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Decision 99-03-021 March 4, 1999

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of San Diego Gas & Electric Company for Authority to Revise Line Loss for Energy Payments to Qualifying Facilities.	Application 98-06-045 (Filed June 23, 1998)

ORIGINAL

(See Attachment 1 for List of Appearances.)

FINAL OPINION

Summary[1]

We deny the request of San Diego Gas & Electric Company (SDG&E) to modify transmission line loss adjustment factors at this time. SDG&E has not demonstrated that these factors no longer reflect avoided line losses on its system, or that the generator line loss multipliers of the Independent System Operator (ISO) are more appropriate to use for short-run avoided cost calculations.

We approve SDG&E's proposal to modify its distribution line loss adjustment factors at this time. SDG&E's proposal is supported by the results of a study of distribution losses on its system.

[1] Attachment 2 explains each acronym or other abbreviation that appears in this decision.

Background

Utilities purchase power from qualifying facilities, or "QFs," at prices designed to reflect the costs avoided by the utility because of the presence of the QF.[2] Transmission loss factors (TLFs) and distribution loss factors (DLFs) are used to adjust energy payments to QFs to reflect line losses, either avoided or incurred by the utility, as a result of purchasing power from a QF. Line losses occur because there is some loss of energy over power lines as power travels from the generator to the load.

A TLF or DLF greater than 1.0 implies that the utility avoids line losses when it purchases energy from a QF, relative to producing its own power or purchasing power from elsewhere. Conversely, a TLF or DLF less than 1.0 implies that the presence of QFs causes the utility to incur greater line losses. (Reporter's Transcript (RT) at 10-11, 57; Exhibit (Exh.) 1, p. 3.)

SDG&E's current line loss factors were adopted in Decision (D.) 84-03-092. The average TLF currently in effect for SDG&E is 1.025. The average DLF in effect for SDG&E is 1.06. The DLF of 1.06 includes both transmission and distribution line losses.

On June 23, 1998, SDG&E filed a motion and application requesting immediate, ex parte authorization to revise its current TLFs and DLFs. In its filing, SDG&E argues that immediate revisions to these factors are needed due to the commencement of ISO and Power Exchange (PX) operations on March 31, 1998. SDG&E requests that the Commission authorize SDG&E to use the ISO-

[2] A QF is a small power producer or cogenerator that meets federal guidelines and thereby qualifies to supply generating capacity and electric energy to electric utilities. Utilities are required to purchase this power at prices approved by state regulatory agencies.

calculated generator line loss multipliers in place of existing TLFs. In addition, SDG&E requests approval of new DLFs based on a recently completed SDG&E study.

Nutrasweet Kelco Company, Independent Energy Producers (IEP), California Cogeneration Council (CCC) and Monsanto Company (Monsanto) protested SDG&E's motion and application. These parties argued that SDG&E's application raised factual issues that should be explored in evidentiary hearings. CCC, IEP and Monsanto also argued that line loss factors should not be addressed in this proceeding. Rather, line losses should be considered as part of a statewide proceeding to evaluate the transition from current short-run avoided cost pricing to QF pricing based on the PX clearing price, pursuant to Public Utilities (PU) Code Section 390.

Among other things, PU Code Section 390 establishes that short-run avoided cost payments to QFs (i.e., payments for as-available energy and capacity) will be based on the clearing price paid by the PX. First, however, the Commission must determine that the PX is functioning properly for these purposes. That determination has not yet been made.

By ruling dated July 10, 1998, the Assigned Commissioner denied SDG&E's motion for immediate, ex parte authorization of new line loss factors and scheduled a prehearing conference for July 29, 1998. At the prehearing conference, the Assigned Commissioner ruled in favor of protestants on the need for evidentiary hearings. However, the Assigned Commissioner declined to defer consideration of SDG&E's application, as requested by CCC/IEP/Monsanto, noting that the timetable for the consideration of PU Code Section 390 issues was open-ended. Instead, the Assigned Commissioner determined that the inquiry into SDG&E's line loss factors should proceed at this time.

SDG&E filed supplemental direct testimony on August 10, 1998. Intervenor testimony was filed by Southern California Edison Company (SCE) and jointly by CCC/IEP/Monsanto. Evidentiary hearings were held on October 19 and 20, 1998. The Assigned Commissioner presided with the Assigned Administrative Law Judge at the prehearing conference and attended one day of evidentiary hearings on October 19, 1998. Concurrent opening briefs were filed on November 13 by SDG&E, SCE, CCC, IEP, and Monsanto. Concurrent reply briefs were filed on November 23, 1998 by SDG&E, CCC and Monsanto.

Issues

As directed by the Assigned Commissioner, the issues to be addressed in this proceeding[3] are:

1. Whether SDG&E's current TLFs and DLFs no longer reflect the realities of the system;

2. Whether it is appropriate for SDG&E to adopt the ISO's line loss factors for use in calculating payments to QFs. If so, whether SDG&E should adopt factors at this time that have been approved only on an interim basis by the Federal Energy Regulatory Commission (FERC), and may be updated at the beginning of next year;

3. Whether SDG&E's internal study supports the revision of its DLF to 1.0.

4. Whether other factors exist that affect the line loss factors that should be reflected in SDG&E's payments to QFs.

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[3] See Assigned Commissioner's Scoping Memo and Ruling Applying Article 2.5, Senate Bill 960 Rules and Procedures, dated August 31, 1998.

Positions of the Parties

SDG&E's application requests authority to implement two changes to the line loss adjustment factors used in calculating payments to QFs. First, SDG&E requests authority to replace its existing TLFs with the Generator Meter Multipliers (GMMs) that have been proposed by the ISO and approved by the FERC to calculate line losses at each ISO grid injection point. The GMMs for SDG&E's transmission-level QFs for the month of April 1998, ranged from 0.98 to 1.01, depending on the QF and hour of the day. (Exh. 5, Attachment B.) Second, SDG&E requests authority to replace its existing DLFs with a uniform DLF of 1.0.

SDG&E's proposal, if adopted in its entirety, would reduce short-run avoided cost payments to QFs by approximately 6%. (RT at 201.) With respect to transmission line loss adjustments, SDG&E's proposal also represents a departure from the Commission's existing premise that QF energy purchases cause SDG&E to avoid transmission losses. Using GMMs to adjust QF energy payments would reverse this determination for some QFs on its system.

In support of its request for replacing TLFs with GMMs, SDG&E argues that the current TLFs are outdated and that GMMs reflect current line loss impacts of QFs on the system. Replacing TLFs with GMMs is necessary now, according to SDG&E, to ensure that the line loss adjustments in SDG&E's energy payments to QFs correspond with the line loss adjustments in the PX payments to SDG&E. SDG&E contends that continuing to use TLFs in calculating QF payments is unlawful because "...SDG&E will pay QFs more than it receives from the PX—more than SDG&E's avoided costs."[4] SDG&E estimates that continued use of the TLFs to adjust QF payments will exceed the line loss

[4] Exh. 1, p. 17; see also, Exh. 2, p. 2; Exh. 6, p. 6.

adjustments in SDG&E's ISO/PX revenues by more than $1 million per year, thereby increasing SDG&E's transition costs. (Exh. 1, pp. 4, 7.)

With regard to distribution transmission losses, SDG&E argues that its recent line loss study supports the adoption of a weighted average DLF of 1.0. In addition, SDG&E contends that continuing with the current DLF results in double counting of transmission level line losses in the PX payments to SDG&E for distribution level QFs. This is because the PX pays SDG&E an amount equal to the reported QF generation as adjusted for both DLFs and GMMs. Since current DLFs include transmission losses, the PX formula adjusts payments to SDG&E twice for these losses.

SCE supports SDG&E's position on all issues.

CCC, IEP and Monsanto oppose SDG&E's application. They contend that using GMMs to calculate SDG&E's energy payments to QFs would violate the principles of avoided cost that must be adhered to in determining SDG&E's payments to QFs. In particular, they argue that SDG&E has failed to demonstrate that (1) its existing TLFs do not reflect SDG&E's avoided line losses and (2) GMMs do reflect line losses that SDG&E avoids by purchasing electricity from QFs. These parties also argue that adopting the GMMs before energy payments to QFs are based on PX prices would distort QF prices. In addition, CCC contends that Section 390 of the PU Code prohibits SDG&E from basing its avoided cost energy payments to QFs upon the PX market until the statutory prerequisites in Section 390 are satisfied.

With respect to SDG&E's proposal to modify DLFs, Monsanto argues that SDG&E's new study does not reflect an adequate analysis of avoided distribution losses on its system. In particular, Monsanto argues that the study is flawed because it (1) does not take account of all QFs on SDG&E's system, (2) evaluates losses on an individual QF-in/QF-out basis, instead of on a system basis, (3) does

not factor replacement energy for QF production into the QF-out analysis, and (4) does not provide for any adjustments to line loss factors based upon changes in system conditions. In addition, Monsanto argues that SDG&E's methodology uses conversion factors and averaging methods that result in inappropriate reductions to QF payments. Finally, Monsanto contends that ratepayers are indifferent to SDG&E's proposal, because the reduction in SDG&E's payments to QFs will result in a corresponding reduction in payments by the PX to SDG&E.

Discussion

This Commission has long recognized that determining the impact of QFs on line losses is a difficult and complex process. In early 1982, we ordered utilities to include in their payments to QFs the line loss costs or savings associated with QF purchases. We directed them to make this calculation by considering the impact of QFs on their system in the aggregate, with one exception. For remote QF projects one megawatt or larger, losses from such QFs were to be examined individually. (D.82-01-103, 8 CPUC 2d 20, at 45, Ordering Paragraphs 6.d. and 8.e.)

When it came to calculating these costs or savings, however, the difficulty of the task became apparent. In D.82-12-120, we noted the paucity of utility line loss studies to date and determined for the time being to adopt a loss factor of 1.0 to be applied by all utilities for all QF energy. We also determined that adjustments for remote QFs were not then practicable, and we suspended that exception pending utility study of how to identify such QFs and to reflect a different energy loss rate. We rejected a PG&E suggestion that individual line losses be established, instead affirming our prior decision to analyze QF line losses in the aggregate. (D.82-12-120, 10 CPUC 2d 533, 625.)

SDG&E prepared a new line loss study in October 1992 and petitioned the Commission to modify D.82-12-120 in light of the study results. In its study, SDG&E calculated the marginal line loss factor for its system and assumed that all of the marginal line losses would be avoided by the operation of QFs. (RT at 43, 57, 84.) Similarly, SCE prepared a study of line losses based on its marginal loss factor, and petitioned the Commission for consideration of the results.

We approved SDG&E's and SCE's modified line loss factors in D.84-03-092, issued on March 21, 1984. For SDG&E, we adopted line loss adjustment factors that average approximately 1.025 and 1.06 for transmission level and distribution level QFs, respectively. The DLF of 1.06 includes both transmission and distribution line losses. The line loss adjustment factor of 1.0 continues to apply to PG&E.

In approving these factors, we stated:

> "The factors currently in place are reasonable, but only for the interim. When these factors are improved or revised to more accurately reflect the utilities' avoided costs, however, they will properly be used in calculating the energy payments of all QFs under contract with the utility..." (D.84-03-092, mimeo., p. 38.)

> "Our decision reflects the inconclusiveness of the record on line losses and our struggle to develop an appropriate interim solution until the line loss studies required of all three utilities are completed, reviewed, and approved." (*Id.*, p. 37.)

Consistent with our direction in D.82-12-120, SDG&E filed a subsequent line loss study on June 1, 1984. However, we never addressed SDG&E's 1984 line loss study. In D.88-09-026, in what we referred to as the "consolidated standard offer proceeding," we responded to requests to address the utilities' updated line loss studies, as follows:

> "We see little benefit at this time to refining the treatment of line losses in our established methodology for pricing energy from existing QFs, or even future QFs under the short-run standard offers. Not only are the studies old and likely to need revision, but also the issues involved in making line loss adjustments for such QFs are complex, and there is no guarantee that after wrestling with these issues, we would emerge with significantly improved price signals to QFs." (D.88-09-026, 29 CPUC 2d 263, 284.)

In reaching this conclusion, we noted again the complexity associated with determining whether QFs increase or decrease line losses on the utility's system:

> "Many issues would have to be resolved to answer these questions precisely. We would have to consider, for example, QFs' proximity to the utility's load centers and the characteristics of the utility's transmission system. We would also have to decide whether to predicate the answers on analysis of the aggregate impact of QFs, or whether a project-specific line-loss methodology is necessary or desirable." (*Ibid.*)

In the application before us, SDG&E requests that we modify its line loss adjustment factors based on what it considers to be updated, more accurate information. As discussed in the Assigned Commissioner's Ruling dated August 31, 1998, the threshold issue before us is whether the current line loss adjustment factors no longer reflect avoided line losses on SDG&E's system. If they do not, then we must determine whether SDG&E's proposed replacements for those factors are reasonable.

Before turning to the specific issues, we affirm the Assigned Commissioner's ruling at the prehearing conference that CCC appears to reargue in its opening brief. Specifically, CCC asserts that SDG&E cannot adjust its TLFs to equal GMMs because the statutory prerequisites in PU Code Section 390 have not been satisfied. We disagree. PU Code Section 390 is silent on the issue of line loss adjustments to energy payments. It refers exclusively to "the commission's prescribed short-run avoided cost energy methodology," which we have

developed separately from our methodology to determine line loss adjustment factors. Based on the plain meaning of the statute, we conclude that Section 390 does not preclude us from updating our current methodology for line loss adjustment factors by considering the use of GMMs (or any other methodology) as a replacement to TLFs.

Transmission Line Losses

Because so much time has elapsed since the adoption of current TLFs, SDG&E argues that they are outdated and need to be modified. To support this argument, SDG&E itemizes the facility expansions and changes that it has made since 1984 and discusses how each change increases or decreases line losses on its transmission lines. (Exh. 4.)

SDG&E's itemization of changes to its transmission system, while interesting, is nonetheless inconclusive. SDG&E fails to correlate the physical changes on its system with changes in line losses in the aggregate, either qualitatively or by conducting a study to examine that correlation quantitatively. In fact, SDG&E admits that it cannot draw any conclusions about whether SDG&E's purchases from QFs cause SDG&E to incur or avoid line losses to a greater or lesser degree than they did in 1984. (RT at 12-15, 53.)

The other argument that SDG&E makes in support of its proposal is based on its observation that the ISO utilizes GMMs to settle deliveries of electricity made through the ISO/PX market. Because GMMs are used to adjust payments made by the PX to SDG&E for power generated by its QFs, SDG&E argues that GMMs must also be used to adjust payments made by SDG&E to its QFs. In making this argument, SDG&E equates the payments it received from the PX with its avoided costs. (Exh. 1, p. 17.)

This second argument is flawed because it is inconsistent with avoided cost principles. Federal law defines avoided costs for purposes of calculating payments pursuant to the Public Utilities Regulatory Policies Act as "the incremental costs to an electric utility of electric energy or capacity or both which, but for the purchase from qualifying facility or facilities, such utility would generate itself or purchase from another source."[5] Therefore, avoided cost is not measured by what utilities are paid when they sell energy, but instead by what they must spend to produce or procure energy in the absence of QFs. The record clearly establishes that the PX only uses the GMMs to adjust payments to sellers of energy; the GMMs are not applied to payments owed to the PX by purchasers of energy. (Exh. 13, p. 11; RT at 28-29.)

During cross examination, SDG&E counsel created a set of equations to attempt to demonstrate that a GMM adjustment is implicit in the price paid by SDG&E for energy purchased from the PX. (Exh. 14; RT at 161-176.) The theory underlying these equations is that SDG&E's avoided cost is determined by figuring out how much demand the ISO deems to be served by SDG&E's QFs, and then calculating what it would cost to serve that demand with energy purchased from the PX. SDG&E pursues this theory in its opening brief by arguing that SDG&E's avoided cost equals the PX price times a quantity equal to the "load capable of being served by the QF." (SDG&E Opening Brief, p. 30.) SDG&E concludes that "it is the PX price, therefore, multiplied times the energy as adjusted for GMMs, that represents SDG&E's avoided cost." (*Id.* at 31.)

[5] 18 C.F.R. Section 292.101(b)(6).

We agree with CCC and Monsanto that there is no factual basis in the record for SDG&E's theory and, in fact, it defies common sense. As witness McClary explains, if SDG&E were to purchase power in the absence of a particular QF or all QFs on its system, it would be purchasing power from a wide variety of sources, producing at many points, that are also submitting into the PX. (RT at 169-170, 179.) In contrast, SDG&E's equations assume that SDG&E would purchase more or less energy depending upon whether the QF increases or reduces line losses on the system. (Exh. 14.) SDG&E does not present any evidence to support this assumption, nor do we find it credible based on our understanding of the market.

Even if GMMs were implicit in the calculation of payments made by SDG&E to the PX, we are not convinced that they are a reasonable replacement for current TLFs from a methodological standpoint. This is because the methodology used to derive GMMs may not take accurate account of the reliability needs within SDG&E's service territory.

As explained in this proceeding, GMMs are calculated using a power flow model that simulates the entire ISO transmission grid. The model is run to determine what transmission line losses would be if there were an additional increment of power produced at each interconnection point. An implicit assumption in the calculation of GMMs is that demand is proportionately spread throughout the ISO grid, i.e., that an additional increment of QF generation is meeting an increment of demand spread throughout the state. (Exh. 5, pp. 4-5; RT at 44-45, 187-189.)

CCC points out why this assumption may not result in an accurate measure of marginal line losses for the purpose of assessing the impact of QFs on SDG&E's system:

> "Looked at another way, GMMs currently are calculated based upon the assumption that generators, in this case SDG&E's QFs, are serving load throughout California. Given the need in the San Diego service territory for local generation to address reliability needs, it may be more appropriate to assume that SDG&E QFs serve SDG&E load. If indeed SDG&E QFs were serving SDG&E load, it is likely that the transmission losses would be less (or benefits greater) than if SDG&E QFs were serving load distributed throughout the ISO grid. Thus, GMMs do not reflect the losses avoided by local QF generation given SDG&E's reliability needs." (Exh. 13, p. 12.)

In addition, we note that the FERC concerns in approving the ISO's use of current GMMs based on its own observations about their accuracy:

> "We do not know at this point how significantly the ISO's proposal for calculating Transmission Losses would differ from a full marginal cost price signal. The record has little information on the magnitude of marginal Transmission Losses in California, how substantially marginal Transmission Losses vary depending on conditions such as transmission direction and distance and line loadings, and how substantially the ISO's proposed calculations would differ from actual marginal Transmission Losses." (81 FERC paragraph 61,122, October 30, 1997, mimeo., at 180.)

Because of its concerns, FERC approved the ISO's proposal on an interim basis only. FERC directed the ISO to conduct a study comparing the GMM methodology with other approaches by January 1, 1999, at which time FERC plans to reevaluate the ISO's proposal for transmission losses. (*Id.*, mimeo., at 181.)

With regard to transition costs, we note that SDG&E's calculation of those costs assumes that prices paid to QFs under our current short-run avoided cost methodology are identical to the PX price. This is an unrealistic assumption. In reality, the price paid under our short-run avoided cost methodology is based on a formula that is not tied to the PX price and that uses an entirely different

methodology. (RT at 22-24, 183.) Therefore, there is no reason to believe that these two prices will be equal, except by pure coincidence.

As long as short-run avoided cost prices differ from PX prices, SDG&E's calculation of projected transition costs is not a valid estimation. The TLFs and GMMs are merely multipliers that increase or reduce the underlying energy payments. Even if the TLFs equal the GMMs, SDG&E's transition costs or credits, including any cost or credit that is attributable to transmission losses, will vary with changes in the PX price or short-run avoided cost price. This was clearly illustrated using equations developed during redirect examination of CCC's witness McClary. (RT at 32-33, 39-40, 181-183; Exh. 15.)

We conclude that SDG&E's calculation of projected transition costs attributable to line losses is not a useful illustration of potential transition costs. The more useful number can be calculated only be comparing projected PX payments (adjusted by GMMs), with projected short-run avoided cost payments (adjusted for TLFs). SDG&E has not performed this comparison. In any event, for the reasons stated above, SDG&E's transition cost argument does not support approval of its application.

In sum, SDG&E has failed to demonstrate that current TLFs no longer reflect avoided line losses on its system and that the ISO's interim GMMs are a more appropriate measure of those losses.

Distribution Line Losses

In its application, SDG&E describes the changes to its distribution system that it believes would affect distribution losses and, accordingly, the impact of distribution-level QFs on those losses. In addition, SDG&E explains that it can now measure and model the impacts of distribution-level QFs on line losses, using improved modeling and more sophisticated circuit load monitoring techniques. In contrast, in its 1982 study, SDG&E could not isolate losses

associated with distribution-level QFs; rather it produced DLFs that reflected both transmission and distribution losses. (Exh. 1, Chapter II, pp. 3-6.)

SDG&E prepared a new study to support its argument that current DLFs are outdated. SDG&E used its Power System Simulator for Utilization model to simulate distribution circuit losses attributable to QFs connected to the distribution system. Simulations were run for all QFs in SDG&E's service territory rated at 1 megawatt (MW) or greater. The circuit loads used for the simulations were based on the actual distribution circuit peak loads monitored in 1997. A total of 16 distribution circuit simulations were run for each circuit with a QF connected to it. For each of the four time-of-use (TOU) periods within each season (summer-winter), one simulation was run with the QF operating at rated output, and a second simulation was run with the QF "off" (zero output). The change in losses between the two cases was defined as the incremental loss due to the operation of a particular QF. These incremental losses were then adjusted by a conversion factor to compensate for the time variance of circuit losses. The results were used to determine the DLFs associated with each individual QF, calculated for each TOU period within each season.

Next, a total DLF for each QF was determined by weighing the eight calculated TOU DLFs (4 TOU periods x 2 seasons) by how many hours each TOU period occurs each year. The individual QF weighted-average DLFs ranged from 0.9605 to 1.0222. The weighted average DLFs for all QFs combined, by TOU period, ranged from 0.9973 to 1.003. The overall DLF for all QFs combined, for all TOU periods, was calculated as 1.0003. Based on this overall DLF, SDG&E proposed to set its DLF at 1.0. (Exh. 3, p. 6.)

As described above, Monsanto argues that SDG&E's study is inadequate and flawed. We have reviewed Monsanto's criticisms, and find that SDG&E has responded convincingly to each point.

In particular, Monsanto presents no basis for its argument that SDG&E should have conducted an aggregate QF-in/QF-out analysis to determine distribution losses. Although an aggregate approach was used in the 1982 study, in D.88-09-026 we left open the issue of whether to measure line losses on an aggregate QF basis or project-specific basis in the future. (D.88-09-026, 29 CPUC 2d 263, 284.) In this case, the record supports a QF-specific approach because distribution losses associated with the operation of distribution-level QFs can only be determined by performing individual QF studies per circuit. (RT at 79, 85.) Moreover, this approach does not distort the cumulative impact of QFs on the system because the operation of a distribution-level QF does not affect the line losses on a different circuit. (*Id.*at 79.) We also agree with SDG&E that this analysis does not depend upon, or require, a determination of SDG&E's source of energy in the absence of QFs. (SDG&E Reply Brief, pp. 19-21.)

Monsanto also criticizes SDG&E's study because, in its opinion, SDG&E did not performed the study on a "dynamic" basis. (Monsanto Opening Brief, p. 18.) In its brief, Monsanto attempts to define this term as "a type of analysis of variable, interdependent factors which the FERC indicates is a necessary predicate to accurately determining line losses," but this is not the way the term is defined anywhere on the record. In fact, Monsanto's expert witness neither raised this issue or defined the term in his testimony. Rather, as SDG&E witness McKenna explained during cross-examination, a "dynamic" approach means that the loss factors are adjusted on an hourly basis. (RT at 66.)

McKenna went on to explain that SDG&E would have to retrofit each of its affected distribution circuits with specialized, hourly meters in order to duplicate the ISO approach of allocating line losses to each QF. (RT at 67.) Instead, SDG&E developed DLFs by (1) measuring losses by TOU period and by season, and then (2) adjusting them using conversion factors that were based on hourly loads. (RT

at 81; Exh. 3, p. 7; Exh. 7, p. 2.) We believe that SDG&E's approach represents a reasonable balancing between precision and cost-effectiveness in developing line loss adjustment factors.

Monsanto also criticizes SDG&E's study because it did not examine the line losses associated with all QFs on its system. We note, however, that SDG&E's 20 distribution level QFs rated at or above 1 MW, including Monsanto's QF, represent 95% of the energy produced by distribution level QFs. (RT at 60.) Sample sizes are often less than 100% of the representative population, and we believe that SDG&E's decision to look at all but 5% of its distribution-level QFs is a reasonable one.

In addition, Monsanto objects to the approach that SDG&E uses to convert incremental losses calculated at the TOU period peak level into average losses over the entire TOU period. Monsanto asserts that SDG&E used a "load factor squared" approach that, in Monstanto's view, is guaranteed to provide lower line loss estimates. (Exh. 13, p. 14.) However, SDG&E's rebuttal and response to cross-examination clearly establishes that SDG&E did not calculate the load factor for each TOU period and then square it to find the loss factor, as Monsanto contends. Instead, SDG&E used a direct approach, consistent with the method illustrated in the Westinghouse Electric Utility Engineering Reference Book, to convert the incremental losses calculated at the TOU peak load level into average losses over the entire TOU period. (Exh. 3, pp. 7-8.) While this approach may result in conversion values closer to "load factor squared" than would be the case under the approximation method that Monsanto prefers, it does not follow that SDG&E's approach is biased. In fact, the direct approach produces more accurate conversion factors because it relies on actual hourly system load data. In contrast, the approximation method preferred by Monsanto is simply that: a

method that approximates loss factors using a load factor formula. (Exh. 3, pp. 7-8; Exh. 7, pp. 1-2; RT at 80-81.)

Monsanto also objects to SDG&E's proposal to employ a weighted average DLF of 1.0 for all QFs, for all time periods. In particular, Monsanto argues that a single DLF factor for all TOU periods fails to capture greater line loss reduction benefits provided during peak hours, and therefore results in inappropriate reductions to QF payments. As SDG&E acknowledges, this criticism would be valid in situations where DLFs vary significantly from one TOU period to another. (Exh. 7, p. 4.) However, SDG&E's weighted TOU period DLFs vary less than 0.6% between the highest and lowest, and are all close to 1.0. (Exh. 7, p. 4; Exh. 2, Table 3.) The difference in payments to QFs is also correspondingly small: using a 1.0 average DLF versus QF-specific DLFs results in total payment reductions of approximately $5,500. (Exh. 2, Table 3.) We agree with SDG&E that these very small differences do not justify the administrative burden of using individual loss factors.

Finally, Monsanto's observation that SDG&E's proposed change to DLFs does not affect ratepayer costs is correct, but not relevant to the issue of whether DLFs should be updated based on more recent line loss information. We find that SDG&E has demonstrated that current DLFs are outdated and that an average DLF of 1.0 more accurately reflects the line loss impact of distribution-level QFs on SDG&E's system. We therefore adopt SDG&E's proposal to set its DLF to 1.0, for all QFs and TOU periods.

However, as noted above, the average DLF currently in effect for SDG&E includes both transmission and distribution line loss adjustments. In response to questions from the assigned ALJ, SDG&E Witness Michael Strong described the appropriate method for capturing the combined effect of transmission and distribution line losses on energy payments to distribution-level QFs, should the

Commission adopt SDG&E's proposed DLF of 1.0, but not SDG&E's proposal to use GMMs. Specifically, the short-run avoided cost payment to these QFs should be multiplied by the product of the TLF currently in effect (which is approximately 1.025 on average) and the new DLF of 1.0. (RT at 49-50.)

Response to Comments on ALJ's Proposed Decision

Pursuant to PU Code Section 311 and to our governing Rules of Practice and Procedure (California Code of Regulations, Title 20, Rules 77 to 77.5), the proposed decision of Administrative Law Judge Gottstein was issued before today's decision. SDG&E, CCC, SCE and Monsanto filed timely comments to the proposed decision, and SDG&E, CCC and Monsanto filed reply comments.

We have carefully considered the comments and do not make any changes to the ALJ's proposed decision, except to clarify that the average transmission level line loss factor of 1.025, which is currently in effect for SDG&E, applies to the calculation of short-run avoided cost payments to QFs who are connected to SDG&E at the distribution level. In addition, nothing in this decision precludes any party from bringing up methodological proposals related to line losses, including those considered in this proceeding, in the PU Code § 390 proceeding opened to pursuant D.99-02-085.

Findings of Fact

1. PU Code Section 390 is silent on the issue of line loss adjustment factors to avoided cost energy payments and refers only to the Commission's short-run avoided cost energy methodology, which has been developed separately from line loss adjustment factors in the past.

2. SDG&E presented no evidence in this proceeding to correlate the physical changes on its transmission system with either changes in line losses in the aggregate, or with changes in the line loss impact of QFs on its system.

3. It is inconsistent with avoided cost principles to equate PX payments to a utility for QF power with the avoided cost that the utility must pay QFs.

4. Avoided cost is not measured by what utilities are paid when they sell energy, but instead by what they must spend to produce or procure energy in the absence of QFs.

5. GMMs are not applied to payments owed to the PX by purchasers of energy. The PX only uses the GMMs to adjust payments to sellers of energy.

6. The power purchased by a utility in the absence of QFs is produced from a wide variety of sources submitting power into the PX, each producing at many points in the system. There is no factual basis for SDG&E's theory that a utility purchases more or less energy from the PX depending upon whether QFs increase or decrease line losses on the system. Therefore, there is no basis for SDG&E's assertions that the GMMs used to adjust payments to utilities for QF power are used implicitly in the payments the utility makes to the PX for replacement power.

7. The methodology used to derive GMMs spread demand proportionately throughout the ISO grid. This approach may not accurately measure marginal line losses on a utility system (e.g., SDG&E) for the purpose of assessing the impact of QFs. Because local generation may be needed to address reliability needs, it may be more appropriate to assume that SDG&E QFs serve SDG&E load, i.e., that more than proportionate demand for SDG&E's QF power should be allocated to the SDG&E service territory. This would change the GMMs and, most likely, reduce transmission losses associated with SDG&E's QFs.

8. The GMM methodology currently in place and approved by FERC was adopted on an interim basis until the methodology could be further studied and compared with other approaches for measuring marginal transmission losses.

9. SDG&E's calculation of transition costs associated with continued use of the current TLFs assumes that short-run avoided cost prices are equal to the PX price. However, the price paid under the Commission's short-run avoided cost methodology is based on a formula that is not tied to the PX price and that uses an entirely different methodology.

10. As long as short-run avoided cost prices differ from PX prices, even if TLFs were set equal to GMMs, transition costs or credits will vary with changes in the PX price or short-run avoided cost price. Even the transition cost or credit attributable to transmission losses will vary, since TLFs and GMMs are merely multipliers that increase or reduce the underlying energy payments.

11. To update DLFs, SDG&E prepared a new study that simulated distribution circuit losses attributable to QFs connected to its distribution system.

12. A QF-specific approach to measuring distribution losses is appropriate because distribution losses associated with the operation of distribution-level QFs can only be determined by performing individual QF studies per circuit. This approach does not distort the cumulative impact of QFs on the system because the operation of a distribution level QF does not affect the line losses on a different circuit; nor does it require a determination of SDG&E's source of energy in the absence of QFs.

13. SDG&E cannot adjust loss factors on an hourly basis, as the ISO does, unless it retrofits each of its affected distribution circuits with specialized hourly meters. Instead, in reaching an appropriate balance between precision and cost-effectiveness, SDG&E approximated the ISO's "dynamic approach" by (1) measuring losses by TOU period and by season and then (2) adjusting them using conversion factors based on hourly load factors.

14. SDG&E examined the line losses associated with QFs representing 95 % of the energy produced by distribution-level QFs, including Monsanto.

15. SDG&E used a direct approach to develop conversion factors, consistent with the industry reference manual, that produces more accurate conversion factors than the approach that Monsanto prefers.

16. The weighted TOU period DLFs in SDG&E's study vary less than 0.6% between the highest and lowest, and are all close to 1.0.

Conclusions of Law

1. PU Code Section 390 does not preclude this Commission from considering updates to TLFs, including the replacement of TLFs with ISO-developed GMMs.

2. SDG&E has failed to demonstrate that current TLFs no longer reflect avoided line losses on its system and that the ISO's interim GMMs are a more appropriate measure of those losses.

3. SDG&E has demonstrated that current DLFs are outdated and that it is reasonable to replace current DLFs with a DLF of 1.0 for all QFs and TOU periods.

4. In order to update DLFs as soon as possible, this order should be effective today.

5. Because this decision addresses all issues raised by SDG&E's application, this proceeding should be closed.

FINAL ORDER

IT IS ORDERED that:

1. The June 23, 1998 application of San Diego Gas and Electric Company (SDG&E) is approved, in part. Specifically, only SDG&E's proposal to update current distribution line loss adjustment factors (DLFs) for SDG&E's energy payments to qualifying facilities is approved. SDG&E is authorized to apply a DLF of 1.0 to energy payments to all qualifying facilities, for all time-of-use periods and seasons. This change shall begin with the next short-run avoided cost posting following the effective date of this order. All other aspects of SDG&E's application are denied.
2. This proceeding is closed.

This order is effective today.

Dated March 4, 1999, at San Francisco, California.

RICHARD A. BILAS
President
HENRY M. DUQUE
JOSIAH L. NEEPER
Commissioners

I will file a written concurrence.

/s/ JOSIAH L. NEEPER
Commissioner

ATTACHMENT 1

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(END OF ATTACHMENT 1)

ATTACHMENT 2

LIST OF ACRONYMS AND ABBREVIATIONS

CCC	California Cogeneration Council
D.	Decision
DLFs	Distribution Loss Factors
Exh.	Exhibit
FERC	Federal Energy Regulatory Commission
GMMs	Generator Meter Multipliers
IEP	Independent Energy Producers
ISO	Independent System Operator
Monsanto	Monsanto Company
MW	Megawatt
PX	Power Exchange
QFs	Qualifying Facilities
RT	Reporter's Transcript
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
TLFs	Transmission Loss Factors
TOU	Time-of-Use

(END OF ATTACHMENT 2)

Commissioner Josiah L. Neeper, Concurring:

I am in agreement with the outcome of this decision: the distribution line loss factor should be modified, and the transmission line loss factor should not be modified at this time. I also agree that it is appropriate to allow SDG&E and other parties to present a case for modification of transmission line loss factors (TLFs) in the upcoming generic Section 390 proceeding. In that proceeding, which will encompass all electric utilities with QF contracts plus QFs and ratepayer groups, parties will be allowed to present any methodology they wish to calculate transmission line loss factors. Such methodologies could include the present methodology, the GMM calculation, or any other methodology. If SDG&E presents the GMM calculation, we should consider it afresh, without prejudice from the outcome of this case.

After reviewing the record, I believe it is likely that GMMs are better way of calculating transmission line losses than the present method. However, I agree with the ALJ that SDG&E did not prove that GMMs are preferable to a level of satisfaction that would allow the Commission to adopt this methodology. It is clear to me that the present methodology is incorrect. At this time, TLFs are set at 1.025 for all QFs, which represents a 1982 study that assumed that QFs impose zero transmission line losses on the system. That is irrational. QFs which use the transmission system must impose some line losses (even if miniscule), meaning that the TLF in use today is biased toward overpayments to QFs. Further, because various QFs impose different levels of line losses (and these line losses vary over time), the use of a single TLF must be inaccurate. Clearly, it is reasonable to seek a more refined methodology.

The GMM method purports to measure the specific line losses imposed by each QF through an "incremental" calculation performed by the ISO (and potentially to do so on an hourly basis). Thus, using GMMs could resolve each of the imperfections of today's method. It has the advantages of being QF-specific, potentially time-differentiated, and calculated by an impartial body. Even if imperfect, there is a strong likelihood that this would represent an improvement over what exists today.

However, GMMs are not perfect, as established in great detail in the record. And the problem is twofold. First, we do not have any objective standard of perfection to measure against, so we do not know how imperfect GMMs would be. This leads to the second problem: it is quite possible that GMMs would be biased against some, most or all QFs, leading to underpayments. Even if, as is likely, any overall level of underpayments with GMMs would be less than the overall level of overpayments today, I do not believe it is appropriate to change from one demonstrably systematically-biased methodology to a potentially systematically-biased methodology going in the other direction. This is the hurdle parties favoring GMMS will have to leap in order to convince me of its appropriateness in the Section 390 proceeding.

/s/ JOSIAH L. NEEPER
JOSIAH L. NEEPER
Commissioner

San Francisco, California
March 4, 1999

A.98-06-045
D.99-03-021

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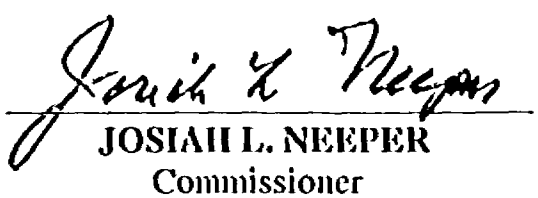

JOSIAH L. NEEPER
Commissioner

San Francisco, California
March 4, 1999