

## ATTACHMENT 6

### Qualifications of Anjali Sheffrin, Ph.D.

Q. Please state your name, title and business address.

A. My name is Anjali Sheffrin. I am employed by the California Independent System Operator Corporation (CAISO) as Director of Market Analysis. My business address is 151 Blue Ravine Road, Folsom, California 95630.

Q. What are your responsibilities with the CAISO?

A. As Director of Market Analysis, I am responsible for developing and managing market monitoring activities for the CAISO's wholesale electricity markets toward ensuring an open and efficient market for energy, ancillary services, and transmission services. My duties include (1) analyzing wholesale market performance and identifying abuses of market power; (2) reviewing market rules and protocols for design flaws, gaming and market power opportunities; (3) implementing corrective actions allowed under the tariff, or making regulatory filings to change market rules for ancillary services and congestion management or requesting authority for any needed mitigation; (4) developing detailed performance reports of market activity which are published on the CAISO Website; and (5) evaluating the economic impact of major transmission lines proposed in the CAISO service area.

Q. Please describe your professional background.

A. I received a Ph.D. in Economics from the University of California, Davis in 1981. I have 24 years of managerial and technical experience in the electric utility industry working on utility deregulation, market design, competitive business strategies, generation, demand-side and transmission planning, load and market research, marginal cost of service studies, and rate design. Prior to joining the CAISO, I was Manager of the Power Systems Planning and Evaluation Department at the Sacramento Municipal Utility District (SMUD). I directed a staff of 40 engineers, economists, and financial analysts in strategic planning and analysis which included assessment of generation options, initiating relicensing of SMUD's hydro project (Upper American River Project), transmission planning, load forecasting, and advanced and renewable technology development. I was the chief economist at SMUD through the closure of the Rancho Seco nuclear power plant and the evaluation of bids for replacement power. I started my professional career as Senior Economist in the Load Forecasting Department of the Potomac Electric Power Company in Washington D.C.

## ATTACHMENT 7

### Qualifications of Jeffrey C. Miller, P.E.

#### Experience

- 8/97 - **California Independent System Operator**  
151 Blue Ravine Road, Folsom, California 95630  
Position: Regional Transmission Manager
- Supervise staff of 6 responsible for overseeing the planning of new facilities for the southern half of the ISO grid.
  - Represent the ISO on a variety of regional forums including the WSCC Reliability Subcommittee, the SSG-WI Planning Work Group, and the Southwest Transmission Expansion Planning Group.
- 6/87-8/97 **Sacramento Municipal Utility District**  
6301 "S" Street, Sacramento, California 95817  
Position: Supervisor, Power System Assessments
- Supervised Staff of 7 responsible for completing a variety of operating and planning studies.
  - Chairman of the WSCC Reliability Subcommittee and the WRTA Planning Committee. WSCC PCC member. Represented WSCC on the NERC Reliability Criteria Subcommittee, WRTA Board Member.
- 6/85-6/87 **Western Area Power Administration**  
114 Parkshore Drive, Folsom, California 95630  
Position: Senior Engineer
- Supervised staff of 2 responsible for completing a variety of planning and operating studies.
  - Chairman of a work group responsible for planning the California Oregon Transmission Project.
- 7/81-6/85 **American Electric Power Service Corporation**  
1 Riverside Plaza, Columbus, Ohio 43215  
Position: Associate Engineer
- Completed seasonal operating studies, developed operating procedures, worked with the dispatchers to implement procedures.
  - Represented AEP as Chairman of NERC's ECAR Region Future System Study Group.

6/80-10/80 **Dayton Power and Light Company**  
6/79-10/79 Courthouse Plaza Southwest, Dayton, Ohio 45401  
Position: Co-op Engineer

- Maintenance engineer at JM Stuart Station (4-600MW coal-fired units in southern Ohio).

## **Education**

**College:** **Ohio State University**  
Columbus, Ohio 43215  
Degrees: B.S.E.E. – June 1980  
M.S.E.E. – September 1981  
Honors: Deans Honor List, Ohio Electric Utilities Institute Fellowship  
Courses: Completed all courses offered at OSU in the field of Electric Power Engineering

**Other Training:** Completed extensive training on various related topics including technical analysis (SVCs, DC Transmission, etc.), economic analysis, and management skills.

## ATTACHMENT 8

### Qualifications of Mingxia Zhang, Ph.D.

Q: Please state your name, title and business address.

A: My name is Mingxia Zhang. I am employed by the California Independent System Operator Corporation (CAISO) as Principal Economist/Transmission Planning Specialist. My business address is 151 Blue Ravine Road, Folsom, California 95630.

Q: What are your responsibilities at the CAISO?

A: As Principal Economist/Transmission Planning Specialist, I am responsible for developing the CAISO Transmission Evaluation Assessment Methodology (TEAM). This methodology sets the evaluation framework and criteria for the CAISO sponsored economic-driven transmission upgrade projects. I am also responsible for assisting the CAISO Grid Planning Department on reviewing and evaluating economic transmission projects submitted by PTOs.

Q: Please describe your professional background.

A: I received a Ph.D. in Agricultural and Resource Economics from the University of California, Davis in 1997. I have over 10 years of research and working experience in market competition and market power analysis, cost/benefit analysis and benefit distribution analysis, and game theoretical analysis in the electric industry and the agricultural industry. I joined the CAISO as Principal Economist/Market Monitoring Specialist in 2001. I had conducted various analyses on market performance, market competitiveness, and generators' strategic bidding in the California electricity wholesale market. Prior to joining the ISO, I was Research Economist at the University of California, Davis (UCD). During my tenure at UCD, I published over 10 journal articles in internationally leading economic journals, including *Journal of Industrial Economics*, *Southern Economic Journal*, *American Journal of Agricultural Economics*, *International Journal of Agricultural Economics*, *Agricultural and Resource Economics*, *International Journal of Agribusiness*, and *European Review of Agricultural Economics*. Most of my research and analyses focused on empirical and game theoretical modeling of imperfect competition and market power and the impact of market power on social benefit and its distribution. I started my professional career as Post-Doctorate Researcher at UCD.

## ATTACHMENT 9

### Qualifications of Jing Chen, Ph.D.

Q: Please state your name, title and business address.

A: My name is Jing Chen. I am employed by the California Independent System Operator Corporation (CAISO) as an Economist. My business address is 151 Blue Ravine Road, Folsom, California 95630.

Q: In what capacity are you employed?

A: I joined the CAISO as an Economist in 2001. In this capacity, I am a member of the CAISO staff developing the Transmission Evaluation Assessment Methodology (TEAM). This methodology sets the evaluation framework and criteria for the CAISO sponsored economic-driven transmission upgrade projects. I am also responsible for monitoring and reporting CAISO's congestion and FTR markets as well as participating in market design efforts focusing on the area of market power mitigation.

Q: Please describe your professional background.

A: I received my Ph.D. in Agricultural and Resource Economics from the University of California, Davis, in 2002. I have approximately 10-years of experience conducting economic analyses, including evaluations of transmission projects (Path 15), system reserve margins, the competitiveness of the CAISO markets, the effectiveness of market power mitigation measures. My work has been published in Journals such as IEEE Power & Energy magazine. Prior to joining the CAISO, I was Research Associate at University of California, Davis.

## ATTACHMENT 10

### Qualifications of Anna Geevarghese

Q: Please state your name, title and business address.

A: My name is Anna Geevarghese. I am employed by the California Independent System Operator Corporation (CAISO) as Senior Production Cost Analyst/Liaison to the Market Surveillance Committee. My business address is 151 Blue Ravine Road, Folsom, California 95630.

Q: What are your responsibilities at the CAISO?

A: My expertise is in production costing analysis and risk analysis related to operations. Accordingly, in my capacity with the CAISO, I assist in market monitoring activities with respect to the CAISO's wholesale electricity, ancillary services and transmission markets. In regard to the CAISO Transmission Evaluation Assessment Methodology (TEAM), I have, among other things, assisted in the application and use of the PLEXOS analytical tool.

Q: Please describe your professional background.

A: I received a M.S. in Operations Research from Stanford University, a M.S. in Statistics from Farook College, Calicut University, India, and a B.S. in Mathematics, with minors in Physics and Statistics, from the Government College, Kasaragod, Calicut University, India. Prior to joining the CAISO, I worked as an energy consultant for several firms, including The Structure Group, Henwood Energy Services, and LCG Consulting, where I performed production costing, market price forecasting, asset evaluation, strategic planning, and market power evaluation.

# ATTACHMENT 11

## Qualifications of Steven Broad

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### Summary

Steven Broad has substantial energy industry experience in a variety of areas and roles. Steven has developed tools for measuring energy and ancillary service market performance and competitiveness in California. Steven has consulted on software projects for clients such as Southern Company, Tennessee Valley Authority, British Energy, the Electricity Supply Board of Ireland and Essent Energie on projects related to the development and implementation of software systems to support short-term trading and operations decision-making. Steven has consulted to clients in a wide variety of markets including NETA (UK), EirGrid (Ireland), NEM (Australia), ERCOT and NYISO. Steven has a wide range of analytical skills pertinent to the energy industry such as experience with production cost models, risk analysis and general mathematical and statistical skills. Steven Broad has his master's degree in Mathematics from Washington University.

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### Professional experience

2003 – 2004 California ISO Folsom, CA

#### **Market Monitoring Analyst**

- Implemented production cost models for competitive market clearing price benchmarking and transmission analysis.
- Developed and implemented indices to measure the performance of California ISO ancillary services markets.
- Developed requirements for enhancement of current market monitoring systems for market redesign.

1999 – 2003 Henwood Energy Services Sacramento, CA

#### **Senior Programmer / Analyst**

- Developed and implemented short-term operational simulation software (Henwood's OPSYM / PROSYM) at numerous client sites.
- Integrated simulation tools with EMS and market data systems (e.g. forecast prices, demand, bids/offers, plant availability).
- Helped clients develop strategies to support operations and trading for markets in the process of restructuring or redefining market rules.
- Experience with developing strategies to support both operations and trading activities in the following market environments: National Energy Market of Australia, Irish Energy Market, Dutch Energy Market, New Energy Trading Agreement of the UK, ERCOT, Indonesian Energy Market, NYISO and several regional regulated utilities
- Developed spill- and top-up- pricing tools for the Irish Power Market.
- Familiar and practiced with many types of energy market analysis including implementing short- and long- term production cost models, maintenance optimization, price forecasting, power flow analysis, resource valuation, profitability analysis utilizing stochastic price and load scenarios, determination of exposure to market
- Developed and implemented a system to compute and deliver operating instructions from optimized hourly generation schedules.
- Developed and implemented a system for hourly forward pricing of bulk-power contracts based on the size of the contract and the depth at which the contract was negotiated.
- Training clients to effectively use software analysis tools for supporting generation operations and energy trading.

# ATTACHMENT 11

## Qualifications of Steven Broad

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1998 – 1999 Sage Software Roseville, CA

### **Quality Assurance Analyst**

- Validating software functionality and implementation.
- Developing business process documentation.
- Communicating technical issues between technical and non-technical people (e.g. between programmers and software end-users).
- Developing thorough, analytical test matrices against expected results to isolate software flaws or idiosyncrasies

1997 – 1998 Computerized Medical Systems St. Louis, MO

### **Software Engineer**

- Developing and validating simulation software for radiation treatment planning (used by oncologists and medical physicists when treating cancer with radiation).
  - Developing new simulation techniques for advanced treatment practices.
  - Followed rigorous ISO (International Standards Organization) 9000 best practices for ensuring and demonstrating software quality.
  - Prepared documentation for ISO and FDA audits.
  - Performed statistical analysis comparing measured results to simulation results.
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**Education** 1996 - 2000 Washington University Saint Louis, MO

### **A. M. Mathematics**

- Graduate Fellow
- Concentration in real analysis

1992 - 1996 University of Evansville Evansville, IN

### **B. S. Physics / Applied Mathematics**

- Graduated Summa Cum Laude
  - Minor in International Studies
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### **Skills**

- Advanced knowledge of Microsoft Office products.
- Advanced knowledge of Henwood Simulation Suite software.
- Advanced knowledge of SQL database development.
- Programming and software development skills.
- Experience writing documents to convey technical information.
- Experience with many kinds of simulation models both as developer and user.
- Experience with formal presentation and staff training.



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## Qualifications of Steven Broad

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### Publications and Presentations

- 1) TEAM Review of Input Assumptions, presented to Market Surveillance Committee, Folsom, CA, 17 May 2004
- 2) TEAM Assumptions Update, presented at the TEAM Stakeholder Meeting, Folsom, CA, 28 April 2004.
- 3) TEAM Generation Modeling Issues, presented to National ISO Group Planning, Folsom, CA, 11 May 2004.
- 4) Monitoring Ancillary Services Markets, presented at the EUCI Ancillary Services conference, Cambridge, MA, 17 March 2004.
- 5) Ancillary Services Bid Insufficiency, presented to Market Surveillance Committee, Folsom, CA, 02 Feb 2004.
- 6) Computing Competitive Market Clearing Prices for Ancillary Services Markets, presented at the EUCI Ancillary Services conference, Westminster, CO, 09 October 2004.
- 7) Miften, Moyed. With Mark Weismeyer, Andy Beavis, Kaz Takahashi, Steven Broad. Implementation of Enhanced Dynamic Wedge in the FOCUS RTP System. Medical Dosimetry. Vol. 25, No. 2, pp 81-86, 2000.
- 8) Broad, Steven. With Troy VanAken. Cyclic Affine Difference Sets of Order Eight Modulo Sixteen. Congressus Numerantium. Accepted and awaiting publication.
- 9) Broad, Steven. Cyclic Affine Difference Sets of Order Eight Modulo Sixteen. Southeast International Conference on Combinatorics, Graph Theory and Computing. February 1996.
- 10) Broad, Steven. The Stark Effect Perturbation Matrix. University of Evansville Senior Seminar Series. March 1995.
- 11) Broad, Steven. Natural Frequency of Fluids in Conical Test Cells in Microgravity. University of Evansville Senior Seminar Series. October 1994.

## ATTACHMENT 12

### Qualifications of Mohamed Awad

Q: Please state your name, title and business address.

A: My name is Mohamed Awad. I am employed by the California Independent System Operator Corporation (CAISO) as Lead Planning Engineer. My business address is 151 Blue Ravine Road, Folsom, California 95630.

Q: What are your responsibilities at the CAISO?

A: As Lead Planning Engineer, I am responsible for providing necessary planning expertise and input to facilitate developing the CAISO Transmission Evaluation Assessment Methodology (TEAM). I am also responsible for conducting economic analysis and studies for the Southwest Transmission Expansion Project (STEP). My duties also include reviewing and approving new generation interconnection studies, reviewing, modifying and approving Southern California Edison annual Transmission Expansion Plan and participating in developing and reviewing new planning regulations, policies and procedures.

Q: Please describe your professional background.

A: I received a Ph.D. in Electrical Engineering from the University of Toronto, Ontario, Canada in 1998. I have over 10 years of research and experience in electrical power system analyses, operation, planning and modeling. I joined the CAISO in 2000. I had conducted numerous reliability and economic analyses for various new generation and transmission expansion projects. I have had articles published in several professional journals. Prior to working for CAISO, I worked for BC Hydro, Grid Operations Division as an operation engineer.