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BEFORE THE ARIZONA CORPORATION COMMISSION

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IN THE MATTER OF THE GENERIC PROCEEDINGS CONCERNING ELECTRIC RESTRUCTURING ISSUES	DOCKET NO. E-00000A-02-0051
IN THE MATTER OF ARIZONA PUBLIC SERVICE COMPANY'S REQUEST FOR VARIANCE OF CERTAIN REQUIREMENTS OF A.A.C. R14-2-1606	DOCKET NO. E-01345A-01-0822
IN THE MATTER OF THE GENERIC PROCEEDING CONCERNING THE ARIZONA INDEPENDENT SCHEDULING ADMINISTRATOR	DOCKET NO. E-00000A-01-0630
IN THE MATTER OF TUCSON ELECTRIC POWER COMPANY'S APPLICATION FOR A VARIANCE OF CERTAIN ELECTRIC COMPETITION RULES COMPLIANCE DATES	DOCKET NO. E-01933A-02-0069
IN THE MATTER OF THE APPLICATION OF TUCSON ELECTRIC POWER COMPANY FOR APPROVAL OF ITS STRANDED COST RECOVERY	DOCKET NO. E-01933A-98-0471

Arizona Corporation Commission
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PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF ARIZONANS FOR ELECTRIC CHOICE AND COMPETITION

Arizonans for Electric Choice and Competition (AECC) hereby submits its Direct Testimony and Exhibits concerning the APS matter in the above-captioned proceedings.

RESPECTFULLY SUBMITTED this 29th day of May 2002.

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Direct Testimony of Kevin C. Higgins

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DIRECT TESTIMONY OF KEVIN C. HIGGINS

Introduction

Q. Please state your name and business address.

A. Kevin C. Higgins, 39 Market Street, Suite 200, Salt Lake City, Utah, 84101.

Q. By whom are you employed and in what capacity?

A. I am a Principal in the firm of Energy Strategies, LLC. Energy Strategies is a private consulting firm specializing in economic and policy analysis applicable to energy production, transportation, and consumption.

Q. On whose behalf are you testifying in this proceeding?

A. My testimony is being sponsored by Arizonans for Electric Choice and Competition ("AECC"). AECC is a coalition of Arizona electricity customers in favor of electric competition. AECC was an active participant in the public process that led to the development of the Commission's Electric Competition Rules and played a prominent role in negotiating comprehensive settlement agreements with Arizona Public Service Company ("APS") and Tucson Electric Power Company ("TEP") that resolved the issues of stranded cost, implementation of direct access service, and standard offer rate reductions.

Q. Were you personally involved in the negotiations that resulted in the APS and TEP settlement agreements?

A. Yes, I was closely involved in both series of negotiations on behalf of AECC.

Q. Have you previously testified before this Commission?

A. Yes. I have testified in a number of proceedings, including the generic proceeding on retail electric competition (1998)[1] and the hearings on the APS and TEP settlement agreements (1999).[2] I also filed testimony in the APS variance portion of this consolidated docket.

Q. Please describe your qualifications.

A. My academic background is in economics, and I have completed all course work and examinations toward the Ph.D. in Economics at the University of Utah, and have served on the adjunct faculties of both the University of Utah and Westminster College, teaching both undergraduate and graduate courses in economics. I joined Energy Strategies in 1995, where I assist private and public sector clients in the areas of energy-related economic and policy analysis, including evaluation of electric and gas utility rate matters. In addition to my prior testimony before the Arizona Corporation Commission, I have testified numerous times on the subjects of electric utility cost-of-service, rate design, and industry restructuring before state utility regulators in Utah, Nevada, Oregon, Washington, Colorado, Wyoming, Georgia, and New York.

Prior to joining Energy Strategies, I held policy positions in state and local government. From 1983 to 1990, I was economist, then assistant director, for the Utah Energy Office, where I testified regularly before the Utah Public Service Commission on utility policy matters. From 1991 to 1994, I was chief of staff to the chairman of the Salt Lake County Commission, one of the larger municipal

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[1] Docket No. RE-00000C-94-0165.

governments in the western U.S., where I was responsible for development and implementation of a broad spectrum of public policy.

A more detailed description of my qualifications is contained in Exhibit KCH-1, attached to this testimony.

Q. What is the purpose of your testimony in this proceeding?

A. Through my testimony, AECC reaffirms its support for the Settlement Agreements it has entered into with both APS and TEP. My testimony then addresses the "Track A" issue of market power in the context of those settlement agreements.

<u>**AECC support for settlement agreements**</u>

Q. What is AECC's position regarding the APS and TEP settlement agreements?

A. AECC continues to strongly support these agreements. The APS and TEP settlement agreements are compromises developed within the framework of the Commission's Electric Competition Rules. AECC has always viewed the benefits of these agreements from a long-term perspective: the establishment of direct access rights for all customers while permanently resolving the difficult issue of stranded cost within a framework of retail price stability. Overall, these agreements have been successful and remain the proper framework for proceeding forward. While the lack of development of direct access service has obviously been disappointing, the causes of this are largely external to the agreements, not the least of which was the extreme wholesale price surges of 2000-01. It is a

[2] Docket Nos. RE-00000C-94-0165, E-01345A-98-0473, E-01933A-97-0773, E-01345A-98-0471, and E-01933A-97-0772.

credit to the agreements that, during that period of very high wholesale prices, Arizona retail customers, almost alone in the western U.S., were afforded stable, even declining, rates. The APS agreement will continue to provide rate stability through mid-2004, and the TEP agreement will provide it through the end of 2008.

AECC also recognizes that the major issue at hand is not how well the agreements have worked in the past, but how well the agreements and the Electric Competition Rules will work in the future. In my opinion, the answer to that question turns on the issue of how potential market power is addressed in the context of the settlement agreements and the Rules. My testimony will show that market power issues *can* be properly addressed in those contexts. Accordingly, market power issues will be the primary focus of my remaining testimony.

Market power issues

Q. What conclusions do you draw concerning market power issues in Arizona?

A. On a going-forward basis, one of the chief concerns that has arisen in Arizona – appropriately I believe – is whether the state's restructuring program is capable of ensuring that retail customers will not be victims of market power abuse after the expiration of the standard offer price caps. AECC has always been mindful of the potential for market power in the transition to a competitive market, and believes that the Commission, staff, and stakeholders should be vigilant in ensuring that any market power problems be anticipated and addressed. In the context of the settlement agreements, the potential for market power is addressed in two ways: (1) Market power in load pockets is addressed initially by adhering to the "must-run generation" protocol of the Arizona Independent Scheduling Administrator (AISA), and ultimately, by developing and adhering to an appropriate load pocket treatment overseen by the Regional Transmission Organization (RTO) that covers Arizona, and (2) To the extent that market power were to become a more generalized problem in Arizona, parties could seek relief at FERC, which has jurisdiction over wholesale sales from APS and TEP generation, as well as over the APS and TEP transmission systems. While FERC's past record in addressing market power issues has been controversial and the target of significant criticism, market power is now clearly a "front-burner" issue at FERC, and is receiving, and will most surely continue to receive, a great deal more scrutiny. In this light, I recommend that in conjunction with the divestiture of generation pursuant to the Electric Competition Rules and the settlement agreements, the Commission should seek new, more rigorous market power tests to be performed with respect to the APS territory and TEP territory sub-markets. The Commission should advocate to FERC that any market-based rate authorization for affected utilities' generation affiliates should be limited to time periods in which the affected utilities and their affiliates pass this updated market power test.

Finally, I conclude that any RTO that serves Arizona must adopt market monitoring procedures that would ensure that potential market power into Arizona sub-markets is monitored and mitigated. I also recommend that the Commission actively participate in the development of these procedures.

__Market power in load pockets__

Q. By way of background, what is "market power"?

A. Market power refers to the ability of a market participant to exercise influence over price. In a perfectly competitive market, price is set by the interaction of supply and demand of numerous market participants, none of which can influence price through their individual actions. When an individual participant can, through its actions, influence the price of a product in the marketplace, some degree of market power exists. From a public policy standpoint, the concern over market power involves a supplier's ability to increase prices over competitive levels that is profitable or sustainable.

Market power can be categorized as "vertical," in which a market participant exercises control over price by virtue of its dominance in one or more stages in the production process, or "horizontal," in which a market participant exercises control over price through its dominance in the final market for the product.

Both types of market power are relevant to the electric power industry. Vertical market power can exist when a company controlling the monopoly wires business uses that control to disadvantage generators who compete with it (or its affiliate) in the generation business. Horizontal market power can exist when a single company controls sufficient market share in the generation market to allow it to set or significantly influence the market price in a given time period.

Q. Also by way of background, what is a "load pocket"?

A. A load pocket is a geographic region whose full power needs cannot be met by imports from the larger power grid during certain time periods, and which instead must rely on generation resources that are located nearby. It is this reliance on local generation which gives rise to the "load pocket market power problem," since in many cases the local generation upon which the customers in the load pocket rely will possess significant market power (during the period of such reliance).

Q. Are there generally-recognized load pockets in Arizona?

A. Yes. It is generally recognized that Phoenix, Tucson, and Yuma are load pockets, at least during certain hours of the year.

Q. How do the settlement agreements address market power in load pockets?

A. For the period prior to an RTO being put in place, both the APS and TEP settlement agreements commit the respective utilities to adhere to the FERC-approved protocols of the AISA.[3] Among these protocols is the "Must-Run Generation" Protocol, which addresses market power in load pockets.[4] The TEP settlement agreement also includes a provision that specifically requires the billing of variable must-run generation costs to be consistent with the AISA protocols.[5] Utility compliance with the AISA Must-Run Generation Protocol is consistent with the Electric Competition Rules, which directs the AISA to implement and oversee must-run generation protocols.[6]

Q. Has the AISA Must-Run Generation Protocol been approved by FERC?

[3] APS Settlement Agreement, par. 7.6; TEP Settlement Agreement, par. 9.1.
[4] AISA Protocols Manual, Section VIII, which is included in this testimony as Exhibit KCH-2.
[5] TEP Settlement Agreement, par. 4.2.
[6] R14-1609(D)(2).

A. Yes. It was approved as part of the AISA tariff effective November 2000.[7]

Q. What is the general approach to addressing load pocket market power in the AISA Must-Run Generation Protocol?

A. The AISA Must-Run Generation Protocol is designed to mitigate market power during load pocket situations while allowing market participants the flexibility to make resource decisions. During load pocket conditions, generation owners inside the load pocket are required to offer to sell to scheduling coordinators, on a cost-of-service basis, sufficient generation beyond the amount of the transmission import constraint to serve load within the load pocket. This means, for example, that even after a divestiture, the Pinnacle West generation company ("genco") is required to offer power at cost-based rates to the APS standard offer provider to serve load in the Phoenix load pocket during load pocket conditions. The Pinnacle West genco would face an identical obligation to offer power at cost-based rates to competitive scheduling coordinators.

These policies are currently in place in Arizona and have been approved by FERC with ACC support.

Q. How is market power within load pockets to be mitigated after the AISA is replaced by an RTO?

A. Mitigation of market power within load pocket should be addressed by the RTO tariff in a manner that protects retail customers while providing transmission owners and generators the necessary long-term incentives to alleviate the load pocket problem. This issue was the subject of considerable discussion in the

[7] 93 FERC ¶ 61,231.

Desert STAR process, which led to the development of a protocol that is similar to that in place at the AISA. The RTO protocol differs in that it allows the local generation owner to sell at market prices (established outside the load pocket) during load pocket conditions. It also attempts to establish a framework for creating proper incentives for generation to be constructed inside the load pocket. The Desert STAR-developed protocol was later incorporated into the WestConnect RTO filing at FERC, although it has not yet been approved, and may be subject to modification.[8]

Q. Do you believe the approaches to mitigating load pocket market power contained in the AISA Must-Run Generation Protocol and the WestConnect filing are reasonable and in the public interest?

A. Yes. I believe both variations are well thought-out, balanced approaches to a difficult problem that were developed with the input of many stakeholder groups. I think it is important for the Commission and staff to recognize that due to the work that has gone into developing these must-run generation protocols, Arizona has in place a good foundation for addressing market power in load pockets.

<u>Generalized market power</u>

Q. Please describe the issue of more "generalized" market power.

A. The problem of more generalized market power occurs if a market participant uses (or is able to use) control of the transmission system to thwart

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[8] FERC Docket Nos. RT02-1-000 and EL02-9-000, "Arizona Public Service Company, El Paso Electric Company, Public Service Company of New Mexico, Tucson Electric Power Company, WestConnect RTO,

competition in the wholesale generation and/or retail electric markets, or controls sufficient generation that it can act as a price setter in the wholesale generation (and ultimately the retail electric) market.

Vertical market power (i.e., transmission system control hindering competition in generation and/or retail markets) has been the focus of an intense national debate over the past number of years, which has centered around the implementation of FERC Orders 888, 889, and 2000. Indeed, one of the major reasons for the extensive effort being put into development of RTOs in the United States is the express purpose of mitigating vertical market power. AECC has participated in this debate and implementation through its involvement is both the AISA and Desert STAR stakeholder process, as well as its intervention at FERC in the WestConnect docket. I will not recount this extensive effort here; however, I am very confident in testifying that the issue of vertical market power is getting an extensive vetting at FERC.

Q. What about the issue of a more generalized horizontal market power?

A. In my view, in comparison to load pocket market power and vertical market power, this market power issue has had the least attention in Arizona heretofore. This is not surprising, as Arizona's vertical market power debate has been an extension of a larger national discussion, and the load pocket issue was a more obvious and immediate matter of attention in the context of developing retail access procedures.

LLC," Order No. 2000 Compliance Filing and Declaratory Order Petition ("WestConnect Filing"), Appendix D.

However, with generation divestiture on the horizon and a recent history of market power problems in the western U.S., the potential for a generalized horizontal market problem is now receiving needed attention.

Q. How would a more generalized market power problem be dealt with in the context of the settlement agreements?

A. Under the settlement agreements, the forum for addressing such a problem is FERC. In the APS Settlement Agreement, this is explicitly recognized in the final paragraph of the section addressing corporate structure, which states that: "The Parties reserve their rights under Sections 205 and 206 of the Federal Power Act with respect to the rates of any APS affiliate formed under the provisions of this Article IV."[9] This provision was included in the agreement to make clear that in agreeing to a corporate restructuring (as required by the Competition Rules), AECC was not waiving its rights to appeal to FERC for relief from potential market power problems.

Q. How confident are you that this right of appeal to FERC is adequate to protect Arizona ratepayers from market power abuse?

A. I am reasonably confident that, in today's environment, with the benefit of lessons learned from recent experiences in the west, horizontal market power problems will receive appropriate attention at FERC. Indeed this is already occurring. In particular I note that FERC has moved toward more rigorous tests of market power potential, namely the Supply Margin Assessment (SMA) test, which indicates the presence of market power if a single seller controls an amount

[9] APS Settlement Agreement, paragraph 4.6.

of generation that exceeds the market's supply margin (generation in excess of load) during peak demand.[10]

Q. Do you believe the SMA method should be applied to APS and its affiliates?

A. I believe a similar, but more comprehensive, test developed by the California ISO Department of Market Analysis should be used. This test is called the Residual Supply Index (RSI) screen, which calculates, for each hour of the year, the residual supply (total supply minus the capacity of the supplier in question) to the system demand (load plus reserve). When the RSI is significantly above 100 percent, there is sufficient supply in the market to support competitive prices even if the supplier in question withholds all of its capacity.[11] However, if the RSI is below 100 percent or (not significantly above 100 percent), then potential market power is indicated for the supplier in question, and mitigation measures are in order.

I note that APS and its affiliates already have market-based rate authorization from FERC on the basis of market power tests performed using an alternative methodology applied to the western U.S. marketplace. I believe that upon divestiture of generation pursuant to the Electric Competition Rules and the settlement agreements, the market power test should be re-performed using the RSI test applied to the APS territory sub-market. Arizona interests, including the Commission, should advocate to FERC that continuation of market-based rate authorization should be limited to time periods in which the Pinnacle West

[10] 97 FERC ¶ 61,219.

[11] "Investigation of Terms and Conditions of Public Utility Market-Based Rate Authorizations, Docket No. EL01-18-000, and Electricity Market Design and Structure, Docket No. RM01-12-000," FERC. "California

companies pass this updated market power test. The same test should also be applied to TEP with respect to the TEP territory sub-market.

Q. Why should the market power test be performed with respect to the APS-territory sub-market?

A. Because that is the relevant market for assessing whether horizontal market power is likely to be present after divestiture. I grant that Pinnacle West is a small fish in the big pond of the western grid, but the presence of transmission constraints and other operational concerns make it necessary to target this market power test to the APS territory sub-market. Indeed, it was APS itself, in articulating its defense of its proposed PPA in the variance portion of this docket, which most stridently raised the specter of potential market power in the APS territory sub-market.

Q. How has APS raised the specter of potential market power in the APS territory sub-market?

A. In the variance portion of this docket, APS made the argument that requiring it to procure from competitive bid 50 percent of the resources needed for standard offer service would likely result in unnecessarily high prices to standard offer customers. In making its case against a mandatory 50 percent bid requirement, APS asserted that new competitive generation was being constructed in locations that were not fully conducive to delivery to APS's load, and that higher prices and diminished reliability would result from bidding out generation at the required levels.

Independent System Operator Corporation Department of Market Analysis Comments Regarding [FERC]'s Proposed Market-Based Rate Standard and Mitigation Mechanism," April 24, 2002.

Q. What has this assertion got to do with the potential for market power in the APS territory sub-market?

A. *Implicit* in APS' variance argument is the proposition that absent a PPA, an "unshackled" Pinnacle West would possess market power sufficient to drive generation prices well above costs in the APS territory sub-market. Although the PPA remedy proposed by APS has met with substantial opposition, the implicit market power proposition supporting that proposal should be taken seriously. My recommendation that continued market-based rate authorization for the Pinnacle West companies should be contingent upon the passing the RSI market power test applied to the APS territory sub-market speaks to this issue.

Q. What remedies to horizontal market power are available?

A. Generally, the remedies for horizontal market power are price regulation combined with a "must-offer" requirement or divestiture of generation to other sellers.

Q. In the event that Pinnacle West was found to have market power in the APS sub-market during certain hours of the year, what mitigation measure would you recommend?

A. If the market power was load pocket related, then the existing AISA must-run generation protocol should be used. If the market power was more generally applicable to the APS territory, then some type of capped pricing – either tied to cost-of-service or an external market index – combined with a "must-offer" obligation should be required for the hours in which market power was indicated. An approach similar to the AISA must-run protocol or the local generation resource ancillary service filed by WestConnect at FERC could be modified to accomplish this.

Q. Would this approach unfairly subject Pinnacle West Companies to "lower-of-cost-or- market" pricing?

A. No. First of all, market power mitigation measures should only be employed for hours in which they are needed. Secondly, market power mitigation measures can be designed to compensate sellers using market prices established in nearby markets that are not subject to market power problems.

Q. Are there any other actions that should be taken to guard against potential market power problems?

A. Because power markets are dynamic, it is important that potential market power be subject to continuous scrutiny by an entity with region-specific expertise. FERC has recognized this need by requiring that RTOs perform a market monitoring function. In the case of Arizona, I believe this market monitoring function should include oversight of the potential market power situations in the APS territory and TEP territory sub-markets after divestiture of the affected utilities' generation pursuant to the Electric Competition Rules.

The WestConnect filing includes an appendix devoted to market monitoring, which calls for the creation of a Market Monitoring and Tariff Compliance Unit, but much of the detail of how this unit is to work has yet to be developed.[12] I recommend that the Commission become closely involved in the development of the market monitoring procedures of WestConnect (or alternative

[12] WestConnect Filing, Appendix H.

RTO with responsibility for Arizona) to ensure that potential market power into Arizona sub-markets is monitored and mitigated.

Q. Does this conclude your direct testimony?

A. Yes, it does.

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Vitae

PROFESSIONAL EXPERIENCE

Principal, Energy Strategies, L.L.C., Salt Lake City, Utah, January 2000 to present. Responsible for energy-related economic and policy analysis, regulatory intervention, and strategic negotiation on behalf of industrial, commercial, and public sector interests. Previously Senior Associate, February 1995 to December 1999.

Adjunct Instructor in Economics, Westminster College, Salt Lake City, Utah, September 1981 to May 1982; September 1987 to May 1995. Taught in the economics and M.B.A. programs. Awarded Adjunct Professor of the Year, Gore School of Business, 1990-91.

Chief of Staff to the Chairman, Salt Lake County Board of Commissioners, Salt Lake City, Utah, January 1991 to January 1995. Senior executive responsibility for all matters of county government, including formulation and execution of public policy, delivery of approximately 140 government services, budget adoption and fiscal management (over $300 million), strategic planning, coordination with elected officials, and communication with consultants and media.

Assistant Director, Utah Energy Office, Utah Department of Natural Resources, Salt Lake City, Utah, August 1985 to January 1991. Directed the agency's resource development section, which provided energy policy analysis to the Governor, implemented state energy development policy, coordinated state energy data collection and dissemination, and managed energy technology demonstration programs. Position responsibilities included policy formulation and implementation, design and administration of energy technology demonstration programs, strategic management of the agency's interventions before the Utah Public Service Commission, budget preparation, and staff development. Supervised a staff of economists, engineers, and policy analysts, and served as lead economist on selected projects.

Utility Economist, Utah Energy Office, January 1985 to August 1985. Provided policy and economic analysis pertaining to energy conservation and resource development, with an emphasis on utility issues. Testified before the state Public Service Commission as an expert witness in cases related to the above.

Acting Assistant Director, Utah Energy Office, June 1984 to January 1985. Same responsibilities as Assistant Director identified above.

Research Economist, Utah Energy Office, October 1983 to June 1984. Provided economic analysis pertaining to renewable energy resource development and utility issues. Experience includes preparation of testimony, development of strategy, and appearance as an expert witness for the Energy Office before the Utah PSC.

Operations Research Assistant, Corporate Modeling and Operations Research Department, Utah Power and Light Company, Salt Lake City, Utah, May 1983 to September 1983. Primary area of responsibility: designing and conducting energy load forecasts.

Instructor in Economics, University of Utah, Salt Lake City, Utah, January 1982 to April 1983. Taught intermediate microeconomics, principles of macroeconomics, and economics as a social science.

Teacher, Vernon-Verona-Sherrill School District, Verona, New York, September 1976 to June 1978.

EDUCATION

Ph.D. Candidate, Economics, University of Utah (coursework and exams completed, 1981).

> Fields of Specialization: Public Finance, Urban and Regional Economics, Economic Development, International Economics, History of Economic Doctrines.

Bachelor of Science, Education, State University of New York at Plattsburgh, 1976 (cum laude).

Danish International Studies Program, University of Copenhagen, 1975.

SCHOLARSHIPS AND FELLOWSHIPS

University Research Fellow, University of Utah, Salt Lake City, Utah 1982 to 1983.
Research Fellow, Institute of Human Resources Management, University of Utah, 1980 to 1982.
Teaching Fellow, Economics Department, University of Utah, 1978 to 1980.
New York State Regents Scholar, 1972 to 1976.

EXPERT TESTIMONY

"In the Matter of Savannah Electric & Power Company's 2001 Rate Case," Georgia Public Service Commission, Docket No. 14618-U. Direct testimony submitted March 15, 2002.

"Nevada Power Company's 2001 Deferred Energy Case," Public Utilities Commission of Nevada, PUCN 01-11029. Direct testimony submitted February 7, 2002. Cross examined February 21, 2002.

"2001 Puget Sound Energy Interim Rate Case," Washington Utilities and Transportation Commission, Docket Nos. UE-011570 and UE-011571. Direct testimony submitted January 30, 2002. Cross examined February 20, 2002.

"In the Matter of Georgia Power Company's 2001 Rate Case," Georgia Public Service Commission, Docket No. 1400-U. Direct testimony submitted October 12, 2001. Cross examined October 24, 2001.

"In the Matter of the Application of PacifiCorp for Approval of Its Proposed Electric Rate Schedules and Electric Service Regulations," Utah Public Service Commission, Docket No. 01-35-01. Direct testimony submitted June 15, 2001. Rebuttal testimony submitted August 31, 2001.

"In the Matter of Portland General Electric Company's Revised Tariff Schedules for Electric Service in Oregon, Advice 00-14," Public Utility Commission of Oregon, Docket No. UE-115. Direct testimony submitted February 20, 2001. Rebuttal testimony submitted May 4, 2001. Joint testimony regarding stipulation submitted July 27, 2001.

"In the Matter of the Application of APS Energy Services, Inc. for Declaratory Order or Waiver of the Electric Competition Rules," Arizona Corporation Commission, Docket No.E-01933A-00-0486. Direct testimony submitted July 24, 2000.

"In the Matter of the Application of Questar Gas Company for an Increase in Rates and Charges," Utah Public Service Commission, Docket No. 99-057-20. Direct testimony submitted April 19, 2000. Rebuttal testimony submitted May 24, 2000. Surrebuttal testimony submitted May 31, 2000. Cross examined June 6 & 8, 2000.

"In the Matter of the Application of Columbus Southern Power Company for Approval of Electric Transition Plan and Application for Receipt of Transition Revenues," Public Utility Commission of Ohio, Case No. 99-1729-EL-ETP; "In the Matter of the Application of Ohio Power Company for Approval of Electric Transition Plan and Application for Receipt of

Transition Revenues," Public Utility Commission of Ohio, Case No. 99-1730-EL-ETP. Direct testimony prepared, but not submitted pursuant to settlement agreement effected May 2, 2000.

"In the Matter of the Application of FirstEnergy Corp. on Behalf of Ohio Edison Company, The Cleveland Electric Illuminating Company, and the Toledo Edison Company for Approval of Their Transition Plans and for Authorization to Collect Transition Revenues," Public Utility Commission of Ohio, Case No. 99-1212-EL-ETP. Direct testimony prepared, but not submitted pursuant to settlement agreement effected April 11, 2000.

"2000 Pricing Process," Salt River Project Board of Directors, oral comments provided March 6, 2000 and April 10, 2000.

"Tucson Electric Power Company vs. Cyprus Sierrita Corporation," Arizona Corporation Commission, Docket No. E-000001-99-0243. Direct testimony submitted October 25, 1999. Cross examined November 4, 1999.

"Application of Hildale City and Intermountain Municipal Gas Association for an Order Granting Access for Transportation of Interstate Natural Gas over the Pipelines of Questar Gas Company for Hildale, Utah," Utah Public Service Commission, Docket No. 98-057-01. Rebuttal testimony submitted August 30, 1999.

"In the Matter of the Application by Arizona Electric Power Cooperative, Inc. for Approval of Its Filing as to Regulatory Assets and Transition Revenues," Arizona Corporation Commission, Docket No. E-01773A-98-0470. Direct testimony submitted July 30, 1999. Cross examined February 28, 2000.

"In the Matter of the Application of Tucson Electric Power Company for Approval of its Plan for Stranded Cost Recovery," Arizona Corporation Commission, Docket No. E-01933A-98-0471; "In the Matter of the Filing of Tucson Electric Power Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01933A-97-0772; "In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Docket No. RE-00000C-94-0165. Direct testimony submitted June 30, 1999. Rebuttal testimony submitted August 6, 1999. Cross examined August 11-13, 1999.

"In the Matter of the Application of Arizona Public Service Company for Approval of its Plan for Stranded Cost Recovery," Arizona Corporation Commission, Docket No. E-01345A-98-0473; "In the Matter of the Filing of Arizona Public Service Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01345A-97-0773; "In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Docket No. RE-00000C-94-0165. Direct testimony submitted June 4, 1999. Rebuttal testimony submitted July 12, 1999. Cross examined July 14, 1999.

"In the Matter of the Application of Tucson Electric Power Company for Approval of its Plan for Stranded Cost Recovery," Arizona Corporation Commission, Docket No. E-01933A-98-0471; "In the Matter of the Filing of Tucson Electric Power Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01933A-97-0772; "In the Matter of the Application of Arizona Public Service Company for Approval of its Plan for Stranded Cost Recovery," Docket No. E-01345A-98-0473; "In the Matter of the Filing of Arizona Public Service Company of Unbundled Tariffs Pursuant to A.A.C. R14-2-1601 et seq.," Docket No. E-01345A-97-0773; "In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Docket No. RE-00000C-94-0165. Direct testimony submitted November 30, 1998.

"Hearings on Pricing," Salt River Project Board of Directors, written and oral comments provided November 9, 1998.

"Hearings on Customer Choice," Salt River Project Board of Directors, written and oral comments provided June 22, 1998; June 29, 1998; July 9, 1998; August 7, 1998; and August 14, 1998.

"In the Matter of the Competition in the Provision of Electric Service Throughout the State of Arizona," Arizona Corporation Commission, Docket No. U-0000-94-165. Direct and rebuttal testimony filed January 21, 1998. Second rebuttal testimony filed February 4, 1998. Cross examined February 25, 1998.

"In the Matter of Consolidated Edison Company of New York, Inc.'s Plans for (1) Electric Rate/Restructuring Pursuant to Opinion No. 96-12; and (2) the Formation of a Holding Company Pursuant to PSL, Sections 70, 108, and 110, and Certain Related Transactions," New York Public Service Commission, Case 96-E-0897. Direct testimony filed April 9, 1997. Cross examined May 5, 1997.

"In the Matter of the Petition of Sunnyside Cogeneration Associates for Enforcement of Contract Provisions," Utah Public Service Commission, Docket No. 96-2018-01. Direct testimony submitted July 8, 1996.

"Questar Pipeline Company," Federal Energy Regulatory Commission, Docket No. RP95-407. Direct testimony prepared, but withheld subject to settlement. Settlement approved July 1, 1996.

"In the Matter of Arizona Public Service Company's Rate Reduction Agreement," Arizona Corporation Commission, Docket No. U-1345-95-491. Direct testimony prepared, but withheld consequent to issue resolution. Agreement approved April 18, 1996.

"In the Matter of the Application of PacifiCorp, dba Pacific Power & Light Company, for Approval of Revised Tariff Schedules and an Alternative Form of Regulation Plan," Wyoming Public Service Commission, Docket No. 2000-ER-95-99. Direct testimony submitted April 8, 1996.

"In the Matter of the Application of Mountain Fuel Supply Company for an Increase in Rates and Charges," Utah Public Service Commission, Case No. 95-057-02. Direct testimony submitted June 19, 1995. Rebuttal testimony submitted July 25, 1995. Surrebuttal testimony submitted August 1995.

"In the Matter of the Investigation of the Reasonableness of the Rates and Tariffs of Mountain Fuel Supply Company," Utah Public Service Commission, Case No. 89-057-15. Direct testimony submitted July 1990. Surrebuttal testimony submitted August 1990.

"In the Matter of the Review of the Rates of Utah Power and Light Company pursuant to The Order in Case No. 87-035-27," Utah Public Service Commission, Case No. 89-035-10. Rebuttal testimony submitted November 15, 1989. Cross examined December 1, 1989 (rate schedule changes for state facilities).

"In the Matter of the Application of Utah Power & Light Company and PC/UP&L Merging Corp. (to be renamed PacifiCorp) for an Order Authorizing the Merger of Utah Power & Light Company and PacifiCorp into PC/UP&L Merging Corp. and Authorizing the Issuance of Securities, Adoption of Tariffs, and Transfer of Certificates of Public Convenience and Necessity and Authorities in Connection Therewith," Utah Public Service Commission, Case No. 87-035-27; Direct testimony submitted April 11, 1988. Cross examined May 12, 1988 (economic impact of UP&L merger with PacifiCorp).

"In the Matter of the Application of Mountain Fuel Supply Company for Approval of Interruptible Industrial Transportation Rates," Utah Public Service Commission, Case No. 86-057-07. Direct testimony submitted January 15, 1988. Cross examined March 30, 1988.

"In the Matter of the Application of Utah Power and Light Company for an Order Approving a Power Purchase Agreement," Utah Public Service Commission, Case No. 87-035-18. Oral testimony delivered July 8, 1987.

"Cogeneration: Small Power Production," Federal Energy Regulatory Commission, Docket No. RM87-12-000. Statement delivered March 27, 1987, on behalf of State of Utah, in San Francisco.

"In the Matter of the Investigation of Rates for Backup, Maintenance, Supplementary, and Standby Power for Utah Power and Light Company," Utah Public Service Commission, Case No.

86-035-13. Direct testimony submitted January 5, 1987. Case settled by stipulation approved August 1987.

"In the Matter of the Application of Sunnyside Cogeneration Associates for Approval of the Cogeneration Power Purchase Agreement," Utah Public Service Commission, Case No. 86-2018-01. Rebuttal testimony submitted July 16, 1986. Cross examined July 17, 1986.

"In the Matter of the Investigation of Demand-Side Alternatives to Capacity Expansion for Electric Utilities," Utah Public Service Commission, Case No. 84-999-20. Direct testimony submitted June 17, 1985. Rebuttal testimony submitted July 29, 1985. Cross examined August 19, 1985.

"In the Matter of the Implementation of Rules Governing Cogeneration and Small Power Production in Utah," Utah Public Service Commission, Case No. 80-999-06, pp. 1293-1318. Direct testimony submitted January 13, 1984 (avoided costs), May 9, 1986 (security for levelized contracts) and November 17, 1986 (avoided costs); cross-examined February 29, 1984 (avoided costs), April 11, 1985 (standard form contracts), May 22-23, 1986 (security for levelized contracts) and December 16-17, 1986 (avoided costs).

OTHER RELATED ACTIVITY

Board of Directors, ex-officio, Desert STAR RTO, September 1999 to February 2002.

Advisory Committee, Desert STAR RTO, September 1999 to February 2002. Acting Chairman, October 2000 to February 2002.

Board of Directors, Arizona Independent Scheduling Administrator Association, October 1998 to present.

Acting Chairman, Operating Committee, Arizona Independent Scheduling Administrator Association, October 1998 to June 1999.

Member, Desert Star ISO Investigation Working Groups: Operations, Pricing, and Governance, April 1997 to present. Legal & Negotiating Committee, April 1999 to December 1999.

Participant, Independent System Operator and Spot Market Working Group, Arizona Corporation Commission, April 1997 to September 1997.

Participant, Unbundled Services and Standard Offer Working Group, Arizona Corporation Commission, April 1997 to October 1997.

Participant, Customer Selection Working Group, Arizona Corporation Commission, March 1997 to September 1997.

Member, Stranded Cost Working Group, Arizona Corporation Commission, March 1997 to September 1997.

Member, Electric System Reliability & Safety Working Group, Arizona Corporation Commission, November 1996 to present.

Consultant to business customers, "In the Matter of Competition in the Provision of Electric Services Throughout the State of Arizona," Arizona Corporation Commission, Docket No. U-0000-94-165. Preparation of comments and participation in staff workshops. Rule on retail electric competition adopted December 23, 1996.

Chairman, Salt Palace Renovation and Expansion Committee, Salt Lake County/State of Utah/Salt Lake City, multi-government entity responsible for implementation of planning, design, finance, and construction of an $85 million renovation of the Salt Palace Convention Center, Salt Lake City, Utah, May 1991 to December 1994.

State of Utah Representative, Committee on Regional Electric Power Cooperation, a joint effort of the Western Interstate Energy Board and the Western Conference of Public Service Commissioners, January 1987 to December 1990.

Member, Utah Governor's Economic Coordinating Committee, January 1987 to December 1990.

Chairman, Standard Contract Task Force, established by Utah Public Service Commission to address contractual problems relating to qualifying facility sales under PURPA, March 1986 to December 1990.

Chairman, Load Management and Energy Conservation Task Force, Utah Public Service Commission, August 1985 to December 1990.

Alternate delegate for Utah, Western Interstate Energy Board, Denver, Colorado, August 1985 to December 1990.

Articles Editor, Economic Forum, September 1980 to August 1981.

Exhibit KCH-2

AISA Must-Run Generation Protocol

VIII. Must-Run Generation Protocol

1. Purpose:

The purpose of this Protocol is to provide a framework and process governing the access to energy from Must-Run Generation to support retail transactions in a competitive market. During certain hours, load within a Load Zone may exceed the Import Limit on the Interconnected Transmission System. For such hours, each SC's ARNT will be insufficient to serve 100 percent of the SC's share of Retail Network Load in the Load Zone through imports alone. Such conditions will require that Local Generation be made available to SCs. For each SC, the difference between its share of Retail Network Load in the Load Zone and its ARNT will be specified in advance, and will be the SC's Local Generation Requirement. Third Party Suppliers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule exports from the Load Zone by the 15th day of the month ahead will decrease the Local Generation Requirement on a MW for MW basis. The specification of the SC's share of the Local Generation Requirement will occur concurrently with the steps taken in the administration of the ARNT Protocol.

Implementation of the Must-Run Generation Protocol is to occur in two phases. In Phase I, which commences with the effective date of this Protocols Manual, the Temporary Must-Run Generation Procedures set forth in Section 6 will be implemented. In Phase II, which commences when competitive direct retail access load in Arizona reaches 300MW and the Board has approved a business plan covering all aspects of Az ISA activities (including all Phase II activities), the Must-Run Generation Procedures set forth in Sections 1-5 of this Protocol will be implemented.

2. Parties

The Must-Run Generation Protocol applies to the following entities:

2.1 CAOs

2.2 SCs

2.3 TPs

2.4 Third Party Suppliers

2.5 Az ISA

3. Local Generation Management Options for Must-Run Generation Requirements

Each SC shall manage its obligation to provide its share of the Local Generation Requirement by using one or more of the following means:

3.1 Scheduling Discretionary Local Generation;

3.2 Purchasing Must-Offer Generation;

3.3 Acquiring ARNT into the Import-Limited Zone from another SC;[3] or

3.4 Implementing dispatchable direct retail load-tripping within the Load Zone (which reduces Retail Network Load within the Load Zone, and thus reduces the SC's share of Local Generation Requirement).

4. Must-Run Generation Framework

4.1 The Must Run Generation Protocol is applicable to the following Import-Limited Load Zones:

- APS Phoenix
- Tucson
- Yuma

4.2 For each Import-Limited Load Zone, the TF will determine the total Local Generation Requirement for each hour, which will be equal to the forecasted Retail Network Load within the Import-Limited Load Zone minus the Import Limit. Local Generation providers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule exports from the Load Zone by the 15th day of the month ahead will decrease the total Local Generation Requirement on a MW for MW basis.[4]

4.3 Each SC scheduling into an Import-Limited Load Zone will be assigned a share of the total Local Generation Requirement for each hour. The Az ISA will calculate each SC's share of Local Generation Requirement for each hour of the

[3] The SC providing the additional ARNT may be causing its own share of the Local Generation Requirement to increase, all things being equal.

[4] Third Party Suppliers that have Local Generation facilities with *no* Must-Offer Generation obligations that commit to run and commit to schedule outside the Load Zone may make it possible for imports into the Load Zone to be increased; however, unless such Local Generation facilities are committed to meet Local Generation Requirements in the event that the export is reduced, any increase in transmission imports could only be made if such transmission were recallable.

month and each SC's ARNT for each transmission path for each day of the month. In Phase II, the Az ISA will communicate the results of this allocation to all SCs by the 15th day of the month prior to the Operating Month. This function will be performed by the TPs until the Az ISA has the capability but, in no event, later than such time as the ARNT trading mechanism is implemented.

4.4 Each SC's share of the total Local Generation Requirement will be equal to that SC's scheduled Retail Network Load within the Import-Limited Load Zone minus the SC's ARNT into that same zone.

4.5 Each SC must meet its share of the Local Generation Requirement by one or more of the means identified in Section 3 of this Protocol.

4.6 For each Import-Limited Load Zone, the provider of Must-Run Generation service (e.g., the TP) must provide the amount of Must-Offer Generation scheduled by SCs, up to the amount of the total Local Generation Requirement. Must Offer Energy is provided at regulated prices as described in Sections 4.8 and 4.9 of this Protocol.

4.7 Each SC will be given the opportunity to purchase Must-Offer Generation up to the amount of the SC's share of the Local Generation Requirement.

4.8 Recovery of Must-Run Generation Fixed Costs occurs as part of the TP's OATT. Must-Run Generation Fixed Costs are the Fixed Costs associated with specific Must-Run Generation units. Must-Run Generation Fixed Costs will be limited to the percentage of each Must-Run Generation unit's annual usage[5] that is attributable to providing Must-Run Generation service.

4.9 Recovery of Must-Run Generation Variable Costs occurs via SC purchases of Must-Offer Generation. These purchases will take place using a regulated pricing mechanism, as set forth in the TP's OATT, that reflects the actual Variable Cost of Must-Run Generation within each Load Zone, for each hour, as it is dispatched in the most economic sequence permitted by system conditions.

5. Must-Run Generation Scheduling Sequence

5.1 Month Ahead of Operating Month

Pursuant to Section 3.2.3 of the ARNT Protocol, the monthly auctions of ARNT and share of Local Generation Requirement for each SC shall be completed by the 17th day of the month ahead of the Operating Month. Local Generation providers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule exports from the Load Zone by the 15th day of the month ahead of the Operating Month will decrease the Local Generation Requirement on a MW for MW basis. When such situations occur, ARNT into

[5] In certain circumstances, a generation facility that is needed for Must-Run Generation purposes on a first-contingency basis may have a total annual usage of zero. When such a generation facility is used, the owner of the generation facility will not be precluded from recovering appropriate Must-Run Generation Fixed Costs.

the Load Zone is increased by the amount of the reduction in the total Local Generation Requirement and is included in the auction of ARNT to SCs.[6] Concurrently, the Must-Offer Generation obligation of the Local Generation provider is reduced MW for MW. Should a Local Generation provider's export of energy be reduced during a must run situation for any reason, the Must-Offer Generation obligation will be restored in the amount of the export reduction.

Generators within Load Zones may be scheduled to serve Load outside the Load Zone without committing by the 15th day of the month ahead of the Operating Month. However, while this generation may result in increased ATC into the Load Zone, the Must-Offer Generation obligation will *not* change.

5.2 18th Day of the Month Prior To Operating Month Through Two Days Ahead of Operating Day

As ARNT is traded among SCs, each SC's share of the Local Generation Requirement will change to reflect the SC's amended ARNT. These changes shall be reported by the SCs to the Az ISA, tracked by the Az ISA and communicated by the Az ISA to TPs, as set forth in Section 5.3.

5.3 Two Days Ahead of Operating Day

By 1600 hours two days ahead of Operating Day, the Az ISA will submit the final results of the trades and exchanges of ARNT and each SC's share of Local Generation Requirements to the TP. The TP shall update its OASIS accordingly.

5.4 Day Ahead of Operating Day

Each SC will submit its Balanced Schedule pursuant to Section 6.3 of the Scheduling Protocol, which must meet or exceed its share of the Local Generation Requirement and must specify its intended purchase of Must-Offer Generation. Must-Offer Generation made available to an SC is capped at the SC's share of the Local Generation Requirement. An SC may schedule Discretionary Local Generation and/or reduce its share of Retail Network Load within the Load Zone through dispatchable direct retail Load tripping.

5.5 18th Day of the Month Prior To Operating Month Through Scheduling Hour

5.5.1 Changes in System Configurations

If contingencies or changes in system configurations result in a reduction in an SC's ARNT into an Import Limited Load Zone, the SC's share of the Local Generation Requirement shall be recalculated using the formula specified in Section 4.4.

[6] ARNT can be made available up to the lesser of: (i) total ARNT; or (ii) the Import Limit, considering exports.

5.5.2 Increased Exports by Must-Offer Generation Providers after ARNT is Allocated

If Local Generation providers that have facilities with Must-Offer Generation obligations schedule exports from the Load Zone after ARNT is allocated, such scheduling shall not decrease the Local Generation provider's Must-Offer Generation obligation even if it results in an increase in ATC into the Load Zone.

6. Temporary Must-Run Generation Procedures

During Phase I, temporary changes must be made to the Must-Run Generation Protocol to correspond to the temporary ARNT allocation procedures that will be in effect. The temporary Must-Run Generation procedures differ from the standard procedures in the following ways:

6.1 There is no trading of ARNT among SCs.

6.2 SCs' ARNT and shares of the Local Generation Requirement are specified and communicated to the SCs by the TPs ahead of the Operating Day. Local Generation providers that have facilities with Must-Offer Generation obligations that commit to run and commit to schedule outside the Load Zone by seven (7) days ahead of the Operating Day will decrease the total Local Generation Requirement. If there are changes in system conditions, the Local Generation Requirement may be modified subject to the provisions of Section 5.5 of this Protocol.

6.3 Each SC's hourly share of the Local Generation Requirement will be determined as follows: For hours for which a non-zero Local Generation Requirement is anticipated, the TP will divide each SC's previous day total Retail Network Load Schedule for the Load Zone for each hour by the total Retail Network Load in the Load Zone for that hour. The resulting percentage will be used to determine the SC's share of the Local Generation Requirement for the corresponding day and hour of the subsequent week.