THE UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

San Diego Gas & Electric Company, Complainant,	)	
v.	)	**Docket No. EL00-95-045**
Sellers of Energy and Ancillary Services Into Markets Operated by the California Independent System Operator and the California Power Exchange, Respondents.	)	
Investigation of Practices of the California Independent System Operator and the California Power Exchange	)	**Docket No. EL00-98-042**

PREPARED DIRECT TESTIMONY OF
SPENCE GERBER ON BEHALF OF
THE CALIFORNIA INDEPENDENT SYSTEM
OPERATOR CORPORATION

I. INTRODUCTION

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

A. My name is Spence E. Gerber. I am employed by the California Independent System Operator Corporation ("ISO") as the Director of Billing and Settlements. My business address is 151 Blue Ravine Road, Folsom, CA 95630.

Q. WHAT ARE YOUR DUTIES AS DIRECTOR OF BILLING AND SETTLEMENTS?

A. I oversee the operation of the ISO's financial settlement systems to ensure that sellers, buyers, and other parties interacting with the ISO markets are paid and charged appropriately according to the settlement provisions of the ISO Tariff. In my current position I oversee a staff of 33 professionals and analysts who are responsible for settling the wholesale electricity activities for all of the ISO's participants, and producing preliminary and final settlement statements and invoices. In addition, my staff is often called upon to produce estimates of the impacts of various hypothetical changes in the ISO's Settlement procedures or in various inputs to the settlement process and to develop the algorithms and processes required to implement changes to the ISO Tariff.

Q. PLEASE DESCRIBE YOUR EXPERIENCE AS IT PERTAINS TO THE ELECTRIC UTILITY INDUSTRY.

A. Prior to joining the ISO, I was employed for sixteen years at Portland General Electric. I spent over ten of those years in the wholesale power division, where I became the Manager of Power Coordination, a position I held during the company's functional separation under Order 889. During this period my responsibilities included a substantial amount of activity that would normally be associated with the Settlements function since the

department had the responsibility of reconciling and invoicing wholesale power transactions. For the last four years I have been at the ISO. In total, during the course of my employment at the Portland General Electric Company and during my tenure at the ISO, I have over fourteen years of experience in the wholesale electric business in both merchant and reliability functions.

Prior to my current position, my duties at the ISO have included oversight of the Interchange Scheduling department. This department has the responsibility to ensure that all relevant sections of the North American Electric Reliability Council ("NERC") reliability criteria and Western Systems Coordinating Council ("WSCC") Minimum Operating Reliability Criteria ("MORC") are met as they pertain to interchange scheduling. In addition, the Interchange Scheduling department ensures that the provisions of the ISO Tariff, as they relate to open and non-discriminatory access to the ISO Controlled Grid, are met. I assumed my current position in February 2000 and since that time, the ISO has implemented several significant changes in the settlement methodology including the implementation of 10-minute settlements.

Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION?

A. Yes. I have testified in the Alturas proceeding, Docket No. ER99-28, as well as in the Grid Management Charge proceeding, Docket Nos. ER02-250, et al.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I will describe in general terms the ISO's Settlements process for real time Energy transactions and Ancillary Services transactions. Again in general terms, I will describe how the ISO undertook the re-run of the Settlements process for transactions during the period October 2, 2000 through June 20, 2001 (the "refund period") in compliance with the Commission's directive in its July 25 Order. Also, I will describe the process by which the ISO has addressed the second and third issues in this proceeding, as set forth in the Commission's July 25 Order and the Presiding Judge's order of August 14, 2001, namely "the amount of refunds owed by each supplier according to the [July 25 methodology]" and "the amount currently owed to each supplier (with separate quantities due from each entity) by the ISO, investor owned utilities, and the State of California." 96 FERC ¶ 61,120 at 61,520. Finally, through attached Exhibits, I will present the results of those processes.

Q. PLEASE EXPLAIN THE ORGANIZATION OF YOUR TESTIMONY.

A. In Part II, I provide a basic background concerning the ISO's Settlement system and the manner in which the ISO generates Settlements statements and invoices, focusing on those areas that are particularly germane to the Commission-mandated re-calculation, or re-run, of the Settlement system. In Part III, I describe how the ISO undertook the Settlement re-run mandated by the Commission. In Part IV, I discuss how the ISO has displayed the results of the re-run. Finally, in Part V, I explain how, and the extent to which, the ISO has been able to address the second and third issues set for this proceeding, how the ISO has displayed the results, and how these results might be used by parties to determine amounts owed or owing by each Scheduling Coordinator in the ISO's Imbalance Energy and Ancillary Services markets during the refund period.

II. BACKGROUND ON THE ISO'S BILLING AND SETTLEMENTS SYSTEM

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE ISO'S SETTLEMENT AND BILLING PROCESS.

A. The ISO's settlement and billing process generates daily statements and monthly invoices for Scheduling Coordinators based on schedules and

meter data submitted by Scheduling Coordinators.[1] An array of charges and credits are calculated based on activities as they pertain to forward schedules, deviations from those forward schedules, or charges based on the metered load served by Scheduling Coordinators. This information is combined with ISO market pricing information to calculate the payments and charges accrued by Scheduling Coordinators in the manner outlined in Section 11 of the ISO Tariff, the ISO's Settlements and Billing Protocol ("SABP") and the Specification for Settlement Statement Files, all of which are available on the ISO's web site.

Q. HOW IS THE INTEGRITY OF THE SETTLEMENTS AND BILLING PROCESS ENSURED?

A. All elements of the process, including the manual processes and attendant software are audited annually by an independent auditor to ensure that they operate in accordance with the Tariff and SABP and the settlement activity process documentation derived from these two sources.

[1] Scheduling Coordinators are entities that are certified by the ISO to submit schedules for load and generation from Market Participants that they represent. Scheduling Coordinators are also the entities from which the ISO collects or to which the ISO distributes funds related to transactions settled in the ISO's markets.

Q. WHAT IS THE DIFFERENCE BETWEEN A STATEMENT AND AN INVOICE?

A. A Settlement statement shows the activities for which a Scheduling Coordinator was charged and credited on a daily basis, based on its activity in the ISO markets on a particular trade date. The statement provides details disaggregated on the basis of ten-minute intervals where applicable and specific activities delineated by Charge Types ("CTs"). These statements are primarily a numeric matrix of charges and credits. An example of a daily settlement statement is attached as Exhibit No. ISO-25. Although most users develop or purchase a template to allow easier review and manipulation of this data, such tools are not necessary to understand the data communicated in the statement if the reader is familiar with the ISO's Charge Types and the manner in which the statements are formatted. To this end, the ISO has posted on its website a document entitled Specification for Settlement Statement Files, which explains the information that is expressed in each column and row on the settlement statement matrix.

An invoice, on the other hand, summarizes for Scheduling Coordinators the information contained in the daily statements issued over the course of a month, netting all charges and credits for every day during the month, and determines if a Scheduling Coordinator owes the ISO market, or is

owed by the ISO market in any given month. While all activities are shown on the daily settlement statements, the ISO generates several distinct monthly Invoices that are generated by the ISO, including Market, Grid Management Charge and FERC Fee invoices. Attached as Exhibit No. ISO-26 is an example of a monthly market invoice.

Q. IN YOUR LAST ANSWER YOU MENTIONED "CHARGE TYPES." WHAT IS A CHARGE TYPE?

A. A Charge Type is a code that describes a particular activity for which a Scheduling Coordinator is being either charged or credited. There are general categories of charge types associated with the purchase and sale of Ancillary Services, Imbalance Energy, and Transmission Services, as well as categories associated with other activities undertaken by the ISO in its role of reliably operating the Grid . The majority of the 60-plus active Charge Types are associated with market activity and accounted for on the Market invoice. Attached to my testimony as Exhibit No. ISO-27 are the ISO's charge type matrices, which list and briefly describe each active Charge Type.

Q. PLEASE EXPLAIN, BRIEFLY, HOW CHARGES AND CREDITS FOR IMBALANCE ENERGY ARE SETTLED THROUGH THE ISO'S SETTLEMENT AND BILLING SYSTEM.

A. There are two categories for Imbalance Energy, Instructed and Uninstructed. Imbalance Energy is classified as "Instructed" when the ISO instructs a Scheduling Coordinator to change a resource's output, *i.e*., deviate from its forward schedule, and is settled pursuant to ISO Tariff Section 2.5.23. "Uninstructed" Imbalance Energy is Energy that is generated as a result of a resource deviating from its forward schedule without instruction from the ISO. Uninstructed Imbalance Energy is settled pursuant to Section 2.5.32.2.1 of the ISO Tariff. The amount of the deviation, expressed in MWh, whether Instructed or Uninstructed, is multiplied by the applicable price for the relevant interval to determine the amount to be credited or charged.

Charges for Imbalance Energy are allocated to Scheduling Coordinators that have negative deviations from their forward schedules that create real-time demand. These charges are calculated by comparing the forward schedule to the metered amounts, and multiplying that deviation by the Instructed Energy price for the relevant interval. Contingent on the charge methodology in place, costs for energy procured to meet system

wide requirements that are above the Instructed Energy price, are allocated in the same manner.

Credits for Instructed Imbalance energy are calculated in a similar manner with the delivered quantities for dispatch instructions being paid at the Instructed Energy price. Any as-bid portion of an Instructed Imbalance Energy delivery (that is, the difference between the Instructed Energy price and the bid price) is paid separately.

Q. PLEASE EXPLAIN, BRIEFLY, HOW CHARGES AND CREDITS FOR ANCILLARY SERVICES ARE SETTLED THROUGH THE ISO'S SETTLEMENT AND BILLING SYSTEM.

A. Credits for Ancillary Services are based on the confirmed amounts of a particular service measured in MW supplied by a Scheduling Coordinator (*i.e.*, Spinning Reserve, Non-Spinning Reserve, etc.) multiplied by the clearing price established in the Day-Ahead or Hour-Ahead market in which that service was scheduled. Amounts for each service awarded in these forward markets are reflected on final schedules, and the ISO performs validation checks once meter data is received for each resource to confirm that the service was delivered. Charges for Ancillary Services are allocated to loads, as reported by the Scheduling Coordinators for those loads, based on the ratio of each Scheduling Coordinator's

Ancillary Services requirements to the total system requirement. Charges and credits for Ancillary Services are settled pursuant to Sections 2.5.27 and 2.5.28 of the ISO Tariff.

Q. IS THERE ANY PARTICULAR CHARGE TYPE THAT PERTAINS TO THE SETTLEMENT OF ANCILLARY SERVICES AND IMBALANCE ENERGY THAT YOU CONSIDER IMPORTANT TO HIGHLIGHT?

A. Yes. Because the ISO is required to maintain cash neutrality for every relevant settlement period, there are charges and credits that flow to Scheduling Coordinators through a Neutrality Adjustment charge. This authority is derived from several Sections, including 11.2.9 and 11.2.4.2.1, of the ISO Tariff. This is a load-based charge which accounts, among other things, for mismatches in the amounts charged or credited for specific services. The charges and credits are allocated to Scheduling Coordinators based on their pro-rata share of system metered load.

Q. HOW ARE OUT-OF-MARKET ("OOM") TRANSACTIONS ACCOUNTED FOR IN THE ISO'S SETTLEMENT SYSTEM?

A. OOM transactions are first paid at the Instructed Energy price as Instructed energy and any payments in excess of the Instructed Energy price are added to the Instructed Energy price paid to the seller. Prior to Amendment 33, this additional payment was made through Charge Type

401 and after Amendment 33 was in place, through Charge Type 481, along with any other above-Market Clearing Price payments for Instructed Energy. Recovery of OOM charges prior to Amendment 33 allocated the Market Clearing Price portion through Charge Type 407 and the above-Market Clearing Price portion through Charge Type 1010 (Neutrality Adjustment). After Amendment 33, the above-Market Clearing Price portion was recovered through Charge Type 487. There are some instances where the entire amount of an OOM purchase is recovered through Charge Type 1010, as allowed in section 11.2.4.2.1, if it first was recorded as Uninstructed Energy, paid only the Uninstructed Energy price, but later manually adjusted to fully compensate the seller for the transaction.

Q. NOW THAT YOU'VE EXPLAINED THE BASIC COMPONENTS OF THE ISO'S SETTLEMENTAND BILLING PROCESS, PLEASE DESCRIBE THE STEPS THROUGH WHICH THAT PROCESS MOVES FROM A SPECIFIC TRADE DATE TO THE FINAL STATEMENT FOR THAT PARTICULAR TRADE DATE.

A. The ISO's Settlement process begins when the ISO receives final Hour-Ahead schedules submitted by Scheduling Coordinators for a particular trade date, which are stored in the Scheduling Infrastructure ("SI") database. During real-time operations deviations from final Hour-Ahead

schedules for particular resources may occur, either instructed or uninstructed (as described earlier). Also, events may occur in real-time that affect resources that were not included in a final Hour-Ahead schedule; for example, the ISO may need to dispatch a Generating Unit that was not committed to provide any Energy during a particular interval under the Scheduling Coordinator's Final Hour-Ahead schedule. Following real-time operations, the next important event in the ISO's Settlement process is the receipt of meter data from Scheduling Coordinators, which is stored in the Meter Data Acquisition System ("MDAS"). This meter data is transmitted to the ISO Settlements System, where calculations are performed that compare the meter data to final Hour-Ahead schedules and ISO dispatch Instructions. Based on the results of this comparison, the ISO then publishes a preliminary settlement statement 38 business days after a trade date. Scheduling Coordinators have an opportunity to dispute charges indicated on this preliminary statement and to submit corrected meter data prior to the calculation and publishing of final settlement statements, which occurs 51 business days after a trade date. If there is a dispute, the resolution of the dispute is reflected on the relevant final settlement statement. A monthly invoice, reflecting an entire month's activity, is produced when the settlement statements for the last day of a calendar month are published. The timing

of the settlements and invoice process is outlined in the ISO payment calendar, which is available on the ISO's web site.

Q. HOW DOES THE ISO VERIFY THE ACCURACY OF THE DATA PROCESSED IN THE SETTLEMENT SYSTEM?

A. First, the ISO Settlements software is audited by an independent firm of auditors to verify its consistency with the ISO Tariff and Settlements and Billing Protocol. This annual SAS 70 audit is done to assure that the processes and algorithms used in the settlement system are applied consistently and adequate controls are in place. Some of the elements of validation include checking to assure that each batch of statements are cash neutral, that any accounting and manual adjustments reversals are neutral and that bulk load data for manual entries are received by the settlement system prior to publishing statements.

Q. YOU PREVIOUSLY MENTIONED MANUAL ADJUSTMENTS AND MANUAL ENTRIES. DOES THIS MEAN THAT THERE ARE CERTAIN FUNCTIONS PERFORMED OUTSIDE OF THE AUTOMATED SETTLEMENTS PROCESS?

A. Yes. Some elements of the settlement calculations are made "manually." This means that settlements personnel extract certain schedule, meter and pricing data from the ISO databases, perform calculations consistent

with the ISO Tariff outside the automated settlements system in a separate spreadsheet tool, and re-introduce the results into the settlement computer system prior to the automated publication of settlement statements so that the results are included with those produced by the automated system. These operations are termed "manual adjustments" and "manual entries."

Q. PLEASE DESCRIBE THE REASONS THESE MANUAL ACTIONS ARE NECESSARY.

A. The data required to compensate Scheduling Coordinators for some actions taken by ISO dispatchers and operators to assure reliability, as well as the data necessary to allocate the resultant charges, do not flow through to the settlements system through the ISO's automated methods. Therefore, that data must be manually entered into the databases to assure that all activities are accounted for.

"Manual adjustments" represent actions performed on or alterations made to already existing data based on the granting of a dispute or correction of an error, with the results then re-transmitted to the automated settlements system. For example, if there is a resolution of a billing dispute, a manual adjustment must be processed and the results re-entered into the automated settlements system by a settlements analyst. I should mention

that not every dispute requires that a "manual adjustment" be made. Resolution of some disputes results only in a change in some data that had been automatically transmitted to the automated settlements system. In such a case, the data is corrected in the automated system in which it had been collected and is then retransmitted automatically to the automated settlements system, which is then re-calculated using the corrected data.

Q. COULD YOU PROVIDE AN EXAMPLE OF A "MANUAL ADJUSTMENT?"

A. Yes. For purposes of this illustration, assume that there was a "soft cap" of $150 during a particular interval say during January 2001. A generator submits a bid for 100 MW at a price of $200/MWh, the bid is accepted by the ISO, and the generator delivers 100 MW to the grid. In this circumstance, the ISO should pay the generator $200, which would be entered into the settlement system under two Charge Types: $150 (*i.e.*, the amount up to the soft cap), under Charge Type 401, and $50 (*i.e.*, the portion paid above the soft cap), which we call the "as bid" portion under Charge Type 481. Assume, however, that in settling this transaction, the ISO overlooks the "as bid" portion and pays only $150/MWh. In order to correct this oversight, the ISO Settlements analyst would go back into the system and ensure that the price component of the as-bid portion

(previously recorded as $0/MWh, corrected to indicate $50/MWh) was correct prior to a re-calculation of the settlements system.

Q. PLEASE PROVIDE AN EXAMPLE OF A "MANUAL ENTRY."

A. Manual entries are necessary when certain changes to the ISO operations, (whether ordered by FERC or caused by changes to the market design) are implemented in an expedited manner before permanent changes can be made to the software of the automated settlements system. Based on these changes to the ISO Tariff and protocols, settlement algorithms are developed in Access or Excel spreadsheets. The appropriate data is then extracted from the SI, SA and MDAS systems, loaded into this "outboard process" (as we call it), the algorithm is applied to the data, and the results are reintroduced via a bulk load into the automated settlement system prior to publishing statements. In addition to these manual entries caused by expedited charges in operations, some of the charges that are calculated monthly, like the FERC transaction fee, are tracked and processed in these Access or Excel spreadsheets and then entered into the automated settlements system prior to publishing the statement for the last day of the month, so that they can be included in the monthly invoice.

Q. NOW THAT YOU HAVE PROVIDED A BASIC DESCRIPTION OF THE ISO'S SETTLEMENT AND BILLING PROCESS, CAN YOU PROVIDE A RELATIVELY SIMPLE EXAMPLE OF HOW THAT PROCESS WOULD WORK?

A. Focusing on Imbalance Energy, I'll describe how the Energy requirements of two scheduling coordinators are met by both instructed and uninstructed Energy provided by two other Scheduling Coordinators. When an ISO operator requires additional resources to balance load in real-time, that requirement is normally met through merit order dispatch of the BEEP stack. In this simple example, the operator determines that 50 MW is necessary to balance the system and dispatches the next resource in merit order, which determines the Market Clearing Price for the Interval. The 50 MW dispatched belonged to a unit which is represented by SC "A", and was bid in at $75. Once meter data is available, the settlement system is loaded with the schedule and meter information on a resource specific basis, and deviations are calculated. In our example, the SC "A" represented unit's expected energy from the dispatched bid is compared to its actual output in the same interval. Assume that the meter read indicates that the unit's actual output was 55 MWh. For the purposes of settlement, then, SC "A" will be credited with 50 MWh of positive Instructed Energy under Charge Type 401 and 5 MWh of positive Uninstructed Energy under Charge Type 407.

At the time of dispatch, it was unknown to the operator what load would be served by the incremental dispatch. This is determined after-the-fact by the comparison of forward schedule data to meter data. In our example, let's say SC "B", representing load, scheduled 450 MWh in the forward markets with matching resources. Meter data for SC "B" indicates that the resources performed exactly as scheduled, but load meters indicate 495 MWh of consumption, resulting in a 45 MWh net negative deviation in that SC's portfolio. Therefore, SC "B" will be charged for 45 MWh of negative Uninstructed Energy, under Charge Type 407.

Let's say SC "C" scheduled 400 MWh of resources against 400 MWh of inter-SC trades and Exports, and meter data indicates that the resources only produced 390 MWh of energy, resulting in a 10 MWh net negative deviation in the portfolio of SC "C". Therefore, like SC "B," SC "C" will be charged for negative Uninstructed Energy, in this case 10 MWh.

A fourth SC, SC "D", scheduled a Firm import of 10 MWh and had two separate exports of 5 MWh each at two different locations on the grid. In real-time one of these 5MWh exports was curtailed due to a transmission constraint. For the purposes of settlement, then, SC "D" will be credited for positive Uninstructed Energy in the amount of 5 MWh. For the purpose

of illustration, the Uninstructed Energy price at the time of this deviation was $70. The results of the Imbalance energy settlement for these four SCs are presented in the following table:

SC	Demand	Instructed Deviation	Un-instructed Deviation	Instructed $75 (CT 401)	Un-instructed $70 (CT 407)	Total
SC A	0	50	5	-$3750	-$350	-$4100
SC B	495	N/A	-45	N/A	$3150	$3150
SC C	400	N/A	-10	N/A	$700	$700
SC D	5	N/A	5	N/A	-$350	-$350
Note: Negative amounts denote amounts due from the ISO to the SC, while positive amounts denote amounts due to the ISO from the SC.						

Since $600 more is paid than collected in the Imbalance Energy settlement, the difference is collected through the Neutrality Adjustment Charge. Each Scheduling Coordinator with metered demand is assessed its pro-rata share of the shortfall, based on the amount of its demand in relation to total market demand. Since there is 900 MWh of metered demand in this example, the effective rate for this neutrality component is $0.66/MWh. (if we assume the interval was one hour). SC “B” would pay a neutrality charge of $326.70 (495x0.66), and so on for SC “C” and SC “D.”

Q. ARE THERE ELEMENTS OF THE ISO'S SETTLEMENT SYSTEM THAT ARE NOT ADDRESSED IN THIS EXAMPLE?

A. No attempt was made in the previous example to introduce any of the payments and credits associated with Ancillary Services. The sellers of Ancillary Services are paid at the service-specific Market Clearing Price. These costs are allocated to each Scheduling Coordinator based on the ratio of Ancillary Services requirements for the load it represents, to total Ancillary Service requirements for the market. (Any Ancillary Services that are self-provided are netted out before this ratio is calculated.) With respect to the previous example, it is also important to understand that there is no attempt made in ISO operations or settlement processes to make distinct matches between buyers and sellers. In fact, the process from real-time activity to invoicing is comparable to a swap meet with a single cashier. Scheduling Coordinators bring products and services to the "meet" and purchase the same. In some instances a Scheduling Coordinator might only sell on a given day, while on others it might only buy. In some instances an Scheduling Coordinator might both buy and sell on a given day, but it is the net results of those transactions that are settled by the cashier (*i.e.,* the ISO). At the end of the day, the cashier has disbursed just as much as it has taken in, less some perfunctory amount for its overhead (*i.e.*, the GMC). From a cash perspective, this is what occurs each month in the ISO's invoicing and cash settlement

process. The net of what an Scheduling Coordinator bought and what it sold determines whether it walks out the door owing money to or being owed money by the cashier. Finally, the example above does not address the settlement of the "as-bid" portions of transactions, *i.e.*, the portion of payments (and resulting charges) that exceeds the Market Clearing Price or soft cap in effect at any given time.

III. DETAILED DESCRIPTION OF THE ISO'S SETTLEMENT RECALCULATION PROCESS

Q. YOU PREVIOUSLY NOTED THAT THE COMMISSION REQUIRED THE ISO TO RERUN ITS SETTLEMENT SYSTEM AND PROVIDE THAT DATA TO JUDGE BIRCHMAN AND PARTIES IN THE REFUND PROCEDING. WHAT LEVEL OF EFFORT WAS REQUIRED TO DO THIS?

A. As a result of this proceeding, the ISO Settlements staff has produced nine months of Settlements statements on two different occasions. This amount of work would normally have been performed over eighteen months, rather than the four months actually available. We were also continuing, simultaneously, to perform the normal settlements work and, for a portion of the period, to re-run settlements statements in connection with the PG&E bankruptcy proceeding. In order to accomplish the re-runs

required for this proceeding and still perform the other ongoing work, we were required to press into service several large servers normally used for other tasks at the ISO, and the settlements staff was required consistently to work additional hours.

Q. WHAT WAS THE FIRST STEP TAKEN BY THE ISO IN THIS PROCESS?

A. As an initial matter, it was necessary to select a "snapshot" of the ISO's production database as it existed on a date certain in order to provide a baseline group of records to which the ISO could apply the results of the mitigated price calculation. The ISO's production database consists of the existing transaction and price data as provided to Scheduling Coordinators in their regularly published settlement statements and settlement detail files. For purposes of the second re-run, the results of which are submitted with this testimony, the ISO used records in the ISO's production database for trade dates during the refund period, as they may have been amended due to production recalculations because of other reruns or adjustments, through trade dates up to September 27, 2001. These adjustments could have appeared on settlement statements issued by the ISO on dates outside of the refund period, but nevertheless, they affected transactions made during the refund period.

Q. DID THE ISO ALTER ANY OF THE DATA CONTAINED IN THE PRODUCTION DATA BASE AS OF THIS AUGUST 30, 2001 "SNAPSHOT?"

A. No. The ISO did not alter any of the underlying schedules or meter-derived data that is reflected in the "snapshot." The only modification made to the historical data contained in the snapshot database consisted of replacing the originally recorded transaction prices with the mitigated prices calculated pursuant to the Commission's July 25 and December 19 Orders, when appropriate.

Q. HOW WAS THE MITIGATED PRICE APPLIED TO THIS DATA?

A. The mitigated price was used to replace the historical Market Clearing Price or soft cap during the refund period only when that historical Market Clearing Price or soft cap was greater than the mitigated price. Thus, the mitigated price was employed as a "cap" on the historical market transaction price (whether that historical price was a market transaction price or a "soft cap"), and as an absolute cap on the "as-bid" portion of a transaction.

Q. YOU STATED THAT THE MITIGATED PRICE CALCULATED BY THE ISO WAS USED TO REPLACE THE HISTORICAL MARKET CLEARING PRICE OR SOFT CAP ONLY WHEN THAT HISTORICAL MARKET CLEARING PRICE OR SOFT CAP WAS GREATER THAN THE MITIGATED PRICE. PLEASE EXPLAIN THAT CONCEPT IN GREATER DETAIL.

A. Essentially, in applying the mitigated price to transactions that occurred during the refund period, the ISO used four different settlement "schemes" to reflect the operational realties of the ISO's markets during these time periods.

First, for dates October 2, 2000 through December 8, 2000, the ISO's markets were operating under a "hard cap" of $250/MWh, *i.e*., the ISO would only accept bids in the Ancillary Services markets or Real Time Energy Market up to $250, and the Instructed Energy price was always $250 or below. In rerunning its settlement system, the ISO compared the calculated mitigated price to the historical Instructed Energy price. If the mitigated price for a particular interval during this period was less than the historical Instructed Energy price, all transactions during that interval were lowered to the level of the mitigated price. If the mitigated price was greater than the historical Instructed Energy price, then prices for transactions were left at the historical Instructed Energy price. Also,

during this time period, there were some OOM transactions entered into with suppliers inside the ISO's Control Area at prices greater than the $250/MWh hard cap. These transactions were capped at the level of the mitigated price.

From the period December 8, 2000 through January 1, 2001, the ISO's markets, pursuant to Tariff Amendment No. 33, operated under a $250 "soft cap." This meant that the ISO would accept bids in the Ancillary Services Market or Real Time Market above $250 if requirements could not be met by bids below this level. The "clearing price," however, was capped at $250. If all demand was met by taking only bids up to $250, the market "cleared" at the price paid the last bid taken, and suppliers that bid less than that price would receive the "clearing price." If required to take bids in excess of $250, the ISO selected bids in merit order and paid the bid amount, but that bid amount above $250 did not establish a new "clearing price."

From January 1, 2001 through May 28, 2001, the ISO's markets, pursuant to the Commission's December 1 Order, operated under a $150/MWh soft cap. This price cap operated under the same mechanism as described above in reference to the $250/MWh soft cap.

If the mitigated price calculated for a particular interval during the period of the soft caps was less than the soft caps (if the soft cap had been activated) or less than the historical Market Clearing Price (if the market had actually cleared below the soft cap), then, in the settlement rerun, all transactions during that interval were lowered to the level of the mitigated price. If the mitigated price was greater than the soft cap or the historical Market Clearing Price, then, in the rerun, prices for transactions were left at the soft cap or the historical Market Clearing Price. If a transaction during this soft cap period was bid and paid over the soft cap, then, in the rerun, the mitigated price was employed as a hard cap for the "as bid" portion of the transaction. For example, if a supplier in January 2001 had bid 20 MWh of energy into the Imbalance Energy market for a price of $300/MWh, that supplier would automatically receive the $150/MWh price for Imbalance Energy (Charge Type 401), which was paid to all accepted bids pursuant to the soft cap (whether the bid was above or below $150), as well as the $150/MWh above-cap/as-bid portion (Charge Type 481). However, assume that the mitigated price for that interval was determined to be $200/MWh. In the settlement rerun, the seller would still receive the portion of the bid up to the soft cap ($150/MWh). However, the as-bid portion would be capped at the mitigated price, in this instance, $200/MWh. Therefore, the seller would be credited only $50/MWh for the

as-bid portion of the transaction, under Charge Type 481, rather than the $150/MWh that they originally received.

Finally, during the period May 29, 2001 through June 20, 2001, the ISO's markets were operating under the proxy-price methodology set forth by the Commission in its April 26 Order, which stipulated that the ISO was to use a proxy Market Clearing Price during reserve deficiency hours. Pursuant to the Commission's instructions in the July 25 and December 19 Orders, the ISO did not "re-mitigate" prices already mitigated pursuant to the April 26 methodology.

Q. PLEASE DESCRIBE THE OTHER KEY ASPECTS OF THE ISO'S APPLICATION OF THE MITIGATED PRICES IN THE SETTLEMENTS RERUN PROCESS.

A. The following are the key aspects:

(1) The mitigated price was applied to both Instructed and Uninstructed Imbalance Energy prices .

(2) Penalties for generators that failed to respond to ISO dispatch instructions during emergencies pursuant to section 5.6.3 of the ISO Tariff (Charge Type 485) were recalculated using the mitigated prices.

(3) Ancillary Services capacity prices were mitigated using the lower of the transaction price for the particular Ancillary Service or the hourly average mitigated price set forth in Exhibit No. ISO-4.

(4) Transactions made pursuant to section 202(c) of the Federal Power Act were excluded from mitigation.

(5) Certain OOM transactions, representing the bilateral transactions entered into by the California Department of Water Resources ("CDWR/CERS") with sellers, were excluded from mitigation.

(6) Certain rare purchases of Ancillary Services by the ISO in real-time necessitated by the lack of Ancillary Services available through the standard auctions were not mitigated.

Q. YOU EXPLAINED EARLIER THAT A MARKET PARTICIPANT MAY DISPUTE SPECIFIC ITEMS ON A SETTLEMENT STATEMENT. HOW HAS THE ISO ACCOUNTED FOR THESE DISPUTES IN ITS SETTLEMENT AND BILLING RERUN?

A. First, with respect to those disputes that were resolved through manual adjustments to prices, the ISO compared the adjusted prices to the mitigated price calculated for the interval in which the transaction subject to dispute occurred, and, if necessary, re-adjusted the price based on the application of the mitigated price. With respect to those disputes resolved through an adjustment to billable quantities, the ISO reviewed those

disputes to determine whether those transactions occurred during times in which price was modified pursuant to the July 25 mitigation methodology, to ensure that the granted disputes were subsequently re-adjusted to reflect mitigated price. There were several limitations, however, on the universe of disputes reviewed for purposes of this rerun. First, the ISO only reviewed those disputes that had an Ancillary Services or Imbalance Energy pricing component. Additionally, it was only possible to review those disputes that had been processed by the date of the database snapshot – through trade date September 27, 2001. There are disputes for transactions that occurred during the refund period that are still pending, the outcomes of which will be reflected in any subsequent reruns that the ISO must undertake in this proceeding.

Q. HOW DID THE ISO APPLY THE 10-MINUTE INTERVAL AND AVERAGE MITIGATED PRICES THAT IT CALCULATED PURSUANT TO THE JULY 25 ORDER, AS PROVIDED TO THE PRESIDING JUDGE AND PARTIES IN EXHIBIT NOS. ISO-3 and ISO-4?

A. The ISO applied the 10-minute interval mitigated prices to Imbalance Energy transactions, while hourly average prices were applied to Ancillary Services capacity markets. For purposes of OOM transactions, the 10-minute interval mitigated prices were applied to OOM transactions entered

into with entities inside the ISO's Control Area, as well as to OOM transactions with entities outside of the ISO's Control Area.

Q. WITH THIS BACKGROUND ON HOW THE MITIGATED PRICE WAS APPLIED, PLEASE DESCRIBE THE PROCEDURE FOLLOWED BY THE ISO IN RERUNNING ITS SETTLEMENTS AND BILLING SYSTEM PURSUANT TO THE JULY 25 ORDER.

A. The ISO developed a multi-step process to organize the rerun of its settlements system. At the outset, however, it is important to understand that, except for the differences that I have explicitly discussed in this testimony, all data was handled in a similar manner and sequence normally followed in a standard production settlement calculation and published in the format used for standard daily settlement statements.

First, the ISO settlements staff loaded the rerun database – the "snapshot" -- and the 10-minute interval and hourly price data was re-transmitted to replace the historical Market Clearing Price, or soft cap, where applicable. Then, ISO settlements staff adjusted/readjusted as appropriate the manual adjustments and manual entries made with respect to transactions during the refund period by applying the mitigated price, where applicable. Then, the calculation algorithms in the settlement system were applied to this data in order to determine the amounts paid to sellers and charged to

buyers. Next, the ISO Settlements staff validated the results of the recalculation to ensure a zero balance and that manual adjustments had been uploaded into the recalculation. Finally, the ISO published the results of the rerun as settlement detail files. These settlement detail files are what was made available to the parties in the data disks distributed.

Q. YOU MENTIONED VALIDATION. PLEASE DESCRIBE THIS PROCESS AND EXPLAIN WHY IT WAS NECESSARY.

A. During the FERC re-run, the ISO actually performed less validation on the data than during regular, daily work. Regular daily work is subjected to multiple, comprehensive validation processes. Settlements utilizes two validation processes. One is to review data entered into the system for discrepancies in neutrality, entry date, reference description consistency, charge type applicability, and control number reviews. We also have a second validation process called "Parallel Validation." This process further ensures neutrality by assigning entry codes to all manual work. The settlement analyst performing this function verifies all entry codes are consistent and ensures they are neutral with respect to the credit and charge side of the ledger.

The reduced validation in the re-run was necessary because of the tight deliverable timeline, coupled with most settlement analysts managing

work volumes more than seven-fold their regular level. Settlements personnel performed entry calculation neutrality validations, bulk load entry validations and statement control checks as part of the FERC re-run validation process.

IV. RESULTS OF THE SETTLEMENTS AND BILLING RERUN

Q. HOW HAS THE ISO DISPLAYED THE RESULTS OF ITS SETTLEMENTS AND BILLING RERUN?

A. Settlement detail files were provided to parties by the ISO in November, 2001. These files are included with this testimony as Exhibit No. ISO-28, and corrections made to these files after the November submission are included as Exhibit No. ISO-29. Detail files are displayed as settlements statements similar to the manner in which such statements normally are provided to Scheduling Coordinators in the normal course of doing business with the ISO. However, the rerun settlement detail files are arranged in a trade date format, consolidating all activities with respect to an individual trade date on the statement for that trade date. The production (original) settlement detail files contain some information relating to other trade dates to reflect the results of any adjustments made subsequent to the issuance of statements for those trade dates.

Additionally, I have provided as Exhibit No. ISO-30 a tabular spreadsheet that aggregates the results of the rerun and indicates what the restated monthly invoices would have been had invoices been issued applying the mitigated prices, along with a sheet (Exhibit No. ISO-31) that correlates the identification numbers shown in Exhibit No. ISO-30 with the names of the Scheduling Coordinators. Exhibit No. ISO-30 shows what each Scheduling Coordinator was originally invoiced on a statement date basis using the snapshot data (i.e., the "original prices") as the invoice was actually provided in the production environment. Additionally, the spreadsheet shows what would have been originally invoiced on a trade date basis using the snapshot data. Finally, the spreadsheet shows what would have been invoiced on a trade date basis using the mitigated prices.

Q. IN THE PREVIOUS SECTION, YOU DESCRIBED A NUMBER OF KEY ASPECTS OF THE ISO'S SETTLEMENT RERUN BASED ON THE APPLICATION OF THE MITIGATED PRICE. DO THE RESULTS OF APPLYING THESE KEY ASPECTS REQUIRE ADDITIONAL EXPLANATION?

A. Yes. The ISO settlement pays participants for Imbalance Energy in three different categories, Instructed Energy at an Instructed Energy price , as-bid portions of Instructed Energy in excess of the "clearing price" and contributions of positive uninstructed energy at the Uninstructed Energy price. The latter category is payment for overproduction from resources or under-consumption of load as compared to forward schedules on a Scheduling Coordinator portfolio basis and paid through Charge Type 407. Consumers of Imbalance Energy are charged in two categories. For their negative deviations from forward schedules on a portfolio basis they are *charged* at the Instructed Energy price under Charge Type 407. For the portion paid to suppliers in excess of the incremental "clearing price," they are charged their pro-rata share of the amount paid for total system negative deviation of the amount paid in Charge Type 487. The latter allocation has been in effect only since Amendment 33 on December 12, 2000. Prior to that date, any cost of Imbalance Energy in excess of the Instructed Energy price was charged to all loads in the ISO control area

based on the ratio of a Scheduling Coordinators load to the total system load.

In Charge Type 1010, the Neutrality Adjustment, any differences from the amounts paid to suppliers and the amounts collected from consumers is charged or credited to loads based on the ratio of a Scheduling Coordinator's load to the total system load. Significant dollars can accumulate in this category when there are differences in the Instructed Energy price and Uninstructed Energy price and a substantial portion of the real-time load is being met by Uninstructed Energy production. When the application of the mitigated price eliminates or changes the difference between the Instructed and Uninstructed prices, credits or charges to Scheduling Coordinators based on their portion of the total system load will fluctuate. In the instance where a Scheduling Coordinator with little or no net negative deviation received its proportionate share of a credit in a given interval and that credit is removed from the Neutrality Adjustment, the application of the mitigated price will create the appearance of increased costs in the settlement statement that the Scheduling Coordinator receives.

Another result of the current settlement recalculation that requires additional discussion is the elimination of certain transactions from

application of the mitigated price. When the mitigated price is applied to transactions in the post-Amendment 33 Imbalance Energy allocation, and the mitigated price is less than the historical Instructed Energy price, the entire portion of the as-bid cost is eliminated. Costs associated with transactions exempt from price mitigation that exceeded the historical Instructed Energy price increase when that historical price is reduced with the application of the mitigated price. This will result in a subsequent increase in the amount of dollars allocated to a Scheduling Coordinator with a net negative deviation in the Charge Type for the costs in excess of the Instructed Energy price. This increase may not be entirely offset by the subsequent reduction of the mitigated Instructed Energy price when the Scheduling Coordinator is charged for its negative deviation at that price.

VI. AMOUNTS OWED AND OWING TO MARKET PARTICIPANTS BASED ON THE RESULTS OF THE SETTLEMENT RERUN

Q. PLEASE DESCRIBE THE ISO'S PROCESS FOR INVOICING MARKET PARTICIPANTS FOR CHARGES AND CREDITS REFLECTED IN SETTLEMENTS STATEMENTS.

A. Each month, the ISO provides Scheduling Coordinators with invoices that aggregate all of the charges and credits reflected on the settlement

statements received by that Scheduling Coordinator during that month. The invoice provides line-item detail by Charge Type as to accumulated monthly charges or credits for that Charge Type. The resultant net amount of these charges and credits indicates whether a Scheduling Coordinator is owed or owes the ISO market for that particular month.

To the extent that a Scheduling Coordinator with a "net due ISO market" invoice provided Imbalance Energy and Ancillary Services, it would have, in fact, received full credit for having provided those services as a buy-down on the ultimate amount owed by that Scheduling Coordinator.

Finally, I would like to reiterate that no attempt is made in this process to match distinct sellers of services to the purchasers of those services. Instead, charges and credits are accounted for on an aggregate basis. As I explained previously, the ISO's markets operate in a manner analogous to a "swap meet." Thus, refunds can reduce the amount owed to a Scheduling Coordinator or to the ISO, as well as having the effect of turning a Scheduling Coordinator that was a creditor to the ISO market into a debtor to the ISO market or vice versa.

Q. HOW ARE THESE INVOICES THEN PAID?

A. To the extent that a Scheduling Coordinator receives an invoice which indicates that it owes the ISO, it is obligated to make payment on a date set by ISO. Under normal circumstances, ISO distributes monies collected from such Scheduling Coordinators to those owed by the ISO market on that same date. To extent that amounts collected from "due ISO" Scheduling Coordinators are insufficient to pay "due Scheduling Coordinator" invoices for a given month, the ISO calculates a pro-rata share for each Scheduling Coordinator to which the market owed money, and provides a certification of who the defaulting parties are, and what portion of the defaulting parties' outstanding amount they have claim to. There is no separate cash clearing for individual services, but instead, there is a pool of money that is net invoiced. To the extent that there are months in which ISO cash clearing was insufficient to assure payment, it was only the Scheduling Coordinators that had "due-Scheduling Coordinator" invoices that were short-paid for services provided. As I explained previously, this is because payments for Imbalance Energy and/or Ancillary Services provided by Scheduling Coordinators that had "due ISO" invoices were netted out from the amounts owed by those Scheduling Coordinators.

Q. DID THE ISO TAKE STEPS TO ENABLE PARTIES TO DETERMINE "WHAT SUPPLIERS ARE OWED BY THE ISO, INVESTOR OWNED UTILITIES, AND THE STATE OF CALIFORNIA?"

A. Yes. The ISO has aggregated the monthly invoices of each Scheduling Coordinator, so that the Commission, Presiding Judge, and parties to this proceeding will be able to understand the existing cash positions of Scheduling Coordinators with respect to the ISO's markets. However, the ISO has not, and cannot, provide a definitive indication of exactly "what suppliers are owed by the ISO, Investor Owned Utilities, and the State of California." The ISO's relationship in the wholesale electric market is with Scheduling Coordinators who represent various entities, including the Investor Owned Utilities. For this reason, the ISO cannot determine the obligations between the Scheduling Coordinators and the parties they represent. What the ISO *can* determine and exhibit to parties in this proceeding is the relationship between Scheduling Coordinators and the ISO market. The parties reviewing the information in this proceeding can align the unpaid and undistributed monthly amounts provided in the certification to the restated monthly invoice amounts based on the recalculation of the settlement system.

Q. HOW HAS THE ISO DISPLAYED THE RESULTS OF THIS DETERMINATION?

A. The results are displayed on Exhibit No. ISO-32 in a tabular format that allows the viewer to see all monthly unpaid amounts by Scheduling Coordinators in default, and the monthly amounts owed to Scheduling Coordinators as a result of those defaults, through a certain date. For convenience, the total amounts owed by Scheduling Coordinators and the total amounts owing to Scheduling Coordinators are aggregated for the period in which there were defaults. It should be noted that these amounts will change before the date of the hearing in this proceeding.

V. CONCLUSION

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.