

Exhibit No.: _____

Commissioner: Henry M. Duque

Administrative Law Judge: Michelle Cooke

Witness: Jeffrey C. Miller and Keith Casey

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

Conditional Application of SAN DIEGO GAS
AND ELECTRIC COMPANY for a Certificate of
Public Convenience and Necessity Authorizing the
Construction of the Valley-Rainbow 500 kV
Transmission Project

Application 01-03-036

**TESTIMONY OF JEFFREY C. MILLER
AND KEITH CASEY ON BEHALF OF
THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR**

Submitted by the California Independent System Operator

October 5, 2001

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TESTIMONY OF JEFFREY C. MILLER AND
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Submitted by the California Independent System Operator

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

14 A. Our names are Jeffrey C. Miller, Regional Transmission Manager of the California
15 Independent System Operator Corporation (CA ISO) and Keith Casey, Manager of Market Analysis
16 and Mitigation in the Department of Market Analysis of the CA ISO. Our statements of qualifications
17 are provided as attachments to this testimony.

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

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

20 Q. What is the purpose of your testimony?

21 A. The purpose of our testimony is to describe the CA ISO's review of and conclusions regarding
22 the need for the Valley-Rainbow Transmission Project. The San Diego Gas and Electric Company
23 (SDG&E) has applied to the California Public Utilities Commission (CPUC) for a Certificate of Public
24 Convenience and Necessity (CPCN) for the project. The CA ISO Governing Board has determined
25 that a 500 kV Project, such as the Valley-Rainbow Transmission Project, is needed (without selecting
26 a preferred near-term alternative, and without regard to routing) to address the identified reliability
27 concerns of the San Diego and southern Orange county portion of the CA ISO grid beginning 2004
28 and directed SDG&E to proceed with design and licensing activities for the proposed project and to

1 include the CA ISO's analysis of the alternatives in its application to the CPUC.¹ October 26, 2000
2 Motion of the CA ISO Governing Board on SDG&E 500 kV Project (Johanson).

3 If no new generation is added in the San Diego area, the Valley-Rainbow Transmission
4 Project is needed in 2005 to meet CA ISO Grid Planning Criteria in the San Diego area. As new
5 generation comes on line, assuming no significant retirements of existing generation, the need for the
6 line to meet CA ISO Grid Planning Criteria can be deferred. However, the Valley-Rainbow
7 Transmission Project still offers important reliability benefits.

8 Moreover, the Valley-Rainbow Transmission Project will likely have important economic
9 value, particularly as, with the addition of significant new generation in the San Diego area and
10 Mexico, the Valley-Rainbow Transmission Project becomes important to make this generation
11 available to Central and Northern California. The economic value of the Valley-Rainbow
12 Transmission Project requires additional assessment. Such assessment should consider the
13 competitive and regional nature of the wholesale electricity market. It should examine in particular,
14 the likely impact of the Project on the development of new generation in the San Diego area, and on
15 market power.

16 Finally, the Valley-Rainbow Transmission Project is an important piece in an overall strategy
17 to improve the 500 kV backbone system in California and the West.

18 Our testimony 1) describes CA ISO proceedings to date in relation the Valley-Rainbow
19 Transmission Project; 2) discusses the reliability benefits of the Valley-Rainbow Transmission Project;
20 3) discusses potential economic benefits of the Valley-Rainbow Transmission Project; 4) briefly
21 describes the CA ISO Grid Planning Process; and 5) describes broad initiatives to review and meet
22 transmission needs and how the Valley-Rainbow Transmission Project fits within these initiatives.

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

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

26 I. PROJECT DESCRIPTION

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28 ¹ Since then, based on revised SDG&E load forecasts, CA ISO Chief Executive Officer Terry Winter agreed that the project in service date could be deferred until 2005. SDG&E has further revised its load forecasts more recently.

1 Q. Please describe Valley-Rainbow Transmission Project.

2 A. The Valley-Rainbow Transmission Project is an interconnection between SDG&E's existing
3 230 kilovolt (kV) transmission system and Southern California Edison Company's (SCE) existing 500
4 kV transmission system. The project is located in northern San Diego County and southwestern
5 Riverside County. The proposed project consists of:

6 1) Construction of a new 500/230/69 kV substation located in Rainbow
7 in northern San Diego County;

8 2) Construction of approximately 31 miles of 500 kV single-circuit
9 overhead transmission line from SCE's existing Valley Substation to
10 the proposed Rainbow substation; and

11 3) Modification of the existing Valley Substation to accommodate the
12 new 500 kV transmission line.

13 In addition, the Valley-Rainbow Transmission Project would add a second 230 kV circuit to
14 the existing Talega-Escondido 230 kV transmission line, rebuild 7.7 miles of 69 kV transmission line
15 between the existing Pala and Lilac Substations, and add voltage support systems to the existing
16 Mission, Miguel, and Sycamore Canyon Substations.

17 II. CA ISO PROCEEDINGS TO DATE REGARDING THE VALLEY-RAINBOW
18 TRANSMISSION PROJECT

19 Q. Please, describe CA ISO proceedings to date regarding the Valley-Rainbow Transmission
20 Project.

21 A. The identification of the need for the Valley-Rainbow Transmission Project grew out of
22 SDG&E's 1999 Expansion Plan for 2000-2004, developed in accordance with section 3.2 of the CA
23 ISO Tariff (attached). The plan identified 1) multiple criteria violations to the CA ISO Grid Planning
24 Criteria (attached) in 2004, 2) that reinforcements to the existing 230 kV system would be exhausted;
25 and 3) that new 500 kV facilities would be needed. Accordingly, a study was undertaken by SDG&E
26 jointly with SCE through an open CA ISO stakeholder process to identify and recommend the
27 preferred transmission solution that could be placed in service by June 2004 and serve load demand
28 while meeting the CA ISO Grid Planning Criteria. The results of the study indicated that the preferred

1 500 kV transmission project is a transmission line between SCE's existing Valley substation and a new
2 SDG&E substation at either the Rainbow or Pala site in northern San Diego County. The Valley-
3 Rainbow Transmission Project was subsequently considered by the CA ISO governing board in a
4 number of meetings. The documents associated with CA ISO governing board meetings are attached.

5 Q. When did the CA ISO governing board first consider the Valley-Rainbow Transmission
6 Project, what issues were considered, and what was the result?

7 A. The CA ISO governing board first considered the Valley-Rainbow Transmission Project in
8 May 2000. At that time, the CA ISO governing board accepted CA ISO management's
9 recommendation that the Project should be approved as the preferred transmission project to address
10 identified reliability concerns on the San Diego and southern Orange County portion of the CA ISO
11 grid beginning in 2004, and that the CA ISO should be directed to undertake a competitive solicitation
12 to allow non-wires alternatives to compete with the project. See May 25, 2000 Motion of the CA ISO
13 Governing Board on SDG&E Valley Rainbow 500 kV Project. The CA ISO governing board directed
14 the CA ISO to define the solicitation process and to submit it to the governing board at the following
15 meeting. Id.

16 Q. When did the CA ISO governing board next consider the Valley-Rainbow Transmission
17 Project, what issues were discussed, and what was the result?

18 A. The CA ISO governing board next considered the Valley-Rainbow Transmission Project on
19 August 1, 2000. At that time, CA ISO management presented further information to the governing
20 board regarding issues requiring resolution in the design of a competitive solicitation, and additional
21 considerations related to seeking non-wires alternatives. CA ISO management stressed in particular
22 the recent distortions in the electricity markets and suggested that 1) "[r]egional transmission projects,
23 such as Valley-Rainbow, are critical infrastructure to ensuring a competitive regional market"; 2)
24 "[w]hile there certainly may be a place for 'competition' between generation and transmission projects
25 at a local level ..., any tangible short-term benefit resulting from a generating project deferring or
26 displacing a larger regional transmission project is likely to be outweighed by the less tangible costs of
27 reduced access and therefore less competition"; and 3) "reliance on 'market' generation to displace the
28 need for critical regional transmission facilities will inevitably give rise to market power problems and

1 the need to 'negotiate' a deal with such generation on a long term basis." July 25, 2000, Memorandum
2 to the CA ISO Board of Governors regarding Recommendation on Competitive Solicitation of
3 SDG&E's Valley-Rainbow 500 kV Transmission Project at 2.

4 In addition, CA ISO management discussed some of the limitations of non-wires alternatives to
5 address the reliability concerns in the San Diego area. Management noted that a generation project
6 that could possibly displace the Valley-Rainbow Transmission Project would also displace imports in
7 the area and would thus not increase load serving capability in the amount of installed capacity. As a
8 result, a significant amount of energy dispatch would be required from both the South Bay and Encina
9 power plants to eliminate reliability criteria violations and support full output from the proposed plant.
10 Id.

11 CA ISO management then outlined a number of policy issues that would have to be resolved if
12 the CA ISO proceeded with a competitive solicitation including: 1) whether payments should be
13 limited to locational incentives; 2) whether a "deferral" time period should be specified; and 3) how
14 the costs of non-wires alternatives should be recovered. Id.

15 The CA ISO Department of Market Analysis (DMA) indicated that it was reviewing long-term
16 grid planning issues to better understand whether sufficient market incentives exist to induce grid
17 expansion with grid-wide benefits. DMA noted that the "Valley Rainbow project is a good example of
18 a project that enhances the backbone grid and will provide system-wide benefits." DMA noted that
19 the project "immediately increases access to the San Diego area markets, provides a first step to an
20 integrated approach in upgrading the Southern California 500 kV backbone system and may reduce
21 reliance on San Diego area RMR units (and thus promote competition by reducing the market power
22 of generators needed to ensure system reliability)." Id. DMA recommended as a general policy that
23 "once the [CA] ISO determines that the benefits of a given transmission project outweigh its costs and
24 that the project is the most cost-effective way to meet the identified need, the [CA] ISO should limit
25 the solicitation of non-wires alternatives to transmission projects that are not part of the backbone
26 transmission system." Id.

27 The CA ISO governing board directed management not to proceed with the competitive
28 solicitation, to confirm that the Valley-Rainbow Transmission Project is needed, and to authorize

1 SDG&E to proceed with the process of getting the line constructed. August 1, 2000, CA ISO
2 governing board motion on SDG&E Valley Rainbow Project.

3 Q. When did the CA ISO governing board next consider the Valley-Rainbow Transmission
4 Project, what issues were discussed, and what was the result?

5 A. At the October 26, 2000, CA ISO governing board meeting, CA ISO governing board member
6 Karen Johanson asked the governing board to reconsider its August decision to dispense with a
7 competitive solicitation. As a result, the governing board rescinded its two prior motions and passed a
8 new motion 1) finding that a 500 kV Project, such as the Valley-Rainbow project, is needed (without
9 selecting a preferred near-term alternative and without regard to routing); 2) directing the CA ISO to
10 work with the CPUC to develop a competitive solicitation for non-wires alternatives for consideration
11 by the CPUC, and 3) requesting the CA ISO to further define the solicitation process and present it to
12 the CA ISO governing board in January 2001. See October 26, 2000, CA ISO governing board
13 motion on SDG&E 500 kV Project (Johanson).

14 Q. Did the CA ISO governing board consider a solicitation process in January 2001?

15 A. No. The CA ISO consulted with the CPUC California Environmental Quality Act (CEQA)
16 staff on how a competitive solicitation process could be undertaken, and coordinated with the CPUC's
17 process to evaluate the environmental impacts of the Valley-Rainbow Transmission Project and
18 alternatives to the project in accordance with CEQA. The CA ISO summarized these discussions and
19 proposed a process for the solicitation and criteria for evaluation of responses by the CA ISO in a
20 January 16, 2001 memorandum to the governing board on Status on Valley-Rainbow RFP. However,
21 the CA ISO stakeholder governing board was replaced by a governing board appointed by Governor
22 Davis at the beginning of 2001. The new CA ISO governing board had other priorities in its initial
23 months in office.

24 Q. Has the new CA ISO governing board considered the need for the Valley-Rainbow
25 Transmission Project and the appropriateness of a competitive solicitation process?

26 A. Yes. The new CA ISO governing board considered the Valley-Rainbow Transmission Project
27 on March 30, 2001. At that time, CA ISO management advised the governing board that whereas the
28 project was initially conceived to meet load growth in San Diego, the Valley-Rainbow Transmission

1 Project should in addition be evaluated in light of a broad strategy by the State of California to put into
2 place a robust transmission system to support reliable service to consumers. March 23, 2001
3 memorandum to the CA ISO Board of Governors regarding Valley-Rainbow Transmission Project.
4 CA ISO management suggested that a competitive solicitation was inconsistent with the new state
5 strategy. CA ISO explained that notwithstanding a reduction in projected load growth in San Diego
6 and proposed new generation, SDG&E and the CA ISO agreed that a 2004 in service date was still
7 appropriate given uncertainty as to whether and when proposed generation would be in service. Id.

8 The new CA ISO governing board reaffirmed the portion of the October 26, 2000 CA ISO
9 governing board motion that found need for a 500 kV project such as the Valley-Rainbow
10 Transmission Project but rescinded the direction in the October 26, 2000 governing board motion that
11 required the CA ISO to proceed with a competitive solicitation. March 30, 2001, CA ISO governing
12 board motion on Valley-Rainbow Project (attached).

13 Q. Have there been any further CA ISO proceedings regarding the Valley-Rainbow Transmission
14 Project?

15 A. Yes. Recently, CA ISO Chief Executive Officer Terry Winter agreed with SDG&E that in
16 light of further reductions in the load forecast for San Diego, the in-service date for the Valley-
17 Rainbow Transmission Project could be deferred to 2005. SDG&E has further reduced its load
18 forecast since then.

19 Q. Are further proceedings related to the Valley-Rainbow Transmission Project appropriate?

20 A. Yes. As described further in this testimony, the CA ISO considers that further assessment of
21 the economic benefits of the Valley-Rainbow Transmission Project is appropriate. The CA ISO is in
22 the process of developing a methodology to assess the economic value of transmission projects that
23 considers regional and competitive benefits. The CA ISO considers that the economic assessment
24 performed regarding Valley-Rainbow Transmission Project to date does not adequately consider and
25 quantify these benefits.

26 III. RELIABILITY BENEFITS

27 Q. What are the reliability benefits of the Valley-Rainbow Transmission Project?

28 A. Based on SDG&E's newest load forecast that was published today (October 5, 2001) and an

1 assumption that there will be energy available to fill SDG&E ties, the Valley-Rainbow Transmission
2 Project would be needed to meet CA ISO Grid Planning Criteria in 2005, assuming that no additional
3 generation is developed in the SDG&E area. However, if the summer peaker contracts are not renewed
4 (some of them expire in 2003), the Project would be needed in 2004. The need for the Project to meet
5 CA ISO Grid Planning Criteria would be deferred as new generation comes on line. However, the
6 Project provides reliability benefits other than strict compliance with CA ISO Grid Planning Criteria,
7 that complement the potential economic benefits described below.

8 Q. Please describe the requirements in the CA ISO Grid Planning Criteria.

9 A. The CA ISO Grid Planning Criteria require that the system be capable of meeting projected
10 load under normal conditions with all facilities in service; that is the system should be capable of
11 meeting peak load without resorting to involuntary load curtailments. In addition, CA ISO Grid
12 Planning Criteria require that the system be capable of meeting projected load under single
13 contingencies (with the largest single transmission element out of service) and the largest generating
14 unit out of service.

15 Q. Please describe the load forecast used by the CA ISO to assess the reliability benefits of the
16 Valley- Rainbow Transmission Project and the level of CA ISO review of this forecast.

17 A. The CA ISO initially assessed the need for the Valley- Rainbow Transmission Project in late
18 1999 and early 2000 in the context of the annual grid planning process. At that time, the CA ISO
19 followed its usual practice of reviewing utility load forecasts for reasonability considering historic load
20 growth and other factors. Since that time, SDG&E has revised its load forecasts several times to
21 reflect new market conditions such as increases in electricity prices and energy conservation. The CA
22 ISO has not closely reviewed these new load forecasts. The CA ISO, in preparing this testimony, has
23 relied on the latest SDG&E load forecast information provided to the CA ISO today which projects
24 that total system load in the San Diego area including losses is expected to reach 4355 MWs in 2004
25 and 4520 MWs in 2005.

26 Q. Please describe the current generation and available import levels in the San Diego area.

27 The total generating capacity in the SDG&E system prior to summer 2001 was 2107 MW.
28 During summer 2001, 236 MWs of peaking generation came on line for a total of 2343 MWs.

1 In considering resources available to meet load, it is also necessary to include available import
2 capability. Import capability into San Diego currently includes 2200 MWs from Central and Northern
3 California at the San Onofre tie, 408 MW from Mexico over Path 45, and 970 MWs over the
4 Southwest Power Link (SWPL). Import capability adds 2850 MW to resources to meet San Diego
5 load since imports over all paths are controlled by an import nomogram. Thus, the total resources plus
6 available import capability to meet load without new generation is currently 2850 MWs + 2343 MWs
7 or 5193 MWs. For CA ISO Grid planning purposes, the 5193 MWs have to be derated to take into
8 account the effects of the worst transmission line (SWPL) out of service and the largest generator
9 (Encina Units 5 = 330 MWs) out of service.

10 Q. If no new generation develops in the San Diego area, what are the reliability benefits of the
11 Valley- Rainbow Transmission Project in 2004 and 2005?

12 A. If no new generation develops in the San Diego area, and import capability is available and
13 energy can be procured to fill the ties into SDG&E, the Valley-Rainbow Transmission Project would
14 be needed to meet CA ISO Grid Planning Criteria in 2005. The CA ISO Grid Planning Criteria
15 requires that the load be served with the largest unit on the system (Encina Unit 5=330 MWs) out of
16 service and the largest single transmission line contingency, an outage of SWPL. The loss of SWPL
17 causes the simultaneous import capability into SG&E to drop from 2850 MWs to 2500 MWs.
18 Therefore the resources available to meet load would be 5193 MWs minus the 330 MWs from Encina
19 5 and minus 350 MWs due to the simultaneous import nomogram derate, or 4513 MWs. The latest
20 SDG&E load forecast is 4355 MWs in 2004 and 4520 MWs in 2005. Accordingly, assuming that no
21 new generation comes on line, the Valley-Rainbow Transmission Project would be needed to meet CA
22 ISO Grid Planning Criteria in 2005. However, if the summer peakers contracts that expire in 3 years
23 are not renewed, the project would be needed to meet CA ISO Grid Planning Criteria in 2004.

24 Q. Why was the project initially recommended to meet reliability needs for SDG&E?

25 At the time that SDG&E and the CA ISO initially considered the need for the Valley-Rainbow
26 Transmission Project, much of the new generation that is currently proposed had not yet been
27 conceived or was highly speculative and SDG&E's load forecast was significantly higher. Thus,
28 studies performed by SDG&E focussed on identifying the best transmission alternative to meet the

1 deficiency in system load serving capability. These studies showed that based on comparison of
2 project reliability, cost effectiveness and construction feasibility of several alternatives the Valley-
3 Rainbow Transmission Project was the preferred alternative for increasing SDG&E import capability.

4 A number of facts supported this conclusion. First, without the Valley-Rainbow Transmission
5 Project, the SDG&E system would need many lower voltage upgrades. Also, all practical 230 kV
6 alternatives of upgrading the system have been exhausted. Therefore, after comprehensive studies,
7 the Valley-Rainbow Transmission Project was found to be the optimal option for an upgrade.

8 Q. Is it reasonable to assume that no new generation will develop in the San Diego and Mexico
9 area?

10 A. No. The CA ISO acknowledges that there are generation additions planned in the San Diego
11 area that are relatively certain. As noted earlier, based on this recognition, CA ISO Chief Executive
12 Officer Terry Winter recently recognized that the reliability need for the Valley- Rainbow
13 Transmission Project could be safely deferred until 2005. This was before the latest revision in
14 SDG&E's load forecast.

15 Q. What level of new generation should be considered in assessing the need for a transmission
16 project?

17 A. Standard industry practice, used in the CA ISO grid planning process, is to consider new
18 generating projects that have been permitted by the California Energy Commission (CEC). This
19 includes both units that are under construction and units that have been permitted but have not yet
20 begun construction. In addition, it is useful to consider a range of possible alternatives to understand
21 the risks to reliability from the alternatives.

22 Q. What is the level of new generating units that have been permitted by the CEC in the San
23 Diego area?

24 An additional 147 MWs of new peaking units is expected to come on line in 2001. One
25 additional plant has been permitted and is expected to come on line in 2003, the 510 MW plant at
26 Otay-Mesa.² As a result of these additions, 657 MWs of additional generation can be assumed to be

27 ² An additional plant, the 500 MW plant connected to the La Rosita Substation in Northern Mexico has also
28 been permitted. The CA ISO is not aware of the extent to which the output from this plant would be available
to customers in San Diego and accordingly did not include it in its calculations.

1 available to meet load in San Diego in 2004 bringing the total level of generation in San Diego to 3000
2 MWs (657+2343).

3 Q. With this level of generation, what are the total resources available to meet load?

4 A. As described earlier, system import capability must be added to available generation to
5 determine the level of resources available to meet load. Thus, 2500 MW of import capability,
6 assuming the SWPL outage, must be added to 3000 MWs of generation in the San Diego area for a
7 total of 5500 MWs and then we must subtract 330 MWs (for an outage of Encina 5) resulting in 5170
8 MWs available to serve the load. A word of caution is that import capability does not mean that energy
9 will be available, only that if it is available there would be sufficient transmission capacity available to
10 deliver it to serve San Diego load.

11 Q. Given this level of projected new generation, what are the reliability benefits of the Valley-
12 Rainbow Transmission Project?

13 A. With the addition of 657 MWs of new generation in the San Diego area, the system will meet
14 CA ISO Grid Planning criteria in 2004 and 2005. With these assumptions 5170 MWs would be
15 available to meet the projected load in 2005 of 4520 MWs. However, the Valley-Rainbow
16 Transmission Project provides additional reliability benefits (described below) beyond strict
17 compliance with the CA ISO Grid Planning Criteria.

18 Q. What is the total level of announced new generation in the San Diego area?

19 A. The total level of announced new generation in San Diego includes generation that has not
20 been permitted, some of which is highly speculative. The total level of projected new generation in
21 San Diego includes: 147 MWs in 2001; 640 MWs in 2002; 3392 MWs in 2003; 1045 MWs in 2004;
22 and 2470 MWs in 2005.

23 Q. Does the Valley-Rainbow Transmission Project have any value if all the announced new
24 generation in San Diego develops?

25 A. Yes. The Valley-Rainbow Transmission Project would be useful to export significant excess
26 power from the San Diego area to Central and Northern California. Moreover, the Valley-Rainbow
27 Transmission Project would still provide significant reliability benefits even in this scenario.

28 The Valley-Rainbow Transmission Project would provide a third, independent major point of

1 interconnection for the San Diego transmission system to the rest of the grid, in addition to the existing
2 San Onofre and SWPL³. In case of an outage of one interconnection (for example SWPL) without the
3 Valley-Rainbow Transmission Project, San Diego would have only one point of interconnection (at
4 SONGS) with the rest of the WSCC interconnected system. Therefore, adding generation and
5 upgrading of the 230 kV and the lower voltage systems, would not provide the same level of reliability
6 as the Valley-Rainbow Transmission Project.

7 Thus, in any generation development scenario, the Valley-Rainbow Transmission Project will
8 provide a more robust transmission system that will help to guard San Diego and the rest of California
9 against potential reliability impacts such as the loss of a major power plant (i.e., 2150 MWs at San
10 Onofre), a substantial reduction in gas supply to the generation resources in the area, or a major
11 disruption in the area from a natural event such as an earthquake. While each of these events have
12 different probabilities of occurrence, their consequences could be substantial and the Valley-Rainbow
13 Transmission Project could reduce or eliminate these impacts.

14 Loss of a major power plant, particularly San Onofre, is also critical from a voltage stability
15 perspective. Under summer peak load conditions, especially in the event of a SWPL outage, in
16 addition to transmission line thermal overloadings, there is a significant risk of voltage collapse. By
17 providing another transmission path to the San Diego system, the Valley-Rainbow Project would
18 mitigate these problems.

19 IV. POTENTIAL ECONOMIC BENEFITS

20 Q. Does the Valley-Rainbow Transmission Project offer economic benefits?

21 A. Yes. The CA ISO considers that the Valley-Rainbow Transmission Project will offer
22 economic benefits including providing an incentive for new generation development in California,
23 mitigating market power and promoting supply diversity. The CA ISO has not undertaken a detailed
24 study of these benefits, thus this testimony discusses these potential benefits qualitatively. A thorough
25 quantitative study of these benefits would be appropriate to properly assess the economic value of the
26 Valley-Rainbow Transmission Project.

27
28 ³ While the San Diego area is also connected to Mexico through Path 45, this interconnection is to a radial part
of the Mexican system and is hence not typically considered a major interconnection to the rest of the grid.

1 Q. Why hasn't the CA ISO undertaken a thorough quantitative analysis of the economic benefits
2 of the Valley Rainbow Transmission Project?

3 A. The Valley-Rainbow Transmission Project was initially considered by the CA ISO as a
4 projected that was critically needed for reliability. Accordingly, review of the project by the CA ISO
5 did not include an in-depth economic assessment. With projected generation additions and reductions
6 in SDG&E's load forecast, the risk of violations of CA ISO Grid Planning Criteria has been
7 substantially reduced, although the Valley-Rainbow Transmission Project continues to offer
8 significant reliability benefits as is discussed above. Nonetheless, the changes in reliability
9 considerations highlight the importance of economic considerations.

10 At this time, the CA ISO is in the process of working with state agencies (the CPUC,
11 Electricity Oversight Board, and the CEC) and the investor owned utilities (SDG&E, SCE and Pacific
12 Gas and Electric Company) to develop a methodology to assess economic benefits of major new
13 transmission upgrades. The CA ISO with the utilities and state agencies has selected a consultant to
14 assist in this effort. Initial ideas are expected to emerge by January 2002 and a final report should be
15 completed by March 2002. The CA ISO considers that the outcome of this effort would assist in the
16 quantification of the economic benefits of the Valley-Rainbow Transmission Project.

17 The CA ISO understands that SDG&E has undertaken an initial study of the economic benefits
18 of the Valley-Rainbow Transmission Project. The CA ISO has reviewed the initial results of this
19 study. The CA ISO considers that the potential benefits discussed qualitatively in this testimony are
20 not adequately reflected in the SDG&E study. Thus, the CA ISO considers that additional economic
21 assessment of the Valley-Rainbow Transmission Project would be beneficial, particularly
22 incorporating the ideas that result from the development of a methodology for economic assessments
23 of transmission facilities.

24 Q. Please describe the potential economic benefits of the Valley-Rainbow Transmission Project as
25 an incentive for the development of new generation in California.

26 A. Transmission access to regional markets and access to natural gas supplies are two of the
27 primary factors driving the siting of new power plants. San Diego's natural gas infrastructure is
28 substantial and has attracted a significant number of new generation projects. As described above,

1 there is a significant level of proposed new generation in the San Diego area. If the Valley- Rainbow
2 Transmission Project is not completed, generation developers may reconsider proposed generation
3 projects for San Diego and choose to move these projects elsewhere or perhaps to not build them at all.
4 While the CA ISO has not undertaken a formal analysis to estimate how likely or significant this
5 impact would be, it seems reasonable to expect that without adequate transmission infrastructure for
6 exporting power out of the San Diego area, some developers will choose not to proceed with proposed
7 new projects in San Diego. This could have detrimental economic impacts on SDG&E customers
8 since they will be more reliant on existing older plants within San Diego that have higher operating
9 costs. There may also be additional reliability costs if the lack of new generation investment in the
10 San Diego area results in the need to maintain Reliability Must-Run contracts with existing generation.

11 Moreover, if failure to build the Valley-Rainbow Transmission Project results in less new
12 generation being built throughout the Western System Coordinating Council (WSCC) area (i.e.
13 generation projects proposed for San Diego prove not to be economically viable elsewhere in
14 California or the rest of the WSCC due to less favorable siting factors such as natural gas
15 infrastructure⁴), there may be a detrimental cost impact to load throughout the WSCC.

16 Q. Please describe the potential economic benefits of the Valley-Rainbow Transmission Project to
17 mitigate market power.

18 A. By providing San Diego with greater access to regional markets to the north and by providing
19 greater access by Central and Northern California to generation in San Diego and Mexico, the Valley-
20 Rainbow Transmission Project will help to mitigate market power in California's wholesale energy
21 markets. The broader benefits of a robust transmission system are increased competition among
22 suppliers and, presumably, lower prices for critical services. Absent sufficient transmission capacity,
23 customers may not have adequate access to alternative suppliers and may be forced to buy from
24 strategically located suppliers who can demand high prices for energy and other services. Simply
25 ensuring that enough generation capacity is built to meet demand is not sufficient to mitigate against
26 market power when ownership of that capacity is fairly concentrated.

27 _____
28 ⁴ San Diego may have a comparative advantage in other siting factors as well such as land availability, access to
cooling water, environmental considerations, and ease of siting approvals. If these advantages are significant,
generation projects that are economically viable in San Diego may not be viable elsewhere.

1 The CA ISO has undertaken numerous studies that show when a supplier is “pivotal” in the
2 market (i.e. demand cannot be met absent that supplier’s capacity) that supplier can exercise
3 significant market power. Given the tight supply margins that California experienced in year 2000,
4 suppliers were frequently pivotal and as a consequence market power was substantial and frequently
5 exercised.

6 The fact that more generation is being built in California and that overall supply margins are
7 apt to improve does not necessarily mean that market power will go away, particularly since many of
8 the proposed projects are proposed by existing generation owners. In fact, the CA ISO recently filed
9 with the CPUC, as part of its testimony supporting Pacific Gas and Electric Company's application for
10 a CPCN to expand Path 15, a study that indicated that market power may be significant in northern
11 California in 2005 despite the addition of a large amount of new generation. The study also showed
12 that the expansion of Path 15 would provide a substantial cost saving to load by mitigating the ability
13 of suppliers in northern California to exercise market power. In particular, the study found that using
14 reasonable assumptions, the \$300 million cost of upgrading Path 15 could potentially be recovered in
15 within one drought year, plus three normal years.

16 As discussed above, the CA ISO has not had an opportunity to conduct a similar analysis for
17 the Valley-Rainbow Transmission Project. Nonetheless, the results of the Path 15 analysis indicate
18 that the market power mitigation benefits of a major transmission upgrade can be very significant.

19 Q. Please describe the potential economic benefits of the Valley-Rainbow Transmission Project as
20 a means to ensure greater supply diversity.

21 A. The Valley-Rainbow Transmission Project would strengthen San Diego's links to the rest of
22 the WSCC system. In addition, the project is also part of a broader plan to build a more robust 500 kV
23 backbone system in the WSCC. Stronger regional interconnections provide better access to energy
24 from a diverse portfolio of generation resources rather than being overly dependent on generation
25 fueled by natural gas. Almost all of the new generation being proposed for California and the
26 Southwest are gas-fired. When load is overly dependent on generation using the same fuel type, it is
27 susceptible to the price risk of that fuel type. In the case of natural gas, whether the natural gas
28 infrastructure (pipelines and storage) will keep pace with the growing demand from new natural gas-

1 fire generation being built throughout the West remains to be seen. If it does not and natural gas
2 supplies are frequently tight, higher gas prices will translate into higher energy prices for California
3 load absent access to energy produced by alternative fuel types such as hydro. By providing greater
4 regional access to San Diego users, the Valley-Rainbow Transmission Project will help ensure that
5 San Diego customers have access to a more diverse portfolio of generation resources, which should
6 ultimately reduce price risks. The benefits from supply diversity are apt to be particularly significant
7 when the Valley-Rainbow Transmission Project is viewed in the context of being an integral
8 component of a broader plan to strengthen the 500 kV backbone system in California and throughout
9 the WSCC.

10 V. SUMMARY OF CA ISO TRANSMISSION PLANNING PROCESS

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

13 A. Pursuant to the provisions of Assembly Bill 1890 (AB 1890), the CA ISO is charged with
14 maintaining the reliability of the CA ISO Controlled Grid. The CA ISO Controlled Grid is comprised
15 of transmission facilities and rights turned over to the CA ISO's Operational Control by SDG&E,
16 SCE, Pacifico Gas & Electric Company and the City of Vernon, California (collectively, the
17 Participating Transmission Owners or Participating TOs). Concomitant with the CA ISO's
18 responsibility to maintain system reliability, the CA ISO is also charged with planning and expanding
19 the CA ISO Controlled Grid so as to ensure a reliable and efficient transmission system. These
20 functions and responsibilities are codified in the CA ISO Tariff, which is on file and available for
21 public inspection at FERC.

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

23 A. Because transmission planning and expansion are important elements of maintaining reliability
24 and ensuring the efficient use of the CA ISO Controlled Grid, the CA ISO Tariff (CA ISO Tariff
25 section 3.2) and each Participating TO's Transmission Owner (TO) tariff provide for a coordinated
26 planning process. As described further below, the coordinated planning process requires that, each
27 year, the CA ISO and the Participating TOs assess the adequacy of the CA ISO Controlled Grid and
28 determine whether additional facilities are required to ensure that energy can be reliably and

1 efficiently delivered to load.

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

3 A. The CA ISO Tariff requires Participating TOs to identify, plan and construct transmission
4 additions within their Service Areas that are determined to be needed. A transmission addition is
5 deemed to be needed if it would promote economic efficiency or is necessary to maintain system
6 reliability. Section 3.2 of the CA ISO categorizes and identifies those projects necessary to reliably
7 deliver energy to load as “reliability driven” transmission projects and those projects deemed to be
8 necessary on grounds of maximizing the efficiency of the CA ISO Controlled Grid as “economic”
9 transmission projects.

10 Reliability-driven projects are deemed to be needed if they are necessary to satisfy specified
11 reliability criteria. The CA ISO coordinates the planning of modifications to the CA ISO Controlled
12 Grid to ensure that, at a minimum, they meet the CA ISO Grid Planning Criteria. The CA ISO Grid
13 Planning Criteria incorporate the Western Systems Coordinating Council (WSCC) Reliability Criteria,
14 the North American Electric Reliability Council (NERC) Planning Standards, and local area reliability
15 criteria. Economic projects are deemed to be needed if either the project sponsor commits to pay for
16 the cost of the project or has proposed a cost-allocation methodology that assigns the cost of such
17 project to the identified beneficiaries of the proposed project (subject to the CA ISO’s dispute
18 resolution procedures).

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

23 Importantly, the CA ISO coordinated planning process is flexible in that transmission projects
24 can be proposed by a variety of entities, including the Participating TOs, the CA ISO or any entity
25 who participates in the Energy marketplace through the buying, selling, transmission or distribution of
26 Energy or Ancillary Services. Thus, any Market Participant can step forward to become the sponsor
27 of a transmission project. Having all these interests participate in the planning process is expected to
28 facilitate the development of a CA ISO Controlled Grid that best meets the needs of all its users and

1 maximizes the potential benefits to the State of California.

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

3 A. The CA ISO coordinated planning process includes an annual planning process to identify
4 necessary transmission projects and expansions. Participating TOs are required to develop, and submit
5 to the CA ISO, annual transmission expansion plans for the portion of the grid owned by the
6 Participating TO. These plans describe the facility additions proposed by a Participating TO over a
7 minimum five-year planning horizon, although recently the CA ISO has required Participating TOs to
8 consider a longer period. The annual transmission expansion plans submitted by the Participating TOs
9 identify those areas of the transmission system where enhancements are necessary to satisfy the
10 applicable reliability criteria and evaluate the technical merits of various transmission, generation and
11 operating solutions. The annual planning process is open to all Market Participants and is the forum in
12 which their concerns and proposed projects can be considered. The CA ISO reviews the Participating
13 TO's annual transmission expansion plans for adequacy. If the CA ISO finds that a plan does not meet
14 the CA ISO Grid Planning Criteria, or the CA ISO identifies solutions that would be preferable
15 compared to those proposed by a Participating TO, the CA ISO provides comments and may propose
16 changes or additions to a Participating TO's annual plan. Disagreements between the CA ISO and a
17 Participating TO related to a change or addition to the plan proposed by the CA ISO are subject to the
18 alternative dispute resolution procedures set forth in the CA ISO Tariff.

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

21 A. Review by the CA ISO primarily focuses on whether the projects included in Participating TOs
22 annual transmission expansion plans (including and taking into account new generator
23 interconnections) meet the CA ISO Grid Planning Criteria. In addition, the CA ISO conducts an
24 operational review to ensure that projects meet the CA ISO's need for operational flexibility and the
25 CA ISO requirements for proper integration with the CA ISO Controlled Grid. Finally, the CA ISO
26 examines and reviews the Participating TO's annual transmission expansion plans including new
27 requests for interconnection to the CA ISO Controlled Grid, with the aim to develop an integrated
28 transmission plan for the entire CA ISO Controlled Grid. In this context the CA ISO may develop and

1 recommend projects that are part of a larger regional expansion plan or necessary to integrate the plans
2 of the Participating TOs.

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

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

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

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

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

25 Q. Please explain.

26 A. At its most basic level, the CA ISO is charged with providing open, non-discriminatory and
27 reliable transmission service to all users of the transmission system. In theory, the provision of open
28 and non-discriminatory transmission service will ensure that all Market Participants have access to

1 alternative suppliers of various services and new customers and thus facilitate a competitive market for
2 these services and customers. Obviously, in order to accommodate such access, a transmission system
3 must be robust and reliable. Thus, in order to satisfy its most basic responsibilities, the CA ISO must
4 ensure that the CA ISO Controlled Grid is expanded in a manner that ensures that all customers have
5 fair and non-discriminatory access to the transmission system and that the transmission system
6 provides access to new and alternative suppliers of critical services.

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

9 A. Most certainly. In FERC's Order No. 2000 regarding the formation of Regional Transmission
10 organizations (RTOs), FERC identified "Transmission Planning and Expansion" as one of eight
11 critical functions of an RTO. FERC stated that an RTO must have ultimate responsibility for both
12 transmission planning and expansion to enable it to provide "efficient, reliable and non-discriminatory
13 service." (89 FERC ¶ 61,285 at 485). More recently, in reviewing PJM's RTO filing, FERC stressed
14 that in undertaking its RTO planning responsibilities, PJM must go beyond maintaining reliability, and
15 must identify projects that "expand trading opportunities, better integrate the grid, and alleviate
16 congestion that may enhance market power." 96 FERC ¶ 61,061, 61,240. FERC explained that
17 although maintaining reliability in an economic and environmentally acceptable manner is an
18 important objective, "the focus of an RTO regional plan that supports the development of a
19 competitive bulk power market must be broader", . . . "planning protocols must fully explain how the
20 RTO 'will pursue infrastructure investment that will make generation markets more competitive.'" Id.

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

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

28 Q. Has the CA ISO undertaken a detailed economic assessment of a major transmission project

1 before?

2 A. Yes. As described above, the CA ISO has undertaken an economic analysis of the benefits of
3 reinforcing Path 15, and is in the process of developing a more formal methodology to assess
4 transmission projects from an economic standpoint, cooperatively with the CPUC, the CEC, the
5 Electricity Oversight Board and the utilities.

6 VI. VALLEY-RAINBOW AS A COMPONENT OF A ROBUST 500KV TRANSMISSION
7 BACKBONE

8 Q. How does constructing the Valley-Rainbow Transmission Project fit within broader initiatives
9 to strengthen the transmission system in California and the West?

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

14 ?? In September 2000, the California Legislature passed AB 970 which requires the California Public
15 Utilities Commission and the CA ISO to work together to "[i]dentify and undertake those actions
16 necessary to reduce or remove constraints on the state's existing electrical transmission . . .
17 system" and to "give first priority to those geographical regions where congestion reduces or
18 impedes electrical transmission and supply";

19 ?? On May 16, 2001, the FERC issued an order highlighting the importance of upgrading the
20 transmission system and offering an improved rate of return for certain transmission projects that
21 improve transfer capability;

22 ?? Earlier this year, the Western Governors Association (WGA) convened a group of experts to
23 identify transmission projects necessary to support a robust competitive market. A WGA
24 sponsored study was completed in August. California participated in the study through
25 representatives from the CEC, the CPUC, the CA ISO, and others. The Valley-Rainbow
26 Transmission Project was one of the projects assumed to be in place for purposes of determining
27 the need for additional facilities.

28 Simultaneously with these broad initiatives that are underway in the Legislature, FERC, and

1 the WGA, the CA ISO has been working with state agencies and utilities to develop a broad vision for
2 a robust transmission system for the state. In particular, the CA ISO has begun developing a vision
3 of an adequate 500 kV backbone transmission system. Several key projects have been identified and
4 the Valley-Rainbow Transmission Project has been determined to be one of the highest priority
5 projects. There are also plans to increase the transmission capability on Path 15 and between the SCE
6 and the Pacific Gas and Electric Company transmission systems on Path 26. In addition, to enhance
7 the reliability of service to the San Francisco and Fresno areas, studies are underway to review adding
8 major new 500 kV substations in those areas.

9 The Valley-Rainbow Transmission Project should be viewed as an integral part of a much
10 broader effort to put into place a robust high-voltage transmission system that supports cost-effective
11 and reliable electric service in California and a broader and deeper regional electricity market. Thus, it
12 the economic value of the should also be considered in the context of a broader regional plan that links
13 together a number of key transmission projects, which in the end would create the necessary
14 transmission infrastructure for California and the rest of the West to fully realize the long-term
15 benefits of a competitive regional electricity market.

16 The Valley-Rainbow Transmission Project is one of the elements of a long-term transmission
17 plan that would strengthen the transmission links between Southern California and Desert Southwest.
18 It will provide a direct 500 kV connection between San Diego and the rest of California, which is
19 presently absent. Other phases of the overall plan that are being considered include construction of a
20 500 kV transmission line between Rainbow and Miguel Substations and building a second 500 kV line
21 between Southern California and Arizona. As a result of the long-term plan, San Diego would get
22 access to the generation located outside of the SDG&E territory, including generation in Mexico and
23 Arizona. The Valley-Rainbow Transmission Project is thus one of the portion of a larger overall 500
24 kV transmission plan.

25 Q. Thank-you. I have no further questions.
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1 STATEMENT OF QUALIFICATIONS OF JEFFREY C. MILLER

2
3 Q. Please state your name and business address.

4 A. My name is Jeffrey C. Miller. My business address is California Independent System
5 Operator, 151 Blue Ravine Road, Folsom, CA 95630

6 Q. Briefly describe your responsibilities at the California Independent System Operator.

7 A. I am a Regional Transmission Manager in the Grid Planning Department at the CA ISO. I
8 manage a group of five grid planning engineers that are responsible for reviewing and approving all
9 new generator interconnection requests. In addition, my group is responsible for identifying the
10 transmission facility additions that are required for one half of the CA ISO Controlled Grid.

11 Q. Please summarize your educational and professional background.

12 A. I received a Master of Science degree in Electrical Engineering from Ohio State University in
13 1981. After graduation I worked for the American Electric Power Service Corporation (AEP) in
14 Columbus Ohio in their Bulk Transmission Planning Department. My responsibilities included
15 planning 345 kV and 765 kV transmission facilities and representing AEP on NERC's ECAR Region
16 Future System Study Group.

17 In 1985, I left AEP to join the Western Area Power Administration (Western) in Sacramento
18 California. My primary responsibility at Western was to lead a study group responsible for planning
19 the California-Oregon Transmission Project, which consists primarily of a new 340-mile 500 kV
20 transmission line from the California-Oregon border to Tracy California, near San Francisco. In 1987,
21 I left Western to join the Sacramento Municipal Utility District (SMUD) as a Senior Transmission
22 Planning Engineer and later became SMUD's Supervisor of Transmission Planning. While at SMUD I
23 held a number of responsible positions in various Electric industry organizations such as: chairman of
24 the Western Regional Transmission Association (WRTA) Planning Committee; WRTA board
25 member; member of the WSCC Planning Coordination Committee; and chairman of the WSCC
26 Reliability Subcommittee which develops WSCC's Planning Standards.

27 In 1997 I left SMUD to join the CA ISO as a Regional Transmission Manager. I have over 20
28 years experience in electric transmission system planning.

1 Q. Does this conclude your statement of qualifications?

2 A. Yes.

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1 STATEMENT QUALIFICATIONS OF KEITH CASEY

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3 Q. Please state your name and business address.

4 A. My name is Keith Casey. My business address is California Independent System Operator,
5 151 Blue Ravine Road, Folsom, CA 95630.

6 Q. Briefly describe your responsibilities at the California Independent System Operator (CA ISO).

7 A. I am Manager of Market Analysis and Mitigation in the Department of Market Analysis. I am
8 responsible for assessing the effects of market rules and design features on CA ISO market
9 performance, and for developing market redesign proposals to enhance market efficiency. My current
10 work involves analyzing the structure of incentives and bidding strategies associated with existing and
11 alternative design options to minimize the opportunity for manipulation of CA ISO markets and abuse
12 of market power. Prior to and during the CA ISO's first year of operation, I had primary responsibility
13 for developing the CA ISO's market monitoring system.

14 Q. Please summarize your educational and professional background.

15 A. I received my Ph.D. in Environmental and Resource Economics from the University of
16 California, Davis in 1997. I have been with the CA ISO since December 1997, prior to which I
17 conducted post-doctoral research and taught environmental economics at the University of California,
18 Davis.

19 Q. Does this conclude your statement of qualifications?

20 A. Yes.

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