Exh. No. ISO-5

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Turlock Irrigation District and	)	
Modesto Irrigation District	)	
	)	Docket No. EL99-93-000
California Independent System	)	
Operator Corporation	)	

ANSWERING TESTIMONY OF
DEANE LYON
ON BEHALF OF THE
CALIFORNIA INDEPENDENT SYSTEM
OPERATOR CORPORATION

Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.

A. My name is Deane Lyon. I am Director of Operations Support and Training ("OSAT") for the California Independent System Operator ("ISO"). My business address is 151 Blue Ravine Road, Folsom, CA 95630.

Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?

A. I am certified by the California Apprenticeship Council, the Western System Coordinating Council ("WSCC") and the North American Electric Reliability Council ("NERC") as a System Operator. I attended Ohlone Junior College, Fremont, California in 1976, taking business law, business administration and electronics courses. Since being employed first with Pacific Gas and Electric Company ("PG&E") from December 1976 through September 1997 and from October 1997 with the California ISO, I have completed several system operations, supervisory and management courses.

Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE PRIOR TO THE WORK YOU ARE DOING TODAY.

A. I began my professional career with PG&E in 1976 as a System Operator. Through the course of my PG&E career, I worked as a System Operator at both the distribution and transmission switching center levels, and supervised or managed distribution and transmission switching centers, regional transmission departments and a regional operator training

program. I was an instructor at the PG&E System Operator Training Center and Power System simulator. The last seven years of my career with PG&E were spent in their Energy Control Center as a Transmission Dispatcher, Interchange Scheduler, Generation Dispatcher and Senior Operations Supervisor, in that order. As Senior Operations Supervisor, or Shift Supervisor, I was responsible for the safe and reliable operation of the PG&E Control Area grid which, prior to its incorporation into the ISO Control Area, spanned from Bakersfield in the south to the California-Oregon border in the north, and from the California coast to the California-Nevada border in the east.

I joined the California ISO in October 1997 as a Shift Manager, assuming the same responsibilities as I had at PG&E, however with a considerably larger Control Area that includes most of the state of California, and with the added market component. I moved from Grid Operations to the OSAT Department in late 1999 as an Operations Trainer. I became manager of Operations Support in June 2000, and recently have accepted the position of Director, Operations Support and Training.

Q. WHAT ARE YOUR CURRENT RESPONSIBILITIES AT THE ISO?

A. I am currently Director of the OSAT Department at the ISO. Personnel that report directly to me include managers for the following groups: Operations Support, Operations Training, and Operations Applications

Support. The primary role of OSAT is to provide support to all departments within the Operations Division, including the development of training programs, real-time operations support and development of tools for operations. OSAT provides training and support to all groups within the Operations Division, to other departments within the ISO, and to Market Participants, to ensure and enhance system reliability as well as to facilitate and expand workably competitive markets.

As the Director of OSAT, I am responsible for overseeing preparation and administration of training across all operations groups, other groups in the ISO, and Market Participants; providing support for ISO efforts to interface with and incorporate markets and deregulation from an operations perspective as they develop inside and outside the ISO; updating, creating and maintaining all ISO Operating Procedures; implementing emergency response programs and procedures within the ISO and in coordination with state and federal agencies; providing presentation development and support for the Operations organization; and reviewing ISO Tariff changes, legislation, and regional and national operating organization polices from an operations feasibility point-of-view.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN A REGULATORY PROCEEDING?

A. Yes. I have submitted testimony in Docket No. Docket No. ER01-313-000, *et al*. regarding the ISO's position with regard to certain billing determinants for the ISO's Grid Management Charge.

Q. AS YOU TESTIFY, WILL YOU BE USING ANY SPECIALIZED TERMS?

A. Yes, I will use capitalized terms as defined in the Master Definitions Supplement, Appendix A of the ISO Tariff. I would note, however, that the definitions of Load, Generation, Generating Units, and certain other terms refer specifically to the ISO Control Area or the ISO Controlled Grid. In addition, operators often use the term "load" as a shorthand for Demand from Load, and "resources" as a shorthand for Generation from Resources, as in the concept of balancing load and resources. I will therefore be using a number of these terms, without capitalization, in their more general meaning.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of this testimony is to respond to portions of the Direct Testimony of Paul G. Scheuerman (Exh. No. TID-1). In particular, I respond to Mr. Scheuerman's assertions that the requirement that TID enter a Participating Generator Agreement ("PGA") in order to participate

in the ISO's markets is discriminatory because the ISO does not impose a similar requirement on System Resources – i.e., generating units outside the ISO Control Area that can participate in the ISO's markets.

Q. WHAT IS THE ISO CONTROL AREA?

A. The WSCC Minimum Operating Reliability Criteria ("MORC") include the following requirement:

> **Inclusion in control area.** Each entity operating transmission, generation, or distribution facilities shall either operate a control area or make arrangements to be included in a control area operated by another entity. All generation, transmission, and load operating within the Western Interconnection shall be included within the metered boundaries of a WSCC control area. Control areas are ultimately responsible for ensuring that the total generation is properly matched to total load in the Interconnection.

The ISO Control Area is the territory for which the ISO is the WSCC designated Control Area operator. It constitutes the former Control Areas of the Participating Transmission Owners – PG&E, Southern California Edison Company, and San Diego Gas & Electric Company – and includes the TID service territory. The ISO is ultimately responsible for ensuring the safety and reliability of the ISO Control Area, fulfilling our responsibility as Control Area operator to the Western Interconnection, and for compliance with WSCC MORC and NERC operating policies.

Q. WHAT ARE THE ISO's CONTROL AREA RESPONSIBILITIES?

A. These responsibilities are significant. The manner in which a Control Area operator carries out these responsibilities will have an impact not only on its own Control Area, but also on the Western Interconnection as a whole. They include, but are not limited to the following:

- System security analyses
- Setting transmission maintenance standards
- System planning to ensure overall reliability
- Integration with other Control Areas
- Emergency management
- Transmission line, equipment and Generator Unit outage coordination
- Energy scheduling for Generating Units, imports, exports, and Wheeling in the Day-Ahead and Hour-Ahead of actual operations and reconciling those Schedules after-the-fact
- Conducting annual and multi-year studies to determine the need for Reliability Must-Run Generation contracts
- Performing operational studies
- Real-time frequency control, i.e., the continuous balancing of load and resources
- Monitoring time error and, as WSCC time error monitor, initiating and terminating manual time error corrections for the entire Western Interconnection
- Compliance with WSCC MORC, including: generation control and performance; transmission operation; interchange scheduling; system coordination; emergency operations; operations planning; telecommunications; and operating personnel and training
- Compliance with NERC policies and NERC Standards compliance reporting

- Compliance with WSCC Reliability Management System (RMS) monitoring and reporting criteria

- Managing unscheduled flow through the ISO Control Area, including initiating, terminating and complying with requests of other Control Areas to participate in the WSCC Unscheduled Flow Reduction procedure

- Managing inadvertent interchange and reporting status to the WSCC

The WSCC and NERC set the standards for Control Areas.

Q. MR. SCHEUERMAN NOTES THAT SYSTEM RESOURCES ARE NOT REQUIRED TO SIGN A PGA OR "YIELD CONTROL" OF THE GENERATING UNITS TO THE ISO. WHY IS THIS NOT DISCRIMINATORY?

A. Due to the fact that TID's Generating Units are within the ISO Control Area, they are not similarly situated to System Resources, and in fact are significantly different. Mr. Scheuerman's argument to the contrary disregards the function of Control Areas, which are the entities through which the reliability of the interconnected electric grid is maintained, and the manner in which the ISO and other Control Area operators fulfill that responsibility. The ISO must match resources and load in its Control Area within the small tolerances specified under WSCC reliability criteria at all times. In order to do so, the ISO must have the ability to direct, as system conditions and operating circumstances require, the operations, including real-time production, start-up and shut-down, of Generating Units within its

Control Area and must acquire real-time data on these Generating Units. The ISO simply does not require that degree of control or that level of data detail with respect to external resources, i.e., System Resources, since these resources and associated load responsibility are the responsibility of other Control Area operators. The adjacent Control Area operator's responsibility with regard to System Resources is simply to maintain interchange schedules with the ISO across specific interconnection points. It is not required to match those utilities' loads and resources on a minute-to-minute basis or to associate specific interchange schedules with specific resources.

To expand further, a System Resource is a firm Energy schedule to the ISO from an adjacent Control Area. It is essentially a contract obligating that Control Area operator to supply the scheduled Energy even though a generator associated with the schedule experiences a curtailment or an outage. By the nature of the schedule being firm, the adjacent Control Area operator is obligated to provide operating reserve associated with that schedule on a 1 MW-for-1 MW basis, thereby ensuring the delivery of that schedule across the agreed upon point of interchange.

Moreover, just as resources within the ISO Control Area are subject to the limited control exercised by the ISO, resources in other Control Areas are subject to the operational control requirements of the operators of those

Control Areas – and necessarily cannot be under any type of control by the ISO. For the ISO to exercise any control over resources located in other Control Areas would be a hindrance to the reliable operation of that Control Area and, in fact, to the Western Interconnection.

Q. MR. SCHEUERMAN ASSERTS THAT TID IS IDENTICAL TO A SYSTEM RESOURCE FROM A SCHEDULING AND METERING STANDPOINT, AND THAT THE DATA REQUIREMENTS THAT THE ISO TARIFF WOULD IMPOSE ON TID THROUGH THE PGA ARE THEREFORE DISCRIMINATORY. WHY DOES THE ISO TREAT SYSTEM RESOURCES DIFFERENTLY IN THIS REGARD?

A. The ISO has fundamentally different needs for data from Generating Units and Loads in its Control Area than from generating units and loads located outside of the Control Area. As I noted, the ISO must maintain a constant real-time balance between Generation and load in its Control Area. The ISO needs information on Generating Units within the Control Area in order to calculate system load in real-time and maintain the required level of Operating Reserves, and to balance Generation and load by dispatching Imbalance Energy from bids in the Supplemental Energy market and Energy bids associated with Spinning and Non-Spinning Reserve capacity. Because the ISO is not responsible for maintaining Operating Reserves for load outside of the Control Area other than for on-

demand obligations to other Control Areas as noted above, it does not require the information from System Resources.

Q. WHY DOES THE ISO REQUIRE TELEMETRY DATA FROM TID IN ORDER TO MAINTAIN BALANCE BETWEEN GENERATION AND LOAD?

A. TID is part of the ISO Control Area. Thus, if TID were to experience a loss of Generation, it is the ISO, as Control Area operator, who is responsible to replace that loss. The ISO's Area Control Error ("ACE") would reflect that Generation shortage, and the ISO would be responsible to return Control Area load and Generation into balance. In order for the ISO to properly perform this function, the ISO is required to maintain a supply of unloaded operating capacity, i.e., Operating Reserve, to be used to respond to a loss of Generation or other real-time Energy disturbance. The ISO must know the amount and the location of Operating Reserves within the Control Area. The WSCC MORC Section 1.A.7, Operating Reserve Distribution, states the following:

> Prudent operating judgment shall be exercised in distributing operating reserve, taking into account effective use of capacity in an emergency, time required to be effective, transmission limitations, and local area requirements.

Further, NERC Policy One, Generation Control and Performance, states:

> OPERATING RESERVE shall be dispersed throughout the system and shall consider the effective use of capacity in an emergency,

> time required to be effective, transmission limitations, and local area requirements. Spinning reserve should be distributed to maximize the effectiveness of governor action.

Moreover, there is currently language in a proposed and widely accepted revision to WSCC Operating Reserve criteria, which states:

> The Control Area Operator shall have sufficient knowledge at all times of the amount and location of the operating reserve that is in place to meet his or her Control Area's/Reserve Sharing Group's requirements and to operate within OTCs.

Implicit in the above quoted statements is the responsibility for the Control Area operator to have knowledge, at all times, of the amount and location of Operating Reserve so that when dispatched, the effect on transmission line and equipment flows can be anticipated. A lack of such information would complicate efforts to comply with the requirement under the WSCC MORC to calculate Operating Reserve that can be fully activated within ten minutes. Thus the ISO must have telemetry data from TID's Generating Units and all other Generating Units in the ISO Control Area in order to comply with WSCC MORC and to be able to detect and respond appropriately to a loss of Generation or other Energy disturbance.

Q. COULD YOU PROVIDE AN EXAMPLE?

A. A very simple and credible example is the following: if a TID Generating Unit with an output of 50 MW were to suddenly disconnect from the grid as the result of generator or auxiliary equipment trouble, an ISO ACE of –50 MW would result, assuming a zero ACE prior to the event. A -50 MW

ACE is indicative of a 50 MW imbalance between ISO Control Area load and resources, and the ISO is responsible for the dispatching of Imbalance Energy from Operating Reserves or the Supplemental Energy market to regain that balance. This sudden loss of a 50 MW Generating Unit would also result in a system frequency deviation that would be observed over the entire Western Interconnection until the ISO has regained the load-resource balance. In addition, transmission line and equipment MW flows in the area of the Generating Unit disconnection would change. The ISO, as Control Area operator, must monitor these changes and be prepared to mitigate any resulting Congestion, again by dispatching Imbalance Energy from Operating Reserve or Supplemental Energy bids. These bids must be dispatched in the proper amount and from the proper location in order to mitigate, not to increase the Congestion or compound other problems resulting from the Generating Unit disconnection.

Q. HOW DOES THE ISO'S NEED TO MAINTAIN ADEQUATE OPERATING RESERVES CREATE THE NEED FOR TELEMETRY DATA?

A. Under WSCC Criteria, the ISO's load responsibility is the basis for accurately calculating and adequately maintaining Operating Reserve. The WSCC defines load responsibility as "Control Area firm load demand plus those firm sales minus those firm purchases for which reserve capacity is provided by the supplier." Thus, in order to determine load

responsibility, the ISO must be able to accurately calculate ISO Control Area firm load demand. Because it would be impractical to obtain real time data from all Loads, Control Area firm load demand is measured as the sum of internal Generation plus net interchange. Load responsibility is that sum minus firm Energy imports (the portion of the ISO load for which another Control Area is, based on the type of interchange schedule, providing operating reserve) plus firm energy Exports (the portion of another Control Area's load for which the ISO is, based on the type of interchange schedule, providing Energy and/or Operating Reserve). The ISO therefore cannot meet its obligation to the WSCC without real-time telemetered information on Generation; neither can it relinquish or be excused from these obligations.

Inadequate load calculations and inaccurate or inadequate knowledge of the amount and the location of reserves threaten reliability. Without such knowledge, it becomes difficult to protect the system against credible contingencies. As I have described, during such contingencies, the ISO as Control Area operator must have sufficient unloaded capacity, i.e., Operating Reserve, in the proper location to respond to a sudden loss in capacity or Generation. Hence, without accurate calculations of Generation and load, the ISO's Control Area responsibilities are compromised, as is the reliability of the Control Area and the Western

Interconnection. Indeed, continuity of service to load is the primary objective of the WSCC MORC.

As the WSCC MORC states regarding Operating Reserve:

> The reliable operation of the interconnected power system requires that adequate generating capacity be available at all times to maintain schedule frequency and avoid loss of firm load following transmission or generation contingencies. This generating capacity is needed to:
>
> - Supply requirements for load variations.
> - Replace generating capacity and energy lost due to forced outages of generation or transmission equipment
> - Meet on-demand obligations
> - Replace energy lost due to curtailment of interruptible imports.

Mr. Scheuerman would have us ignore these operating requirements.

In contrast, the ISO is *not* responsible for maintaining adequate reserves for external demands, other than those scheduled as firm Energy or capacity exports, even when the supplier schedules transactions on the ISO Controlled Grid. The ISO only requires accurate data regarding interchange schedules.

Q. WHY IS TID's INTERCONNECTION AGREEMENT WITH PG&E NOT SUFFICIENT TO ALLOW THE ISO TO ENSURE THE RELIABILITY OF THE CONTROL AREA?

A. Under its Interconnection Agreement with PG&E, as Mr. Scheuerman explains it, TID provides PG&E with net scheduling information and provides its own Spinning and Non-Spinning Reserves. I have already explained why the net scheduling information is inadequate for the ISO's performance of its responsibilities. In addition, the ISO cannot simply rely upon TID's commitment to provide reserves. As the Control Area operator, the ISO must have data available to ensure that the reserves are available when needed. Unlike PG&E, the ISO does not own Generating Units, from which it can "make up the difference" if TID fails to live up to that commitment; it must rely on resource owners, like TID, to make that Generation available. If the ISO did not insist on the ability to verify that TID in fact was providing the reserves that it committed to provide, it could not insist on that ability with respect to other Generating Unit owners in its Control Area, and its ability to maintain reliability would be fatally compromised. Experience has shown that the ISO cannot simply take Market Participants at their word, hoping that they will live up to commitments to supply Generation. In a competitive environment, Generators seek every advantage and cost savings. The ISO has had to remain vigilant to enforce Market Participants' obligations to supply reserves and follow dispatch instructions. To do otherwise would show blatant disregard for WSCC MORC and NERC Operating policies.

Moreover, as Mr. Scheuerman admits, TID does not provide its own Regulation. Although he asserts that TID "buys" that Regulation from PG&E, the fact is that PG&E is no longer responsible for using Regulation to constantly maintain system balance. It is the ISO that must maintain the constant communication with Generating Units providing Regulation and it is the ISO's system that responds immediately when a Generating Unit in the Control Area fails or a Load suddenly changes.

It is perfectly appropriate for TID to contract with PG&E to provide Regulation on TID's behalf. The Regulation provided by PG&E, however, must be controlled by the ISO if it is to be used to ensure System Reliability. The fact that TID purchases Regulation from PG&E does not substitute for the services provided by the ISO.

Of course, if TID really believes that it is self-sufficient, and does not impose reliability burdens on the ISO, TID could seek designation as its own Control Area. Under such circumstances, TID would truly be a System Resource, and would not need to enter into a PGA with the ISO.

Q. THERE AREA NO FURTHER QUESTIONS.