

Exhibit No.: _____

Commissioner: Loretta M. Lynch

Administrative Law Judge: Peter Allen

Witness: Armando J. Perez and Stephen Thomas

Greenleaf

**BEFORE THE PUBLIC UTILITIES COMMISSION OF
THE STATE OF CALIFORNIA**

Conditional Application of PACIFIC GAS AND
ELECTRIC COMPANY (U 39 E) for a Certificate
of Public Convenience and Necessity Authorizing
the Construction of the Los Banos-Gates 500 kV
Transmission Project

Application 01-04-012

**TESTIMONY OF ARMANDO J. PEREZ, STEPHEN THOMAS GREENLEAF
AND KEITH CASEY ON BEHALF OF
THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR**

Submitted by the California Independent System Operator

September 25, 2001

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13 Q. Please state your names, employer, positions, duties and qualifications.

14 A. Our names are Armando J. Perez, Director of Grid Planning of the California Independent
15 System Operator Corporation (CA ISO), Stephen Thomas Greenleaf, Director of Regulatory Policy in
16 the Corporate and Strategic Development Department of the CA ISO, and Keith Casey, Manager of
17 Market Analysis and Mitigation in the Department of Market Analysis of the CA ISO. A statement of
18 qualifications for Armando J. Perez and Stephen Thomas Greenleaf are submitted as attachments to this
19 testimony. A statement of qualifications for Keith Casey is submitted as an attachment to the Testimony
20 of Keith Casey and Mark Willis on behalf of the CA ISO.

21 Q. On whose behalf are you submitting this testimony?

22 A. We are submitting this testimony on behalf of the CA ISO.

23 Q. What is the purpose of your testimony?

24 A. The purpose of our testimony is to set forth the rationale for the CA ISO's conclusion that Pacific
25 Gas and Electric Company (PG&E) should be granted a Certificate of Public Convenience and
26 Necessity (CPCN) by the California Public Utilities Commission (CPUC) to upgrade Path 15. The CA
27 ISO has determined that upgrading Path 15 to increase transfer capability by 1500MW at a cost of
28 approximately 300 million dollars is economically justified to mitigate the risk of high prices due to: 1)

1 the exercise of market power; and 2) drought hydro conditions, as well as other factors. Our testimony:
2 1) briefly summarizes the CA ISO's conclusions regarding the justification for upgrading Path 15; 2)
3 briefly describes Path 15 and the alternatives under consideration to upgrade the path; 3) briefly
4 describes CA ISO proceedings to date in relation to upgrading Path 15; 4) discusses the assessment of
5 the economic benefits of upgrading Path 15 undertaken by the CA ISO, the conclusions drawn by the
6 CA ISO from the assessment and the basis for the CA ISO's conclusions; 5) briefly describes the CA
7 ISO Grid Planning Process; and 6) describes broad initiatives to review and meet transmission needs and
8 how a Path 15 upgrade fits within these initiatives.

9 Q. Do you use any specialized terms in your testimony?

10 A. Yes. Unless indicated otherwise, we use capitalized terms as defined in CA ISO Tariff
11 Appendix A: Master Definitions Supplement.

12 I. SUMMARY OF CA ISO CONCLUSIONS REGARDING THE ECONOMIC
13 JUSTIFICATION FOR UPGRADING PATH 15.

14 Q. Does the CA ISO consider that the CPUC should issue a CPCN to PG&E to upgrade Path 15?

15 A. Yes. The CA ISO considers that a \$300 million project to add 1500 MW of transfer capability at
16 Path 15 is economically justified to reduce the risk of high prices associated primarily with the exercise
17 of market power by strategically located generation and the existence of drought hydro conditions but
18 also other factors such as the risk of a low level of new generation development in Northern California.
19 An examination of historical Congestion costs and studies undertaken by the CA ISO show that 1)
20 between September 1, 1999 and December 31, 2000, Congestion on Path 15 cost California electricity
21 consumers up to \$221.7 million; and 2) using reasonable assumptions, the \$300 million cost of
22 upgrading Path 15 could potentially be recovered in within one drought year, plus three normal years.
23 Further, upgrading Path 15 is consistent with a broader strategy to put into place a robust high-voltage
24 transmission system that supports cost-effective and reliable electric service in California and a broader
25 and deeper regional electricity market.

26 II. PROJECT DESCRIPTION.

27 Q. Please describe Path 15 and its existing transfer capability.

28 A. Path 15 is a transmission interface located in the southern portion of the PG&E service area and

1 in the middle of the CA ISO control area. The path consists of two 500kV lines: Los Banos-Gates, and
2 Los Banos-Midway; and four 230kV lines: Gates-Panoche #1, Gates-Panoche #2, Gates-Gregg, and
3 Gates-Mc Call. Path 15 is a major part of the Pacific Alternating Current Intertie (PACI) which was built
4 to facilitate seasonal exchanges between California and the Pacific Northwest as well as to reinforce the
5 ability to transmit energy between Northern and Southern California. The majority of the flow of power
6 from Southern California to Northern California and to the Pacific Northwest flows over Path 15; the
7 remaining small percentage (unscheduled flow) goes through Arizona, Nevada, Utah and Idaho. The
8 maximum south-to-north limit on the path is 3750 MW.

9 Historically, Path 15 has played a major role in the seasonal exchanges that take place between
10 Northern and Southern California, and California and the Pacific Northwest. The majority of thermal
11 generation in California is located in Southern California (and the desert Southwest), whereas the
12 majority of the hydroelectric facilities are located in Northern California and Pacific Northwest. In large
13 part driven by this geographic dispersion of thermal and hydroelectric generation, power typically flows
14 from the south to north over Path 15 during winter off-peak hours, in part to enable northern
15 hydroelectric resources to restock and conserve their water supplies, thus making those critical resources
16 available during critical peak periods. This historical use of resources (and Path 15) has held constant
17 even after the implementation of restructuring in California. However, these historical seasonal
18 exchanges and resultant power flows over Path 15 have often been limited by the operating capacity of
19 Path 15. Thus, since the CA ISO began operations, Path 15 has been defined as an Inter-Zonal Interface
20 (connecting the Congestion Zone north of Path 15 -- NP15 -- with the Congestion Zones south of Path
21 15 -- SP 15 and ZP26) in the CA ISO's Congestion Management process. As a result of this designation,
22 transmission customers (Scheduling Coordinators) that submit schedules that use Path 15 must pay a
23 charge (Usage Charge) for the right to use the constrained or "scarce" transmission capacity available on
24 Path 15.

25 Q. Please describe the alternatives that have been identified by PG&E to upgrade Path 15.

26 A. In the latest information PG&E shared with the CA ISO, PG&E had identified two alternatives to
27 upgrade Path 15: 1) alternative 1 which consists of adding a third series compensated 500 kV line from
28 Los Banos to Gates, looping the 500 kV Los Banos - Midway #2 line into Gates, and adding 500MVAR

1 shunt capacitors at the Los Banos and Gates 230 kV buses; and 2) alternative 2 which consists of
2 installing an uncompensated 500 kV line from Los Banos to Gates and installing 250 MVAR shunt
3 capacitors at the Los Banos and Gates 230 kV buses. According to the most recent information
4 provided to the ISO by PG&E, both alternatives are projected to cost in the neighborhood of \$300
5 million and would result in a 1500 MW increase in transfer capability over Path 15¹.

6 III. CA ISO PROCEEDINGS TO DATE REGARDING UPGRADING PATH 15

7 Q. Please describe CA ISO proceedings to date regarding upgrading Path 15.

8 A. The concept of upgrading Path 15 has been discussed for quite a number of years in California.
9 These discussions took on additional urgency in the recent year after extreme congestion on Path 15
10 during 2000 contributed to involuntary load curtailments in January 2000 and likely contributed
11 significantly to the ability of suppliers to exercise market power. Accordingly, since the beginning of
12 this year, the CA ISO has engaged in conversations with PG&E, and representatives from state and
13 federal agencies, regarding upgrading Path 15. In addition, the CA ISO undertook an assessment of the
14 cost of Congestion on Path 15 during the sixteen-month period from September 1, 1999 through
15 December 31, 2000.

16 On March 29 of this year, CPUC President Lynch issued an Assigned Commissioner's Ruling
17 directing PG&E to file a CPCN for upgrading Path 15 by April 13, 2001. PG&E filed a conditional
18 application for a CPCN at that time. The CA ISO has worked cooperatively with PG&E since then to
19 assess alternatives and review reliability and economic impacts of an upgrade. The CA ISO agreed
20 early on to focus on assessing the economic justification for a Path 15 upgrade, allowing PG&E to focus
21 on developing more detailed definitions of alternatives available to upgrade Path 15 and their costs, and
22 on assessing the reliability impacts of such alternatives. This testimony sets forth the results of the CA
23 ISO's economic assessment and the conclusions it has drawn from the results. These conclusions were
24 shared with the CA ISO Governing Board on September 20, 2001.

25 The economic assessment of upgrading Path 15 was a significant undertaking, particularly since
26 it is the first formal economic assessment of a transmission project undertaken by the CA ISO and a
27

28 ¹ PG&E has not provided the ISO with documentation supporting the estimated cost of the two alternatives thus
the ISO cannot confirm the accuracy of these estimates.

1 large number of variables had to be considered. Accordingly, the assessment was only completed
2 recently, in time for submission of this testimony. The CA ISO has therefore not yet made any formal
3 determination regarding which of the Path 15 upgrade alternatives developed by PG&E is preferable.
4 Moreover, CA ISO management has not yet presented the project to the CA ISO Governing Board for
5 its approval – an action that, consistent with its existing practice regarding large transmission projects
6 (i.e., projects with a value of \$20 million or greater), is necessary before the CA ISO can authorize
7 PG&E to proceed with permitting and construction of the project.

8 IV. CA ISO ECONOMIC ASSESSMENT OF THE BENEFITS OF UPGRADING PATH 15

9 Q. Please describe the CA ISO's assessment of the potential economic benefits of increasing Path
10 15 transfer capability.

11 A. There are three primary components to the CA ISO's assessment of the potential economic
12 benefits of increasing Path 15's transfer capability: 1) an assessment of the costs to California electricity
13 users from Congestion on Path 15 during the sixteen months from September 1, 1999 to December 31,
14 2000; 2) an assessment of the potential benefits to California electricity users from a 1400 MW increase
15 in Path 15 transfer capability in the year 2005, assuming a competitive electricity market; and 3) an
16 assessment of the potential benefits to California electricity users from a 1400 MW increase in Path 15
17 transfer capability in the year 2005 as a mechanism to reduce costs from the exercise of market power
18 (i.e., without arbitrarily assuming a competitive electricity market)². The assessment of the costs to
19 California electricity users from congestion over Path 15 during the sixteen months from September 1,
20 1999 to December 21, 2000 was completed in February 2001 and that report is attached to PG&E's
21 conditional application for a CPCN, filed April 13, 2001, at tab B. That report is described in the
22 Testimony of Keith Casey and Mark Willis on behalf of the CA ISO (Willis/Casey testimony). The
23 assessment of potential benefits to California electricity users from a 1400 MW increase in Path 15
24 transfer capability in the year 2005 assuming a competitive electricity market was completed recently, is
25 described in the Willis/Casey testimony, and is attached to the Willis/Casey testimony as attachment 3.

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27 ² Initially, PG&E had indicated that Alternative 2 would add 1400 MW of new capacity thus as a conservative
28 estimate, the ISO assumed in its studies that the upgrade would result in 1400 MW of new capacity rather than
1500 MW. As discussed above, PG&E now indicates both alternatives would result in an additional 1500 MW of
transfer capability.

1 The assessment of the potential benefits to California electricity users from a 1400 MW increase in Path
2 15 transfer capability in the year 2005 as a mechanism to reduce costs from the exercise of market
3 power was completed recently, is described in the Willis/Casey testimony, and is attached to the
4 Willis/Casey testimony as attachment 4.

5 Q. In summary, what are the results of the CA ISO's assessment of the economic benefits of
6 upgrading Path 15?

7 A. The results of the studies that comprised the assessment of the economic benefits of upgrading
8 Path 15 are described in detail in the studies themselves. Briefly, the studies show that: 1) between
9 September 1, 1999 and December 31, 2000, congestion over Path 15 cost California electricity users up
10 to \$221.7 million; and 2) using reasonable assumptions, the \$300 million cost of upgrading Path 15
11 could potentially be recovered in within one drought year plus three normal years.

12 Q. Which are the key factors that drive the level of potential economic benefits from increasing the
13 transfer capability over Path 15 in 2005?

14 A. Five factors strongly affect the level of potential economic benefits from added transfer
15 capability over Path 15 in 2005:

- 16 • whether a perfectly competitive market is assumed;
- 17 • whether the year in question is a drought hydro year;
- 18 • whether capacity subject to existing transmission contracts (ETC) is assumed to be available for
19 general use;
- 20 • whether and where new generation is assumed to be added; and
- 21 • whether existing long term contracts secured by the State of California are assumed to be in
22 effect.

23 Q. What does the CA ISO conclude as to the economic justification for upgrading Path 15?

24 A. The CA ISO concludes that an upgrade to Path 15 is economically justified as a way to reduce or
25 eliminate Congestion, as a mechanism to reduce costs that result from the exercise of market power and
26 as a hedge against high prices in certain low hydro power/new generation conditions. As described
27 above, according to PG&E, the cost of upgrading Path 15 is approximately \$300 million. The
28 assessments undertaken by the CA ISO indicate that, under plausible scenarios, the economic benefits

1 from upgrading Path 15 exceed this level of costs in a few years. The fact that Congestion costs over a
2 recent sixteen-month period exceeded \$200 million reinforces the CA ISO's view that upgrading Path 15
3 is economically justified. Finally, upgrading Path 15 is consistent with the determination by many
4 policy makers that a robust transmission system with strong interregional transfer capability is important
5 to support cost-effective and reliable electric service in the Western United States.

6 Q. Please explain why you believe the benefits of the upgrading Path 15 would exceed the costs in a
7 few years under plausible scenarios?

8 A. As stated earlier, the assessment undertaken by the CA ISO illustrates that the potential level of
9 economic benefits of a Path 15 upgrade is highly sensitive to assumptions about whether and to what
10 extent suppliers will exercise market power; hydro conditions; whether unused ETC capacity is deemed
11 to be fully available to the market; whether and where new generation materializes; and whether long-
12 term contracts secured by the State remain in effect. We believe that it is very plausible to assume that
13 if suppliers have the ability to exercise market power they will do so; that drought conditions will
14 materialize with a one-in-ten year probability, as they have in the past; and that unused ETC capacity for
15 unexpired ETCs will continue to be constrained from full utilization. In addition, we believe that there
16 continues to be significant uncertainty about whether and where new generation will materialize.
17 Finally, we believe that it is possible (although not necessarily likely) that the State may seek to
18 renegotiate or terminate long-term contracts that it has secured.

19 We estimate the economic benefits to California load from upgrading Path 15 in 2005, making
20 the plausible assumptions that at least one drought hydro year can be assumed, that there will be a
21 medium build out of new generation in northern California, and that the State's long term energy
22 contracts remain in effect, to be \$62 million (assuming that ETC capacity is fully available and utilized)
23 and \$205 million (assuming that ETC capacity remains unavailable to the forward energy market). Even
24 in a normal hydro year the benefits range from \$31 million assuming ETCs are fully utilized to \$104
25 million if ETC capacity is unavailable. These figures illustrate that using reasonable assumptions the
26 economic benefits resulting from a \$300 million upgrade could potentially exceed the cost of the
27 upgrade within one drought hydro year and three normal years. Historic Congestion costs on Path 15
28 during the past two years support the conclusion that an upgrade to Path 15 could pay for itself within a

1 few years, assuming certain plausible conditions.

2 If a low level of new generation is assumed to come on line in Northern California and the
3 northwest, the economic benefits are significantly higher, between \$189 million and \$842 million in
4 drought years, and \$69 million and \$209 million in normal years, depending on the ETC capacity that is
5 ultimately available. Moreover, assuming average new generation development, if State long-term
6 contracts are assumed to terminate, benefits range from \$91 to \$305 million in a drought year and from
7 \$48 million to \$162 million in a normal year, depending on the level of ETC capacity that is ultimately
8 available. Assuming low generation development in Northern California and the northwest and that
9 state long-term contracts terminate, benefits range from \$289 to \$1,304 million in a drought year and
10 from \$109 million to \$325 million in a normal year, depending on the level of ETC transmission
11 capacity that is ultimately available. Accordingly, an added value of upgrading Path 15 is as insurance
12 against the risk of high prices if less generation develops in Northern California and the northwest than
13 is expected and/or if State long-term contracts terminate, and thus generation owners in Northern
14 California are able to demand high prices for their strategically located generation.

15 Q. Please discuss your view that suppliers who have the ability to exercise market power will do so.

16 A. The third study undertaken by the CA ISO assessed the benefits of upgrading Path 15 without an
17 arbitrary assumption that there will be a competitive market. The study did not assume that undue
18 market power would be exerted in all cases. Rather, the study used current information to predict
19 supplier portfolios in 2005 and, based on this information and the experience in the market in 2000,
20 determined whether there would be suppliers able to exercise market power in 2005. The study then
21 estimated, under different scenarios, the level of price cost mark-up (i.e., mark-up above competitive
22 market price levels) that could be expected. Thus, the study does not automatically assume the exercise
23 of market power, but neither does it automatically assume a perfectly competitive market.

24 The past year and a half have shown dramatically that 1) it is inaccurate to arbitrarily assume a
25 competitive market, without carefully examining actual circumstances, and 2) the costs from the
26 exercise of market power can be very significant. Based on the experience in California electricity
27 markets in the last year, the CA ISO considers that absent measures to restrain the exercise of market
28 power, it is more accurate to assume that suppliers able to exercise market power will do so, than it is to

1 assume a perfectly competitive market without regard for the ability of suppliers to exercise market
2 power.

3 While current measures adopted by the Federal Energy Regulatory Commission (FERC) have
4 somewhat curbed the ability of suppliers to continue the practice of bidding significantly above their
5 costs, FERC has indicated that these measures are of a temporary nature. Accordingly, the CA ISO
6 believes that it is necessary and prudent to put into place the infrastructure necessary to permanently
7 diminish the ability of suppliers to exercise market power in California, such as upgrading Path 15.

8 Q. Please explain your view that a drought hydro scenario is plausible.

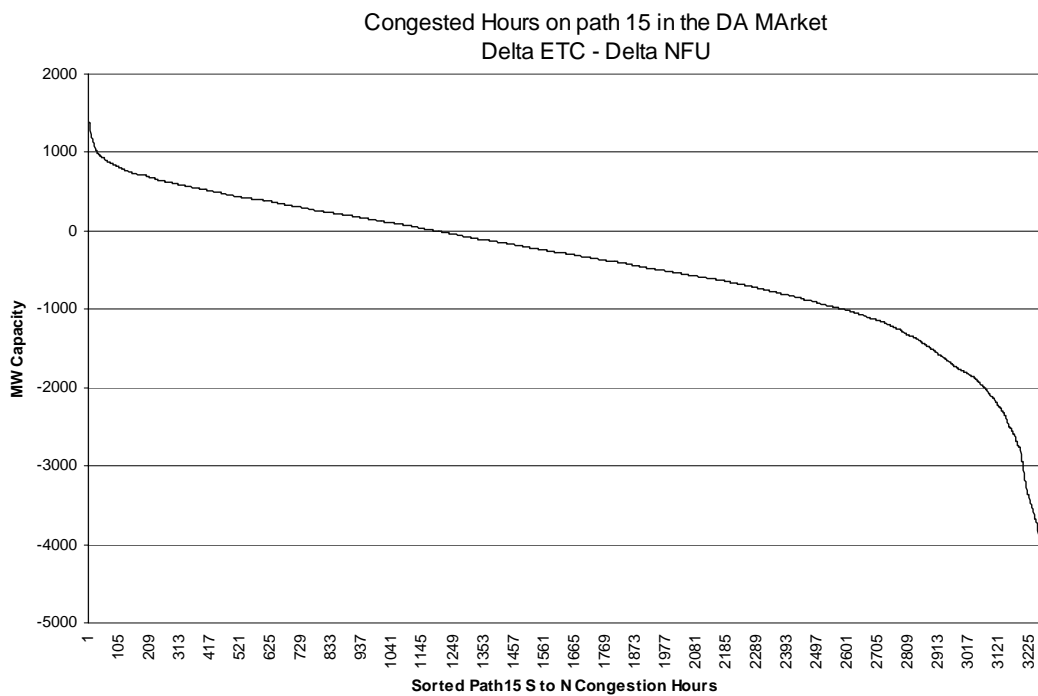
9 A. The benefits of a Path 15 upgrade are most significant in drought hydro conditions. Drought
10 hydro conditions are a recurring phenomenon in the West: the drought conditions modeled in the CA
11 ISO studies have a one-in-ten year probability of occurring. There is no question that there will be
12 drought years in the future that will affect the California electricity market; the only real question is
13 when these will occur. Moreover, there is a possibility of more than one drought hydro year in a row.
14 In these circumstances, the benefits of upgrading Path 15 would become particularly significant.

15 Q. Please discuss your view that unused transmission subject to ETCs will continue to be
16 constrained.

17 A. FERC has required the CA ISO and the existing Participating Transmission Owners
18 (Participating TOs) to honor all ETCs. Many ETCs give their rightsholders scheduling rights up to 20
19 minutes prior to transaction times; some ETCs even allow rightsholders to schedule up to the transaction
20 time. As a result, the transmission capacity associated with ETCs is unavailable to Market Participants,
21 until 20 minutes prior to transaction time. Since all other Market Participants must submit Hour-Ahead
22 Schedules to the CA ISO two hours prior to the hour in which a transaction occurs, Market Participants
23 cannot utilize any ETC capacity that may become available 20 minutes prior to an hour. While FERC
24 has on several occasions asked questions about its policy of honoring ETCs, to date it has maintained the
25 policy.

26 ETC right holders could, and in accordance with sound economic theory should, sell unused
27 capacity to other Market Participants in forward markets. However, either because of contractual
28 constraints or other impediments, in practice, a significant proportion of transmission capacity subject to

1 ETCs has consistently remained unused, even when there is congestion in the CA ISO Day Ahead
 2 scheduling process. The CA ISO applies the term "paper" Congestion to circumstances in which
 3 Congestion occurs in the Day Ahead or Hour Ahead markets only because Market Participants did not
 4 have access to ETC transmission capability that ultimately remained unused. CA ISO analysis indicates
 5 that in 2000 there was "paper" Congestion south to north over Path 15 37% of the time in the Day Ahead
 6 market, and 77% of the time in the Hour Ahead market. Further figures 1 and 2 below show for 2000
 7 the portion of transactions that could have been accommodated over Path 15 over unused ETC
 8 transmission capacity in Congested hours in the Day Ahead and Hour Ahead markets:



22 Figure 1: Year 2000 Path 15 south-to-north "paper" Congestion in the Day Ahead market

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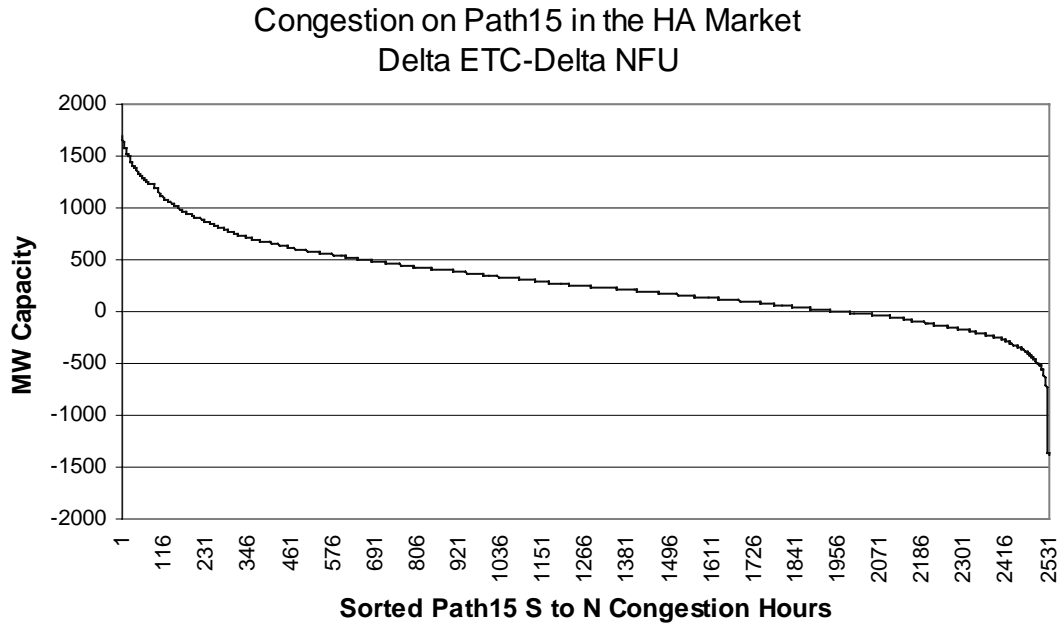


Figure 2: Year 2000 Path 15 south-to-north "paper" Congestion in the Hour Ahead market

At the same time, FERC has stressed the importance of entering into forward transactions and created disincentives for use of real time markets. In fact, the bulk of market activity has begun shifting to forward markets. Accordingly, the vast majority of market activity will likely to take place in forward markets where transmission capacity subject to ETC will not be available, unless, contrary to current practice and restrictions, ETC rights holders begin selling available transmission capacity subject to ETC to other Market Participants in the forward markets.

Assumptions about available ETC capacity do have to account for the fact that, in 2005 some of the ETCs relating to Path 15 will terminate. However, at least one contract for some 800MW will remain in effect for well beyond 2005.

Given the circumstances described above, the CA ISO considers that it is reasonable to assume that some portion of unused ETC capacity will remain unavailable for CA ISO and Market Participant use in the forward markets. It is difficult to project the exact proportion that will remain unavailable as it depends on the actions and motivations of ETC holders and FERC. Nonetheless, as in the case of market power, experience to date weighs against unduly optimistic assumptions about the availability of unused ETC transmission capacity. Thus, while inexact, the CA ISO considers that it is reasonable to

1 assume that roughly half of ETC transmission capacity will remain unavailable for use by Market
2 Participants in the forward electricity markets.

3 Q. How does uncertainty as to the development of new generation affect the CA ISO's assessment
4 of the economic justification for upgrading Path 15?

5 A. The economic benefits of upgrading Path 15 vary significantly depending on the extent and
6 location of new generation development. If little generation develops north of Path 15, upgrading Path
7 15 becomes particularly economically attractive. Upgrading Path 15 is far less economically beneficial
8 if substantial new generation develops north of Path 15.

9 The CA ISO has no reason to believe that new generation is more likely to develop north or
10 south of Path 15. However, there is a high degree of uncertainty associated with the development and
11 location of new generation. Thus, upgrading Path 15 provides added insurance against potential high
12 costs if for some reason that cannot be predicted at this time, a low level of new generation develops
13 north of Path 15.

14 Q. Please explain why you believe that it is possible (although not necessarily likely) that the State
15 may seek to renegotiate or terminate long-term contracts that it has secured?

16 A. We believe that if the contracts prices are deemed to be substantially higher than prevailing
17 market prices over the next few years, the State may seek to terminate or renegotiate the terms of the
18 contracts. We have no information to suggest whether or not this is likely. Nonetheless, if the contracts
19 are not in place, the benefits of added transfer capability over Path 15 are substantially higher. Thus, an
20 added benefit of upgrading Path 15 is as a hedge against higher prices if the long-term contracts secured
21 by the State are no longer in effect in 2005.

22 23 VI. SUMMARY OF CA ISO TRANSMISSION PLANNING PROCESS

24 Q. Please explain the CA ISO's responsibilities in the transmission planning and expansion process
25 in California.

26 A. Pursuant to the provisions of Assembly Bill 1890 (AB 1890), the CA ISO is charged with
27 maintaining the reliability of the CA ISO Controlled Grid. The CA ISO Controlled Grid is comprised of
28 transmission facilities and rights turned over to the CA ISO's Operational Control by PG&E, Southern

1 California Edison Company, San Diego Gas & Electric Company and the City of Vernon, California
2 (collectively, the Participating Transmission Owners or Participating TOs). Concomitant with the CA
3 ISO's responsibility to maintain system reliability, the CA ISO is also charged with planning and
4 expanding the CA ISO Controlled Grid so as to ensure a reliable and efficient transmission system.
5 These functions and responsibilities are codified in the CA ISO Tariff, which is on file and available for
6 public inspection at FERC.

7 Q. Please explain the CA ISO's transmission planning and expansion process.

8 A. Because transmission planning and expansion are important elements of maintaining reliability and
9 ensuring the efficient use of the CA ISO Controlled Grid, the CA ISO Tariff (CA ISO Tariff section 3.2)
10 and each Participating TO's Transmission Owner (TO) tariff (see e.g. PG&E TO tariff sections 8 and 9)
11 provide for a coordinated planning process. As described further below, the coordinated planning
12 process requires that, each year, the CA ISO and the Participating TOs assess the adequacy of the CA
13 ISO Controlled Grid and determine whether additional facilities are required to ensure that energy can
14 be reliably and efficiently delivered to load.

15 Q. Please describe the goals and requirements of the CA ISO coordinated planning process.

16 A. The CA ISO Tariff requires Participating TOs to identify, plan and construct transmission
17 additions and upgrades within their Service Areas that are determined to be needed. A transmission
18 addition or upgrade is deemed to be needed if it would promote economic efficiency or is necessary to
19 maintain system reliability. Section 3.2 of the CA ISO categorizes and identifies those projects
20 necessary to reliably deliver energy to load as "reliability driven" transmission projects and those
21 projects deemed to be necessary on grounds of maximizing the efficiency of the CA ISO Controlled
22 Grid as "economic" transmission projects.

23 Reliability-driven projects are deemed to be needed if they are necessary to satisfy specified
24 reliability criteria. The CA ISO coordinates the planning of modifications to the CA ISO Controlled
25 Grid to ensure that, at a minimum, they meet the CA ISO Grid Planning Criteria. The CA ISO Grid
26 Planning Criteria incorporate the Western Systems Coordinating Council (WSCC) Reliability Criteria,
27 the North American Electric Reliability Council (NERC) Planning Standards, and local area reliability
28 criteria. Economic projects are deemed to be needed if either the project sponsor commits to pay for the

1 cost of the upgrade or has proposed a cost-allocation methodology that assigns the cost of such project
2 to the identified beneficiaries of the proposed project (subject to the CA ISO's dispute resolution
3 procedures).

4 Because the CA ISO's transmission planning function relates solely to its responsibilities to
5 maintain a reliable and efficient transmission system, the CA ISO does not focus on a detailed
6 consideration of environmental, routing, social and aesthetic factors. The CA ISO believes that these
7 factors are appropriately considered in the CPUC's CPC&N process.

8 Importantly, the CA ISO coordinated planning process is flexible in that transmission projects
9 can be proposed by a variety of entities, including the Participating TOs, the CA ISO or any entity who
10 participates in the Energy marketplace through the buying, selling, transmission or distribution of
11 Energy or Ancillary Services. Thus, any Market Participant can step forward to become the sponsor of a
12 transmission project. Having all these interests participate in the planning process is expected to
13 facilitate the development of a CA ISO Controlled Grid that best meets the needs of all its users and
14 maximizes the potential benefits to the State of California.

15 Q. Can you summarize how the CA ISO coordinated planning process works?

16 A. The CA ISO coordinated planning process includes an annual planning process to identify
17 necessary transmission upgrades and expansions. Participating TOs are required to develop, and submit
18 to the CA ISO, annual transmission expansion plans for the portion of the grid owned by the
19 Participating TO. These plans describe the facility additions proposed by a Participating TO over a
20 minimum five-year planning horizon, although recently the CA ISO has required Participating TOs to
21 consider a longer period. The annual transmission expansion plans submitted by the Participating TOs
22 identify those areas of the transmission system where upgrades or enhancements are necessary to satisfy
23 the applicable reliability criteria and evaluate the technical merits of various transmission, generation
24 and operating solutions. The annual planning process is open to all Market Participants and is the forum
25 in which their concerns and proposed projects can be considered. The CA ISO reviews the Participating
26 TO's annual transmission expansion plans for adequacy. If the CA ISO finds that a plan does not meet
27 the CA ISO Grid Planning Criteria, or the CA ISO identifies solutions that would be preferable
28 compared to those proposed by a Participating TO, the CA ISO provides comments and may propose

1 changes or additions to a Participating TO's annual plan. Disagreements between the CA ISO and a
2 Participating TO related to a change or addition to the plan proposed by the CA ISO are subject to the
3 alternative dispute resolution procedures set forth in the CA ISO Tariff.

4 Q. Please describe the review that the CA ISO undertakes of the Participating TOs annual
5 transmission expansion plans.

6 A. Review by the CA ISO primarily focuses on whether the projects included in Participating TOs
7 annual transmission expansion plans (including and taking into account new generator interconnections)
8 meet the CA ISO Grid Planning Criteria. In addition, the CA ISO conducts an operational review to
9 ensure that projects meet the CA ISO's need for operational flexibility and the CA ISO requirements for
10 proper integration with the CA ISO Controlled Grid. Finally, the CA ISO examines and reviews the
11 Participating TO's annual transmission expansion plans including new requests for interconnection to
12 the CA ISO Controlled Grid, with the aim to develop an integrated transmission plan for the entire CA
13 ISO Controlled Grid. In this context the CA ISO may develop and recommend projects that are part of a
14 larger regional expansion plan or necessary to integrate the plans of the Participating TOs.

15 In the process of reviewing reliability-driven projects the CA ISO also evaluates whether proposed
16 projects are cost-effective when compared to other transmission solutions and, if applicable, other non-
17 transmission related (non-wires) projects that are equally reliable. As described earlier, to the extent a
18 project is proposed not for reliability reasons but for economic reasons, the CA ISO will determine
19 whether the cost of the project should be incorporated into the Access Charge or split among its
20 identified beneficiaries. If a third party proposes to pay the full cost of a project, the CA ISO does not
21 undertake a thorough economic analysis, although it may recommend more economic alternatives.

22 If the CA ISO approves a transmission upgrade, the Participating TO is obligated to use its best
23 effort to obtain the regulatory approvals and other arrangements as necessary to construct the upgrade.
24 Licensing, design and construction of projects approved by the CA ISO are tracked by the CA ISO to
25 ensure that a project will be in service when needed.

26 Q. Why is it important for the CA ISO to consider both the need for reliability related and economic
27 transmission projects as part of its transmission planning and expansion process?

28

1 A. The need for the CA ISO to consider, and properly plan, reliability-related transmission upgrades
2 and expansions is self-evident. The CA ISO has a statutory responsibility to ensure that the CA ISO
3 Controlled Grid is reliable. Moreover, the CA ISO's FERC approved tariff requires that the CAISO
4 operate and maintain the grid in a reliable manner.

5 In order to address the need for the CA ISO to identify and plan economic transmission projects,
6 one must examine the broader policy underpinnings of CA ISO responsibilities. While the CA ISO has
7 both a statutory and tariff obligation to ensure efficient use of the CA ISO-controlled transmission
8 system, efficiency can be defined in a number of ways. Thus, when evaluating the need for
9 transmission, it is important to consider the core functions of the CA ISO.

10 Q. Please explain.

11 A. At its most basic level, the CA ISO is charged with providing open, non-discriminatory and
12 reliable transmission service to all users of the transmission system. In theory, the provision of open and
13 non-discriminatory transmission service will ensure that all Market Participants have access to
14 alternative suppliers of various services and new customers and thus facilitate a competitive market for
15 these services and customers. Obviously, in order to accommodate such access, a transmission system
16 must be robust and reliable. Thus, in order to satisfy its most basic responsibilities, the CA ISO must
17 ensure that the CA ISO Controlled Grid is expanded in a manner that ensures that all customers have fair
18 and non-discriminatory access to the transmission system and that the transmission system provides
19 access to new and alternative suppliers of critical services.

20 Q. Does FERC support the need for and creation of a robust transmission network necessary to
21 support a competitive market?

22 A. Most certainly. In FERC's Order No. 2000 regarding the formation of Regional Transmission
23 organizations (RTOs), FERC identified "Transmission Planning and Expansion" as one of eight critical
24 functions of an RTO. FERC stated that an RTO must have ultimate responsibility for both transmission
25 planning and expansion to enable it to provide "efficient, reliable and non-discriminatory service." (89
26 FERC ¶ 61,285 at 485). More recently, in reviewing PJM's RTO filing, FERC stressed that in
27 undertaking its RTO planning responsibilities, PJM must go beyond maintaining reliability, and must
28 identify projects that "expand trading opportunities, better integrate the grid, and alleviate congestion

1 that may enhance market power.” 96 FERC ¶ 61,061, 61,240. FERC explained that although
2 maintaining reliability in an economic and environmentally acceptable manner is an important objective,
3 "the focus of an RTO regional plan that supports the development of a competitive bulk power market
4 must be broader", . . . "planning protocols must fully explain how the RTO 'will pursue infrastructure
5 investment that will make generation markets more competitive.'" Id.

6 Q. What are the broader benefits of a robust transmission system?

7 A. As explained above, the broader benefits of a robust transmission system are increased
8 competition among suppliers and, presumably, lower prices for critical services. Absent sufficient
9 transmission capacity, customers may not have adequate access to alternative suppliers and may be
10 forced to buy from strategically located suppliers who can demand high prices for energy and other
11 services. A robust transmission system will ensure that the potential ability of suppliers to exercise
12 market power has been mitigated.

13 Q. Has the CA ISO undertaken a detailed economic assessment of a major transmission project
14 before?

15 A. No. Path 15 is the first project of its size and importance to be assessed in detail by the CA ISO
16 from an economic standpoint. In fact, Path 15 is one of the first projects nationally to be reviewed from
17 the standpoint of reducing market power and hence facilitating a fully competitive wholesale electricity
18 market. Thus, the assessment of the project and its review will likely establish precedent for justifying
19 future economic transmission projects not only in California but in the entire country.

20 At the same time, the CA ISO is in the process of developing a more formal methodology to
21 assess transmission projects from an economic standpoint, cooperatively with the CPUC, the California
22 Energy Commission, the Electricity Oversight Board and the utilities. The CA ISO is hopeful that this
23 effort, along with the lessons learned through the Path 15 proceedings before the CPUC will result in an
24 enhanced and robust methodology to assess the economic benefits of proposed transmission projects in
25 California.

26 VII. PATH 15 UPGRADE AS A COMPONENT OF A ROBUST 500KV TRANSMISSION 27 BACKBONE

28 Q. How does upgrading Path 15 fit within broader initiatives to strengthen the transmission system

1 in California and the West?

2 A. The distortions in the California and western electricity markets during the past year and a half
3 have led key state and federal policy makers, as well as electric industry professionals, to conclude that a
4 robust transmission system within California and the West is fundamental to support cost effective,
5 reliable electric service in the region. For example:

- 6 • in September 2000, the California Legislature passed AB 970 which requires the California Public
7 Utilities Commission and the CA ISO to work together to "[i]dentify and undertake those actions
8 necessary to reduce or remove constraints on the state's existing electrical transmission . . . system"
9 and to "give first priority to those geographical regions where congestion reduces or impedes
10 electrical transmission and supply";
- 11 • on May 16, 2001, the FERC issued an order highlighting the importance of upgrading the
12 transmission system and offering an improved rate of return for certain transmission upgrades that
13 improve transfer capability;
- 14 • Earlier this year, the Western Governors Association (WGA) convened a group of experts to
15 identify transmission upgrades necessary to support a robust competitive market.

16 A WGA sponsored study was completed in August. California participated in the study through
17 representatives from the California Energy Commission, the CPUC, the CA ISO, and others. One of the
18 principles that the WGA adopted to guide the expansion of the Western System is:

19 "Any expansion of the transmission system must maintain reliability, support both load and
20 resource diversity in the Western Interconnection, and enable an efficient wholesale electric
21 market."³

22 The WGA report specifically refers to Path 15 as an example where constrained transmission has led to
23 significant price differentials:

24 "The value of relieving transmission constraints was illustrated in late 2000 when transmission
25 constraints between southern and northern California led to significant price differentials at the
26 major trading hubs in the Western Interconnection. Prices north of the constraint (e.g.,
27 California-Oregon Border, Mid-Columbia) were significantly higher than prices south of the

28 ³ Page 5 of the WGA Report.

1 constraint (e.g., Palo Verde, Marketplace in southern Nevada, Four Corners)."⁴

2 "However, the Path 15 bottleneck is significant and has contributed to price volatility in the
3 West. A special analysis of the west using 2001 gas prices and hydro conditions similar to last
4 summer showed congestion and spot market differences (\$35 and \$65 dollars per megawatt
5 hour) between each end of the path."⁵

6 In fact, when the WGA completed their study, they deemed the expansion of Path 15 to be such a logical
7 transmission addition that it was assumed to be in-service in all of the future case studies conducted.

8 Simultaneously with these broad initiatives that are underway in the Legislature, FERC, and the
9 WGA, the CA ISO has been working with state agencies and utilities to develop a broad vision for a
10 robust transmission system for the state. In particular, the CA ISO has begun developing a vision of an
11 adequate 500 kV backbone transmission system. Several key projects have been identified and Path 15
12 has been determined to be one of the highest priority projects. There are also plans to increase the
13 transmission capability between the Southern California Edison Company and PG&E transmission
14 systems on Path 26 and to increase transmission capability between the San Diego area and the rest of
15 the state. In addition, to enhance the reliability of service to the San Francisco and Fresno areas, studies
16 are underway to review adding major new 500 kV substations in those areas.

17 Q. Is the CA ISO aware of any other efforts underway to review options for upgrading Path 15.

18 A. Yes. The CA ISO is aware that the Western Area Power Administration (WAPA) has been
19 reviewing alternatives to upgrade Path 15. The CA ISO considers that it is important to ensure that
20 ultimately there is coordination and consistency between the actions of the CPUC and those of WAPA.

21 Q. Thank-you. I have no further questions.
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28 ⁴ Page 10 of the WGA Report.

⁵ Page 21 of the WGA Report.