

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

2
3 In the Matter of the Application of Pacific)
4 Gas and Electric Company (U 39 E) for a)
5 Certificate of Public Convenience and) Application 02-09-043
6 Necessity Authorizing the Construction) (Filed September 30, 2002)
7 of the Jefferson-Martin 230 kV Transmission)
Project.)

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9 PREPARED TESTIMONY OF BARRY R. FLYNN ON BEHALF OF
10 THE CITY AND COUNTY OF SAN FRANCISCO
11 REGARDING THE NEED FOR THE JEFFERSON-MARTIN 230 kV
12 TRANSMISSION PROJECT

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19 October 10, 2003

Respectfully submitted,
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21
22 By: _____
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26 San Francisco, CA 94102

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14 Question 1: Please state your name, professional qualifications and experience and
15 educational background.

16 Response 1: My name is Barry R. Flynn. I am founder and principal of Flynn
17 Resource Consultants Inc., a consulting firm which specializes in transmission grid planning and
18 energy regulatory support services. My professional qualifications and experience are presented
19 in more detail in my resume, which is attached hereto as Exhibit A. Prior to founding Flynn
20 Resource Consultants Inc., I was President of Applied Power Technology, a privately held
21 renewable resource and development company; Director of Electric Utility for the City of Santa
22 Clara, a municipal utility; and Senior Transmission Planning Engineer for PG&E. As a Senior
23 Transmission Planning Engineer for PG&E, I supervised a staff of engineers that planned the
24 development of the high voltage transmission system for the greater Bay Area.

25 I earned a Bachelor of Science degree in electrical engineering from the University of California
26 at Berkeley and a Masters degree in electrical engineering from the University of Santa Clara. I
27 am registered with the State of California as a Professional Electrical Engineer.

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Question 2: What is the purpose of your testimony?

Response 2: To comment on the inadequacy of the California Independent System Operator (California ISO) Planning Standards as a reliability criterion for San Francisco. Because San Francisco contains old unreliable power plants at Potrero and Hunter's Point, and the California ISO Planning Standards do not account for this generation unreliability, The California ISO Planning Standards are an insufficient measure to judge the degree of electric system reliability in San Francisco.

Question 3: Please summarize your opinion.

Response 3: Providing an electric system that meets the reliability criteria contained in the California ISO Planning Standards may not be sufficient to provide reliable power to San Francisco.

Question 4: What standards are used to plan for the transmission system on the San Francisco Peninsula?

Response 4: The California ISO Planning Standards. The California ISO Planning Standards contain a complex set of criteria, any one of which can be a limiting condition that would dictate the need for new transmission facilities. Out of six generating units in the City, the typical limiting condition, when one applies the California ISO Planning Standards, is that either all but the largest of those generating units are available at the time of the peak electric load, or all but the largest generating unit and one of the smaller gas turbines is available when a transmission line failure occurs. There is an ongoing debate between some participants and the California ISO about which of the above interpretations is proper, but in either case, at least one of the larger old steam power plants (typically Hunter's Point 4) and at least three of the old gas turbines are assumed to be in service at the time of the peak load to satisfy California ISO Planning Standards.

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Question 5: Is it the purpose of your testimony to describe the reliability criteria contained in the California ISO Planning Standards and to indicate whether the existing system on the San Francisco Peninsula complies with those criteria?

Response 5: No, it is not. I believe the Jefferson-Martin project proponent and the California ISO will describe in detail the various studies which have been performed to determine if the existing system on the San Francisco Peninsula complies with the reliability criteria contained in the California ISO Planning Standards.

Question 6. Do you believe that if those studies show the existing system will satisfy the reliability criteria contained in the California ISO Planning Standards, that the electric customers on the San Francisco Peninsula will enjoy reliable service equivalent to other areas of California?

Response 6: No not necessarily.

Question 7: Why not?

Response 7: The generating units on the San Francisco peninsula are old and appear to be out of service for extended periods of time. For example, during the last 5 years that I have been consulting with the City and County of San Francisco, I have been included on many phone calls in which the California ISO has notified the City that Potrero 3 or Hunter's Point 4 were out of service, or expected to be out of service, for a prolonged time period. The California ISO would tell the City that, during this prolonged outage, the City would be at elevated risk of a power outage. It is important to consider the reliability of specific generating units because if the actual individual performance of the units is poor enough, the probability of simultaneous outages can be quite high.

Question 8: Do you know what the individual performance statistics are for the generating units in San Francisco?

1 Response 8: No, I do not. We have requested data from the California ISO on the
2 performance of the generating plants within San Francisco and elsewhere throughout the
3 California ISO grid, so that we might be able to make a proper assessment of the correct joint
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6 probability of equipment outages. They have, so far, refused to provide it and have referred us to
7 the data that is publicly available since January 1, 2001 on its web site.

8 Question 9: What is your understanding of the information available on the California
9 ISO web site?

10 Response 9: The web site lists the reported status of many of the power plant units that
11 are connected to the California ISO controlled grid. It lists the reported capacity of the unit, the
12 unit's owner, and the California ISO zone where the unit is located. It also lists the amount of
13 any curtailment and whether it was planned or unplanned. In many instances, both planned and
14 unplanned reasons for the curtailment are listed, with no delineation as to allocation of the
15 amounts for each. The web site lists this data from January 1, 2001 to the present. For most of
16 that period, there were four reports per day. From January 1, 2001 until July 9, 2001, the web
17 site contains one (1) report per day at seventeen (17) different times during that time period. The
18 earliest report is at 8:30 AM and the latest is at 4:37 PM. On July 10, 2001 there were three (3)
19 times that the data was reported. Beginning July 11, 2001, there were four reports per day, at
20 approximately 7:15 AM, 11:15 AM, 3:15 PM and 7:15 PM.

21 Question 10: Have you been able to use the publicly available information located on
22 the California ISO's web site to make your own determination of the relative reliability of power
23 plants in San Francisco, as compared to power plants in other parts of the state?

24 Response 10: Yes I have. I supervised the analysis of the data available from January 1,
25 2001 through September 20, 2003. Excluded from the accumulation of outage data was that the
26 data for 41 days during the period of January 1, 2001 through July 9, 2001 because of
27 insufficient information and format difficulties for those days. We added up the time periods

1 where curtailment occurred and the amount of curtailment. From that data I have produced the
2 following Table 1:

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7 **TABLE 1**

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9 **Accumulated Outage Data For Generation**
10 **as Determined from the California ISO Web Site**

11

12 Units	13 Number of	14 Average	15 Equivalent
<u>San Francisco Peninsula</u>	<u>Curtailments</u>	<u>MW Curtailed</u>	<u>Outage rate</u>
16 Hunters Point Unit 1	977	24	0.14
17 Hunters Point Unit 4	1,977	82	0.30
18 Potrero Unit 3	526	162	0.12
19 Potrero Unit 4	193	40	0.04
20 Potrero Unit 5	627	51	0.18
21 Potrero Unit 6	778	48	0.21
22 United Cogen	<u>119</u>	<u>38</u>	<u>0.04</u>
23 SF Peninsula Total	5,197	68	0.14
24 All other units reported	<u>232,662</u>	<u>105</u>	<u>0.05</u>

25
26 Question 11: How was this table developed?
27

1 Response 11: For each of the records in the database, we added up the number reported
2 for capacity potentially available, in days in which there were outages. We also added up the
3 number of outages and all the megawatts that were reported as curtailed from each unit. I
4 assumed, in time periods of no outage report, that the unit was operating at its average potential
5 available rating. From these data we were able to calculate the average MW curtailed for the
6 unit throughout the time period and the equivalent outage rate. The equivalent outage rate is
7 essentially the per unit amount of capacity from that unit that was unavailable on average
8 throughout the time period. For instance, an equivalent outage rate of 0.25 would indicate on
9 average that unit was available at 75% at its potential generating capacity.

10 Question 12: Is this the best way of predicting overlapping outages on peak?

11 Response 12: No, it is not. One concern I have is that at most, only four snapshots each
12 day are taken rather than recording the starting and ending time of each planned and unplanned
13 outage. This, however, is probably a minor issue since so many samples are available. A more
14 major issue, if one wishes to focus on the probability of overlapping outages on peak and one
15 wishes to assume no units are planned to be out during peak time periods, is that the method of
16 reporting the outage occurrences does not allow that.

17 However, it is also important to note that in some ways, the data including both planned
18 and unplanned outages is very important for the San Francisco Peninsula since its load does not
19 vary throughout the year as much as in other areas of the California ISO grid, where winter loads
20 are much lower than those that appear in the summer.

21 Question 13: Is the data useful for purposes of discussing the relative likelihood of
22 overlapping generation outages in the City?

23 Response 13: Yes it is. Table 1 compares data collected for the City's units with that
24 collected for all units in the database. This clearly shows that the City's units, on average,
25 exhibit inferior performance with an equivalent outage rate of 0.14 as compared to all the other
26 units reported on the California ISO web site with an equivalent outage rate of 0.05. This means
27

1 that the City's units are nearly three times more likely to be unavailable to reliably serve load
2 than the units reported for other areas of the California ISO grid.

3 Question 14: What additional data would be helpful to confirm your impression that the
4 probability of electric power shortages in San Francisco is greater than in most other areas in
5 California?

6 Response 14: Most importantly, one would need outage data on all the units that provide
7 power to the California grid and would need to provide a model of the transmission system to
8 which these generators are connected. One would next need to evaluate all the various states that
9 the generator and transmission system could be in and calculate the probability of adequately
10 serving the load in each region.

11 Question 15: Are you aware of any other studies of power reliability that are helpful in
12 your evaluation of the reliability of power plants in San Francisco?

13 Response 15: Yes. The California Energy Commission reported on power supply
14 shortages in the 2002-2012 Electricity Outlook Report, published in February 2002.

15 Question 16: What did the 2002-2012 report state relative to expected reliable electric
16 service by transmission area (zone) in California?

17 Response 16: Page Seven (7) of the Executive Summary states: "The risks of power
18 supply shortages in 2003 vary for different parts of the state: from little to no risk for Northern
19 and Central California and the largest municipal utilities – LADWP and SMUD, to low risk
20 (about 1%) for Southern California, to a noticeable level of risk (7%) for San Diego, and to a
21 significant level of risk (about 14%) to San Francisco."

22 Question 17: Does the above conclusion by the California Energy Commission surprise
23 you?

24 Response 17: No. The California ISO Planning Standards are deterministic and do not
25 take into account the higher likelihood of multiple generating unit outages in San Francisco as
26 indicated in my earlier summary of publicly available data. Therefore, it is likely that although
27

1 all the areas comprising the California ISO controlled grid are planned according to the same
2 standard, different levels of service reliability can result.

3 Question 18: Do you believe the CEC utilized data specific to San Francisco in their
4 analysis?

5 Response 18: The report contains few details on how the results presented in the report
6 were calculated. However, the report did state on page II-3-3: "Each power unit is characterized
7 by its forced outage rate, the percent of time it will be unavailable when called upon to operate.
8 Forced outage rates, the standard unit performance measured used by the electric industry, are
9 based upon unit-specific performance history and thus vary unit by unit."

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11 Question 19: What do you conclude from the above observations?

12 Response 19: My conclusion is that it is not necessarily sufficient to apply the California
13 ISO Planning Standards to determine whether reliable electric service will be provided to electric
14 consumers on the San Francisco Peninsula. Based upon the above CEC Report, additions to the
15 San Francisco Peninsula transmission system and/or new reliable generation is now needed to
16 provide a level of reliability even close to that enjoyed in other areas of California.

17 Question 20: Will the addition of the Jefferson-Martin 230 kV transmission line
18 increase the reliability of electric service on the San Francisco Peninsula?

19 Response 20: Yes it will. Transmission lines typically have outage rates significantly
20 lower than power plants. The addition of the Jefferson-Martin transmission line will add the
21 capability to import several hundred megawatts of power from outside the San Francisco
22 Peninsula, on a path that is independent of the existing transmission corridor. The beneficial
23 result will be that electric customers on the San Francisco Peninsula will be less dependent on
24 the operation of power plants located on the San Francisco Peninsula.