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UNITED STATES OF AMERICA

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

California Independent System ) Docket No. ER98-1499-000, et al.  
Operator Corporation )

PREPARED DIRECT TESTIMONY OF  
MARK MOROSKY  
ON BEHALF OF THE  
CALIFORNIA INDEPENDENT SYSTEM  
OPERATOR CORPORATION

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

A. My name is Mark Morosky and I am the Manager of Metering and MDAS Operations for the California Independent System Operator Corporation (ISO). My business address is 151 Blue Ravine Road, Folsom, California 95630.

**Q. IN WHAT CAPACITY ARE YOU EMPLOYED?**

A. As the Manager of Metering and MDAS Operations, I have three primary areas of responsibility. First, I am responsible for managing the operations of the ISO's Metering Data Acquisition System (MDAS). MDAS is comprised of several integrated computer systems that directly acquire, validate, store, and process metering data from both entities metered by the ISO and entities metered by Scheduling Coordinators. Under the ISO Tariff, Scheduling Coordinators are entities that are responsible for scheduling energy deliveries on the ISO Controlled Grid and paying the applicable charges for the transmission service. The

1 MDAS system is a secure system that is automatically integrated into the  
2 ISO's billing and settlements computer systems. All energy  
3 measurements in the ISO markets are processed through MDAS.  
4

5 Second, I am responsible for Meter Engineering functions at the ISO.  
6 Meter Engineering certifies the accuracy of the metering systems installed  
7 at all ISO Metered Entities and ensures that these systems meet the  
8 standards set forth in the ISO Tariff and Protocols. Meter Engineering  
9 also certifies third-party Meter Inspectors and administers: (1) the meter  
10 certification specifications, (2) the approval of metering system design,  
11 and (3) the metering systems records keepers.  
12

13 Third, I oversee the auditing of metering systems. The Metering Systems  
14 Auditors are responsible for auditing the metering data processing in the  
15 Schedule Coordinator Metering Systems. The primary concern in this  
16 area is to ensure that the Metered Entity Data reported to ISO by  
17 Scheduling Coordinators is indeed Settlement Quality Meter Data, as  
18 defined in the ISO Tariff and Protocols -- data that is gathered, validated,  
19 and stored in a settlement-ready format, for ISO settlement and auditing  
20 purposes. Along with field visits to the Scheduling Coordinator's facilities,  
21 this function includes validation checks of Scheduling Coordinator  
22 reported data to detect anomalies and errors.  
23

24 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**  
25 **QUALIFICATIONS.**

26 A. I hold a Bachelor of Arts in Business Economics from the University of  
27 California at Santa Barbara and a 2-year Engineering Technician  
28 certification from DeVry Institute of Technology in Columbus, Ohio.

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I was employed by Intel Corporation in the Silicon Valley as an Engineering Technician working on production issues, hardware design, and software development. After leaving Intel, I joined DataProducts Corporation as a full-time programmer on a variety of real-time software applications.

After my career in the Silicon Valley, and completing my degree in Economics, I accepted employment in the energy consulting field. Over three years, I was employed at ADM Associates and at QEI Incorporated; both firms have similar markets and are primarily concerned with consulting to electric and gas utilities. My work there was primarily focused on data analysis, end-use surveys, and software development.

In 1992, I took a position as a Senior Rate Analyst (Load Research) at the Sacramento Municipal Utility District (SMUD). After three years, I took a position in the metering department at SMUD that entailed management of the Meter Data Acquisition System and of the integrity of the data provided to other areas in the company. I served in this capacity for over two years before being hired at the ISO. At SMUD, I had overall responsibility for metering data acquisition, data processing, storage and dissemination.

For the past 19 months I have held the position of Manager of Metering and MDAS Operations at the ISO with the responsibilities described earlier.

**Q. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THIS COMMISSION?**

1 A. No. I have not testified previously before either this Commission or any  
2 State commissions.

3

4 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

5 A. As described in the Supplemental Direct Testimony of Ms. Deborah  
6 Le Vine, the purpose of this testimony is to describe the ISO's position  
7 with respect to the issues raised in the testimony of Mr. James A. Ross on  
8 behalf of the Cogeneration Association of California.

9

10 In my testimony, I will summarize the ISO's metering requirements and  
11 respond to Mr. Ross's contention that these requirements may be unduly  
12 burdensome. I will also explain how the ISO evaluates requests for  
13 exemptions from its metering requirements, and how these requirements  
14 have been applied to qualifying facilities (QFs).

15

16 **Q. PLEASE SUMMARIZE THE ISO'S METERING REQUIREMENTS.**

17 A. The ISO's metering requirements are contained in Article 10 and the  
18 Metering Protocol of the ISO Tariff. A copy of Article 10 is provided as  
19 Exhibit No. \_\_ ISO-10, and a copy of the Metering Protocol is provided as  
20 Exhibit No. \_\_\_ ISO-11. These provisions govern such issues as the duty  
21 to install and maintain meters, the responsibilities of providing meter data,  
22 metering standards and certification, metering communication systems,  
23 access to meter data, audits and testing of meters, and exemptions.

24

25 **Q. WHAT METERS ARE REQUIRED BY THE ISO?**

26 A. Any meter that has been certified as ISO compliant by a third-party  
27 Independent Meter Testing Lab will satisfy the ISO requirements.  
28 Currently, the only meter to complete the laboratory certification is the

1 Siemens Quad IV Plus Meter. Other meter manufacturers are preparing  
2 meters for independent testing and I expect that by the end of 1999 other  
3 meters will be certified for use by the ISO.  
4

5 **Q. WHY WERE THESE PARTICULAR METERS CHOSEN?**

6 A. The metering criteria were developed through a stakeholder process as  
7 part of the development of the ISO Tariff and protocols. There was a  
8 metering subgroup that developed the requirements. As stated earlier, a  
9 certification process is performed by a third-party independent laboratory  
10 to confirm that the meter meets the standards set forth in the ISO Meter  
11 Specification MTR1-96.  
12

13 **Q. WHAT COMMUNICATION SYSTEM IS USED BY THE ISO TO POLL**  
14 **METER DATA?**

15 A. ISO meters are polled directly daily with five minute metering interval data  
16 aggregated for each hour. The polling is via a private wide area network  
17 (WeNet) using protocols identical to the Internet (TCP/IP). The MDAS  
18 system uses the MV-90 software application to perform the polling, and  
19 the process is technically very similar to accessing an Internet Web Page.

20 **Q. DO YOU BELIEVE THAT COMPLIANCE WITH THE ISO'S METERING**  
21 **REQUIREMENTS REPRESENTS AN UNDUE BURDEN FOR QFs OR**  
22 **OTHER MARKET PARTICIPANTS?**

23 A. In the vast majority of instances, I believe it does not. There are four main  
24 areas where facilities may incur additional expenses to comply with the  
25 ISO's metering requirements: (1) acquisition of the approved meter,  
26 (2) installation, (3) inspection of the new meter, and (4) communications.  
27

1           The Siemens Quad IV Plus Meter costs approximately \$2,500, including  
2           the program. Installation costs will vary for different facilities. Factors may  
3           include the configuration of the unit and whether or not the generator can  
4           undertake the work itself. For facilities that rely on internal engineering  
5           resources for the electrical work, and to prepare the design documents  
6           and schematics, the costs for installation and configurations can be limited  
7           to the cost of existing engineering staff time. If a generator owner relies  
8           solely on engineering consultants, the cost may be higher, depending on  
9           the specifics of the contract. The ISO will assist in providing technical  
10          support, further decreasing installation costs.

11  
12          The ISO also requires new meter installations to undergo an independent  
13          third-party inspection by a certified ISO Metering Inspector. Costs for the  
14          inspection will vary based on the location of the generator and the  
15          complexity of the installation but should be approximately \$1,000.

16  
17          An ISO communications circuit and networking equipment are also  
18          required for full certification. The circuit and equipment lease costs  
19          approximately \$240 per month. This cost is likely to decrease as the ISO  
20          develops secure techniques to poll the meters over the Internet.

21  
22          **Q.    HAVE ANY QFs BROUGHT THEIR FACILITIES INTO COMPLIANCE**  
23          **WITH THE ISO'S METERING REQUIREMENTS?**

24          A.    Yes. Several QF facilities have brought their facilities into compliance with  
25          the ISO's metering requirements including Midway Sunset Cogeneration  
26          Company (represented by CAC), Wheelabrator Martell, Burney Forest  
27          Products, Martinez Refining, Tosco Refining, and Mount Poso.

28

1       **Q.     DID THE ISO PROVIDE ASSISTANCE TO THESE QFs, INCLUDING**  
2       **MIDWAY SUNSET COGENERATION?**

3       A.     Yes. For example, ISO Meter Engineering worked closely with one of  
4       Midway Sunset’s electrical engineers, assisting him with the  
5       documentation requirements, meter programming, and communications  
6       procurement.

7       Q.     Are there potential cost benefits from compliance with the ISO metering  
8       requirements?

9       A.     Yes. For example, the ability of polling meter data remotely will result in  
10      administrative savings for the facility by alleviating the need for manual  
11      meter reads.

12  
13      Moreover, there may be collateral benefits. For example, I am aware of  
14      the case in which the QF had an existing meter installed on the “low” side  
15      of a transformer and was being charged estimated losses of 2% to  
16      account for losses between the meter and the interconnection point. By  
17      installing the new meter on the “high” side the facility was able to  
18      demonstrate that the actual losses were only 0.7% and was able to obtain  
19      a revision to its power purchase agreement. The additional output from  
20      the lower loss factor should certainly pay for the added metering  
21      expenses.

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27      **Q.     YOU INDICATED THAT IN “MOST INSTANCES” COMPLIANCE WITH**  
28      **THE ISO’S METERING REQUIREMENTS WOULD NOT BE UNDULY**

1           **BURDENSOME. DOES THE ISO HAVE A MEANS OF GRANTING**  
2           **EXEMPTIONS FROM THE REQUIREMENTS IF THEY WOULD BE**  
3           **BURDENSOME FOR A PARTICULAR FACILITY?**

4           A.    Yes. Section 13 of the Metering Protocol of the ISO Tariff outlines a  
5           process by which applicants can request and the ISO will consider  
6           requests for either temporary or permanent exemptions from the ISO's  
7           metering requirements where compliance with the requirements would be  
8           unnecessary, impractical, or uneconomic. In addition, the ISO has  
9           developed a procedure describing how it evaluates exemption requests.  
10          This procedure is provided as Exhibit No. \_\_ ISO-12.

11  
12          **Q.    WHAT CRITERIA DOES THE ISO CONSIDER IN DETERMINING**  
13          **WHETHER OR NOT TO GRANT AN EXEMPTION?**

14          A.    In evaluating whether or not to grant an exemption, the ISO considers  
15          such factors as: (1) does the exemption request compromise the accuracy  
16          and integrity of the meter data or system; (2) does the exemption affect  
17          the speed or integrity of the communication system; (3) are the ISO  
18          requirements unnecessary, impractical, or uneconomic for the Metered  
19          Entity; and (4) whether the request is for a temporary or a permanent  
20          exemption.

21  
22          The ISO also evaluates the megawatt output and strategic importance of  
23          the generator, and plant-specific factors such as location in terms of  
24          remoteness and communication accessibility.

25  
26          Before granting an exemption, the ISO has required that the existing  
27          meter must measure bi-direction energy flows and that an independent



1 assessment of the accuracy class of the metering system must be  
2 completed.

3

4 **Q. DOES THE ISO HAVE A SPECIFIC TIME PERIOD FOR CONSIDERING**  
5 **METERING EXEMPTION REQUESTS?**

6 A. Yes. Section 13.3 of the Metering Protocol of the ISO Tariff requires that  
7 the ISO confirm receipt of an application for an exemption within three  
8 business days and decide whether or not to grant the exemption within  
9 forty-five business days (unless the ISO makes a request for additional  
10 data more than forty days after the application, in which case the ISO  
11 must render a decision seven days after receiving the data). I would note  
12 that the ISO has generally taken far less than the forty-five days to act on  
13 these applications.

14

15 I would also note that under section 13.2 of the ISO Tariff, the ISO must  
16 promptly publish on its home page details of whether the application was  
17 approved or rejected.

18

19 **Q. HAVE ANY QFs REQUESTED AN EXEMPTION FROM THE ISO'S**  
20 **METERING REQUIREMENTS?**

21 A. Yes. One of the projects represented by CAC, Texaco's North Midway  
22 Cogeneration unit, has requested and been granted a temporary  
23 exemption from ISO Metering Communications requirements.

24

25 **Q. WHY DID TEXACO'S NORTH MIDWAY COGENERATION UNIT**  
26 **REQUIRE AN EXEMPTION?**

27 A. The communications demarcation point is a significant distance from the  
28 metering facility at this site. An exemption has been granted for the

1 generator owner to explore alternative communications methods for the  
2 distance from the demarcation point to the meter (i.e. cell phone, packet  
3 radio, analog modem, etc.).  
4

5 **Q. WHAT OTHER FACILITIES HAVE RECEIVED EXEMPTIONS FROM**  
6 **THE ISO'S METERING REQUIREMENTS?**

7 A. A list of all metering exemptions granted by the ISO is provided as Exhibit  
8 No. \_\_ ISO-13.  
9

10 **Q. HAS THE ISO REFUSED TO GRANT REQUESTED EXEMPTIONS?**

11 A. To date ISO has not refused to grant any exemptions. Thus far, all  
12 exemptions granted are temporary and considered interim solutions until  
13 such time as the metered entity can bring the facility into full compliance.  
14

15 **Q. HAVE THE EXEMPTED FACILITIES PLACED ADDITIONAL BURDENS**  
16 **ON THE ISO?**

17 A. Yes. Facilities that are not in compliance with the ISO's metering  
18 requirements and which the ISO cannot poll remotely through its MDAS  
19 system strain the ISO in several ways. Most significant is that the  
20 metering data must be regularly taken manually by the facility and then  
21 manually entered by the ISO into its settlement system. Manual entry  
22 requires additional administrative resources and increases the probability  
23 of poor quality data including spikes and missing data which requires the  
24 ISO to perform estimating and load profiling.  
25

26 If the facility fails to read the meter accurately or misses an hourly  
27 measurement, there is a need to allocate the power output over the period  
28 of the missed readings. Given that the ISO runs hourly markets and that

1           the prices can vary between on-peak and off-peak conditions or even  
2           hour-by-hour, the ability to ensure timely and accurate meter data is of  
3           great importance.

4

5           **Q.    THANK YOU. I HAVE NO FURTHER QUESTIONS.**