the local capacity areas. I anticipate that additional CHP will compete in the procurement processes. So, with the opportunity to participate in procurement processes for the generation that we are recommending be procured, and the modeling of a reasonable set of assumptions recognizing the uncertainties identified in the CEC forecast at the time the forecast was prepared, there is ample opportunity for CHP to develop.

<u>OTC Compliance Dates (DRA- SIAO testimony)</u>

Q. The testimony presented by DRA witness Siao and incorporated into witness Fagan's load and resource table set forth on pages 18-19 suggests that compliance dates for the generators affected by OTC requirements may vary

greatly and that some plants may continue to operate beyond compliance dates. Do you believe that this information should be incorporated into the ISO's OTC studies?

A. The ISO is committed to working with the state agencies and the industry to achieve state policy goals, and to ensure that reliability is maintained through the transitions taking place to meet those goals. This commitment to policy goals is not exclusive to renewable energy, but also to the goals regarding reducing impacts on coastal marine life of OTC coastal generation. Making decisions now assuming those goals will not be achieved in effect ensures that that the goals will not be met. For this reason, this is not a tenable position and should not be taken into account by the Commission without considerable supporting evidence that the goals will in fact not be met.

<u>Procurement Characteristics for Non-Generation Alternatives</u>

Q. The July 13, 2012 Assigned Commissioner Ruling asked the parties to this proceeding to comment on non-generation resource characteristics required to ensure that incremental resources can compete in the procurement process to fill local capacity deficiencies. What are the ISO's recommendations in this regard?

A. Given the importance of having resources available in local areas to reliably operate the system and serve load under stressed conditions, resources participating in an RFO must have a high net qualifying capacity commitment. In addition, as I explain earlier in this testimony, resources must be substitutable for conventional (thermal) generation and must be location specific. Such resources should be able to respond to dispatch instructions and should have sufficient durability to remain in service over the needed period of operation. Finally, to successfully bid into the procurement process, these resources must be capable of reacting in the time frames necessary to address transmission system issues. Relying on resources without these characteristics to meet local needs under stressed system conditions will leave operators with few options to meet reliability standards.

<u>ISO Recommendations</u>

Q. TURN witness Woodruff and other intervener witnesses have taken issue with the ISO's cautionary statements, in Mr. Spark's supplemental testimony, that the risks of under-procurement are greater than the risks of over-procurement ("asymmetric risk). What is your response?

A. Reiterating earlier comments, I believe a fundamental threat to achieving the state's goals is to fail to provide reliable service in the transition. Over-reaching in attributing potential benefits to resources that provide other benefits, and failing to take appropriate action to ensure reliable system operation will jeopardize reliability as well as continued progress in advancing state goals. Contrary to assurances provided in other testimony in this proceeding, in particular Ms. May's and Mr. Spencer's, rotating outages due to lack of local capacity are noticed by the public, and declining system reliability will not an acceptable consequence of transitioning to a more sustainable energy future.

Mr. Sparks' supplemental testimony drew considerable acrimony in referring to the asymmetrical risk of over-supply versus under-supply. The asymmetrical risk is, in my view, is a statement of fact, not an attempt to encourage decisions based on fear. To the contrary, this is a time for pragmatic decisions enabling the electric system in California to move forward in addressing the complex issues.

Q. Please summarize the ISO's recommendations in this proceeding.

A. Based on the 2009 IEPR and the non-generation resource assumptions embedded in that forecast, the ISO's OTC study has identified capacity deficiencies in the LA Basin and Big Creek/Ventura local areas starting as early as 2018. As Mr. Sparks describes in his testimony, the Commission should authorize the LSEs to procure the resources required to fill the needs identified in the base case scenario by the time frames identified in the study. Procurement should not be limited to conventional resources- in particular storage and CHP should be taken into account- but resources must meet the characteristics described in my testimony. In addition, flexibility attributes should be given considerable weight in the procurement process, as described in Mr. Rothleder's testimony. Consistent with the procedural schedule established for Track 1, the Commission should issue a decision on local capacity needs by the end of 2012 so that RFOs for new resources can begin in 2013.

It is important that the Commission take action this year, not only because of the lead times required for permitting and constructing new generation and the pending OTC compliance dates, but because of the additional uncertainty caused by the current SONGS outage. Future capacity needs that are driven by SONGS can be assessed in the later stages of this docket.

Q. Does this conclude your reply testimony?

A. Yes, it does.