**BEFORE THE ARIZONA CORPORATION COMMISSION**

WILLIAM A. MUNDELL
Chairman
JIM IRVIN
Commissioner
MARC SPITZER
Commissioner



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| IN THE MATTER OF THE GENERIC PROCEEDINGS CONCERNING ELECTRIC RESTRUCTURING. | DOCKET NO. E-00000-02-0051 |
| 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-01345-01-0822 |
| IN THE MATTER OF THE GENERIC PROCEEDINGS 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-01-0069 |
| IN THE MATTER OF THE APPLICATION OF TUCSON ELECTRIC POWER COMPANY FOR APPROVAL OF ITS STRANDED COST RECOVERY | DOCKET NO. E-01933A-98-0471 |

# PRE-FILED TESTIMONY FOR HARQUAHALA GENERATING COMPANY, LLC

Pursuant to the February 8, 2002 Procedural Order of the Administrative Law Judge in the above-captioned consolidated proceeding, Harquahala Generating Company ("HGC"), hereby submits its testimony, including a table of contents listing the issues discussed by each of HGC's witness.

RESPECTFULLY SUBMITTED this 29th day of March, 2002.

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9. Bottom line: Rate payer assumes risks whereas in competitive market there is competition on both price and terms that can shift multiple elements of price risk to bidders.

10. Under the APS PPA Pinnacle West becomes the full service provider thus making a competitor the point of contact with the customer for wholesale power.

**D. THE ELEMENTS OF AN EFFICIENT, FAIR BIDDING PROCESS.**

1. Rate certainty to the utility and its customers.

2. Transparency to all parties.

3. Methodology that encourages the highest level of participation.

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   a. Equal access to information.

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**E. TIMING OF THE RFP**

1. The sooner the RFP is issued, the better in order to take advantage of low prices.

2. 9,500 MWs of new generation is becoming available in Arizona between October 1999 and 2003.

3. 11,400 MWs of new generation available in neighboring states.

4. This is not a thin market.

**BEFORE THE ARIZONA CORPORATION COMMISSION**

# DIRECT TESTIMONY
# OF
# ALAN S. TAYLOR

ON BEHALF OF HARQUAHALA GENERATING COMPANY, LLC

GENERIC PROCEEDINGS CONCERNING ELECTRIC RESTRUCTURING ISSUES AND ASSOCIATED PROCEEDINGS

DOCKET NO. E-00000A-02-0051

DOCKET NO. E-01345A-01-0822

DOCKET NO. E-00000A-01-0630

DOCKET NO. E-01933A-02-0069

DOCKET NO. E-01933A-98-0471

MARCH 29, 2002

**Q. Please state your name and business address.**

A. My name is Alan S. Taylor, and my business address is 5511 Northfork Court, Boulder, Colorado, 80301.

**Q. By whom are you employed and what position do you hold?**

A. I am president of Sedway Consulting, Inc.

**Q. Please describe your duties and responsibilities in that position.**

A. I perform consulting engagements in which I assist utilities, regulators, and customers with the challenges that they may face in today's dynamic electricity marketplace. My area of specialization is in economic and financial analysis of power supply options – particularly helping utility buyers in conducting competitive bidding solicitations for new power supplies.

**Q. Please describe your education and professional experience.**

A. I received a Bachelor of Science Degree in Energy Engineering from the Massachusetts Institute of Technology and a Masters Degree in Business Administration from the Haas School of Business at the University of California, Berkeley, where I specialized in finance and graduated valedictorian.

I have worked in the utility planning and operations area for 17 years, predominantly as a consultant specializing in integrated resource planning, competitive bidding analysis, utility industry restructuring, market price forecasting, and asset valuation. I have testified before state commissions in proceedings involving resource solicitations, environmental surcharges, and fuel adjustment clauses.

I began my career at Baltimore Gas & Electric Company, where I performed efficiency and environmental compliance testing on the utility system's power plants. I subsequently worked for five years as a senior consultant at Energy

Management Associates (EMA, now New Energy Associates), training and assisting over two dozen utilities in their use of EMA's operational and strategic planning models, PROMOD III and PROSCREEN II. During my graduate studies, I was employed by Pacific Gas & Electric Company (PG&E), where I analyzed the utility's proposed demand-side management (DSM) incentive ratemaking mechanism, and by Lawrence Berkeley Laboratory (LBL) where I evaluated utility regulatory policies surrounding the development of brownfield generation sites.

Subsequently, I worked at PHB Hagler Bailly (and its predecessor firms) for ten years, serving as a vice president in the firm's Global Economic Business Services practice and as a senior member of the Wholesale Energy Markets practice of PA Consulting Group when that firm acquired PHB Hagler Bailly in 2000. In 2001, I founded Sedway Consulting, Inc. and have continued to specialize in economic analyses associated with electricity wholesale markets.

My resume is attached as Exhibit AST-1.

**Q. What specifically have you done in the area of competitive bidding processes?**

A. I have assisted in the development of numerous requests for proposals (RFPs) on behalf of utilities who have conducted power supply solicitations. I have helped my utility clients to manage their solicitation processes, conduct pre-bid conferences, evaluate responses to RFPs, recommend short lists of top-ranked proposals, and negotiate with power suppliers. I have performed such tasks for solicitations in California, Colorado, Florida, Georgia, Iowa, Illinois, Minnesota, North Carolina, South Dakota, and Texas. I have provided testimony before numerous state commissions and the Federal Energy Regulatory Commission (FERC) on the results of competitive bidding solicitations.

**Q. On whose behalf are you testifying?**

A. Harquahala Generating Company, LLC an Arizona independent power producer (IPP) who has a new generation facility coming on-line in 2003 and thus will be able to provide electricity to Arizona utilities.

**Q. What is the purpose of your testimony?**

A. The purpose of my testimony is to provide the Arizona Corporation Commission (ACC) with information about how competitive bidding for new power supplies has worked with other utilities and in other states around the country. Arizona Public Service (APS), in its filings with the Commission, has raised several concerns about the feasibility of such solicitations in the context of the Arizona market for wholesale power. My testimony will describe how other utilities have developed RFPs and power purchase agreements (PPAs) that address these concerns.

**Q. Are there any limitations on your testimony?**

A. Yes, I want to make it very clear that my testimony is limited to the competitive bidding process in Arizona. It concerns the implementation of a structure and schedule that currently exists in Commission rules and a multi-stakeholder Settlement. While much of my experience in other states is applicable to the Arizona situation, there are also aspects of Arizona's regulatory structure that are unique to the state; in framing my testimony, I have tried to take these Arizona-specific characteristics into account.

The information provided and recommendations made in my testimony are to support the implementation of Rule 1606(b), specifically. Rule 1606(b) of the Arizona Electricity Rules clearly state that "After January 1, 2001, power purchased by an investor owned Utility Distribution Company shall be acquired from the competitive market through prudent, arm's length transactions and with at least 50% through a competitive bid process." It is my understanding that APS agreed to these rules as part of its Settlement Agreement to implement Arizona's electric restructuring

legislation. Therefore, my testimony, and the information and statements included in it, are focused on taking my experience from other jurisdictions and providing this information to help the Commission develop an implementation program to best achieve the objectives of Rule 1606(b).

**Q. Please summarize your testimony.**

A. First, I will describe the elements and timing of the competitive bidding process. Second, I will examine the concerns that APS has raised with competitive bidding and discuss how other utilities have addressed these challenges. Lastly, I will describe what is needed to make competitive bidding work in Arizona and provide my recommendations for Arizona's process.

PROCESS AND TIMING OF COMPETITIVE BIDDING

**Q. What is competitive bidding?**

A. Broadly speaking, competitive bidding is simply a process where a utility requests proposals for power supplies to serve its retail customers. Suppliers with existing capacity or the potential to construct new resources are asked to develop offers for the sale of capacity and energy over some future time frame.

**Q. Briefly describe the kinds of bidding processes in which you have participated and your role in those processes.**

A. I have participated in a variety of solicitations – some with relatively prescriptive procedures and timetables laid out in rules, others that had greater latitude in their procedural requirements (and were consequently shorter and faster in their schedule). Often, in instances where the utility or an affiliate of the utility desired to submit proposals in the solicitation, I have been retained as an independent evaluator to perform the evaluation and ensure that a fair solicitation was conducted.

**Q. Why is competitive bidding used in power procurement?**

A. Competitive bidding is one of the best ways to ensure that customer loads are supplied with the lowest-cost and lowest-risk resources. Where there is a healthy market (or the prospects of a healthy market) available to serve such load, competitive bidding allows the benefits of competition to be realized at the wholesale level and passed on to the retail purchaser or consumer.

**Q. How widely used is competitive bidding?**

A. Competitive bidding solicitations are used by many utilities throughout the country that still have direct retail load obligations. In some regions, the existing utilities have obligations to provide "standard offer" retail services to customers that are not served by an alternate supplier and may seek to supplement their supply portfolios with new contracts acquired through competitive bidding solicitations. As far as Arizona's neighbors go, Colorado has successfully implemented competitive bidding for long-term power supplies. I have been involved with several competitive bidding solicitations on behalf of Public Service Company of Colorado in recent years and believe that there are a number of good elements of the Colorado experience that could be applied to Arizona.

**Q. Are there circumstances when competitive bidding is not used in the procurement of power?**

A. Competitive bidding is not generally used in the procurement of power for short-term transactions (e.g., for an hour, a day, or a month). These transactions are usually concluded between utility traders without resorting to formal solicitation procedures. These types of trades occur frequently in the wholesale power markets and are usually initiated over the phone or the Internet.

Also, competitive bidding is not practical when entities that are procuring the power are not creditworthy. In order to attract a significant number of bidders

and competitive bids, particularly for long-term contracts, it is necessary for bidders to be confident that they will be paid in full and in a timely manner. If the purchaser of power is not creditworthy, then those bidders that did choose to bid would incorporate an extremely high risk premium in bids that would not be beneficial to ratepayers.

**Q. Please describe the phases or elements of a typical competitive bidding process. For each phase or element, please provide an estimate of the amount of time required to complete that element, based on your experience.**

A. For a typical competitive bidding solicitation that is expected to involve a utility or utility affiliate proposal, an independent evaluator should be selected at the beginning to oversee the process, a necessary condition for fairness and equity. This task can be completed within two to three weeks.

**Q. What are the primary phases of the solicitation itself?**

A. The primary tasks of a solicitation involve the preparation of the power supply RFP, the development of proposals by the bidding community, the evaluation of those proposals, the determination of a short list, and the negotiations with the bidder(s) on the short list.

**Q. Please describe the first step – the development of the power supply RFP.**

A. This step can be done in parallel with the selection of an independent evaluator. However, ideally, the RFP should not be released until the independent evaluator has had an opportunity to study it and determine that it is a fair and reasonable RFP. The RFP should be detailed enough to provide all bidders with a clear idea of what the utility is seeking, but not so voluminous and imposing so as to discourage participation. I believe the RFP should include three sections: basic solicitation information, a set of forms to help standardize the submission of pricing and other important proposal elements, and a model contract or summary of the terms and conditions that

the utility desires to have in a purchase power agreement (PPA). The initial section of basic information should present the utility's need, describe the deadlines and procedures of the solicitation, discuss how the proposal documents should be structured (e.g., use of the forms), and describe desirable proposal attributes and generally how the proposals will be evaluated.

**Q. How long does it take to develop an RFP?**

A. A good RFP can be developed in less than a month. Usually the model PPA is the most time-intensive part of the RFP, unless the utility already has a recent agreement from which to work. Again, this process can occur in parallel with the selection of the independent evaluator, but the evaluator must have an opportunity to critique the RFP thoroughly before it is issued. In some states, a draft RFP is developed and filed with the state utility commission for public comment. This allows suggestions and improvements to be offered that can help clarify the RFP and ensure the success of the solicitation. Also, the filing of a draft RFP or the issuance of a press release that a formal RFP will be forthcoming can give members of the bidding community an opportunity to begin initial preparations for the development of proposals.

**Q. Generally, how long does it take for bidders to develop proposals?**

A. Especially if there has been some advance notice, bidders should be able to develop good proposals within a month of the RFP's official issuance. They may need even less time if they already have facilities under construction or on-line. Under such circumstances, a bidder does not need to search for sites and get organized for the potential construction of a new project.

**Q. What is entailed with the evaluation of the proposals?**

A. The evaluation process usually involves two overlapping stages. Initially, the proposals must be read and digested, with possible requests for clarifications or supplemental information being made of each bidder as quickly as possible.

The second stage, which can be undertaken even while additional bidder information is filtering in, involves the analysis of the price and nonprice attributes of each proposal. The price or economic part of this analysis is frequently performed through the use of a utility simulation or production cost model. I am familiar with quite a few of such models.

**Q. How long does the evaluation process take?**

A. That is somewhat dependent on the number and complexity of the proposals that are received; but a resource evaluation of 20-30 proposals can probably be performed in a month. If there are significant transmission analyses that need to be performed, that can add more time. With the evaluation results in hand, the utility and independent evaluator select a short list of top-ranked bidders with whom contract negotiations should begin. Sometimes, the evaluation process continues in parallel with the negotiations as new information is revealed or trade-offs need to be analyzed.

**Q. How long do you think that negotiations would take?**

A. Again, it depends on the number and complexity of shortlisted proposals. I believe that contract negotiations with a fairly focused number of shortlisted bidders can be performed in three months. This is even more likely if the facilities are already constructed or nearing completion because a host of uncertainties concerning permitting, financing, site selection, and construction planning do not have to be addressed in the PPA. Thus, from start to finish (i.e., from the commencement of the selection of an independent evaluator through contract signing), a resource solicitation can be accomplished in six months.

APS' CONCERNS SURROUNDING COMPETITIVE BIDDING

**Q. In your review of APS' application and testimony, what do you believe are APS' primary concerns surrounding competitive bidding?**

A. The company and its witnesses have put forward a number of concerns or risks that they believe would be associated with competitive bidding. Many of these concerns can be placed in the following five somewhat overlapping categories:

- Market Depth/Sufficiency of Generation and Transmission Facilities
- Price Stability
- Fuel Diversity
- Reliability
- Flexibility.

In my experience, other utilities have confronted and dealt with these risks through appropriate solicitation or contracting practices.

**Q. Please describe APS' concern about market depth.**

A. APS is concerned that competitive bidding would yield unsatisfactory results because currently there are not enough generation or transmission resources to meet the 50% requirements of Rule 1606(B).

**Q. Do you believe that this is a valid concern?**

A. No. In all of the utility resource solicitations that I have conducted, the overwhelming majority of proposals have been for new generation that was to be sited where none existed at the time of the solicitation. There were no generation facilities, no gas pipeline laterals or other fuel transportation infrastructure, no interconnection facilities, and no transmission lines. There were simply proposed plans for such undertakings. Obviously, the bid evaluation team's assessment of the feasibility of a bidder accomplishing what

he or she proposes is a major consideration in the proposal evaluation process. Likewise, the cost and feasibility of the utility being able to permit and develop any necessary associated transmission facilities is an important factor in evaluating a new proposed resource.

**Q. So the proposed resources do not need to exist currently for a competitive bidding solicitation to be successful?**

A. No. In fact, I have never heard (until now) any utility suggest that competitive bidding for long-term resources would not work unless the generation and transmission resources were already in place. In fact, based on my understanding of the amount of new generation that is currently under construction and that is coming on-line in 2002 and 2003 in Arizona, I would say that there is considerably less generation and transmission development risk facing APS in a resource solicitation process than is typically faced by other utilities. I understand that much of the new generation is located near Palo Verde – an interconnection point where new 500 kV transmission lines are being developed or planned (i.e., the Estrella, Southeast Valley, and Table Mesa lines) that will increase the transfer capabilities between Palo Verde and Phoenix. Thus, the transmission infrastructure is already in the process of being reinforced and will provide APS' customers with access to a considerable amount of new generation resources in the near future.

**Q. Given your experience, is it the case then that other utilities have solicited, negotiated, and consummated power supply contracts with IPPs even when the generation and transmission infrastructure is not in place when the contract is signed?**

A. Absolutely. Usually the contract lays out exactly what parts of the process are whose responsibility and what the consequences are of either party's failure to perform on schedule. Most long-range decisions are made in the context of uncertainty. In fact, I believe that utilities elsewhere have undertaken

competitive bidding processes with far less certainty surrounding the status of potential generation and transmission resources than is the case here.

**Q. The next issue on the list of APS' concerns is price stability. What is the nature of APS' concern?**

A. Apparently, APS is concerned that reliance on the competitive wholesale market may result in prices that are more volatile than would be experienced under their proposed PPA. The utility alludes to the wild fluctuations in the spot price of electricity in the western United States over the last several years.

**Q. Do you think that this is a valid concern?**

A. No. The overwhelming majority of competitive bidding processes that I have conducted have focused on the acquisition of long-term resources – contracts with 7-, 10-, or even 25-year terms. In such long-term contracts, the capacity prices are usually fixed over the entire duration of the PPA. There is no volatility in these prices; they are locked in by contract. APS was alluding to price volatility in the spot markets where prices are quoted for day-ahead or hour-ahead power delivery. It is precisely to avoid this spot market price volatility that my utility clients have conducted competitive bidding solicitations and entered into long-term PPAs with fixed capacity prices.

**Q. Even with fixed capacity prices, aren't energy prices such to volatility, or do IPPs offer fixed energy prices?**

A. Occasionally, they do. More often, I have seen proposals from IPPs where the contracted energy prices are tied to a fuel index. Alternatively, IPPs have offered tolling arrangements, where the buying utility will assume responsibility for procuring and delivering fuel to the IPP's generating facility. In either of these latter two instances, the energy price fluctuates with fuel prices.

**Q. But aren't those fuel prices volatile?**

A. Yes, they have been. But utilities can adopt risk management strategies to hedge the risk of high fuel prices if they so desire. Also, it is important to note that although the fuel prices may fluctuate in the energy price calculation in an IPP PPA, other components of the energy price calculation are usually fixed. For example, the facility's heat rate (i.e., its efficiency in converting fuel into electricity) is often fixed. Thus, the IPP is guaranteeing the facility's efficiency and pays for the additional fuel costs if the facility is not able to perform at the guaranteed efficiency. Often, an IPP PPA contains a variable operating and maintenance (O&M) charge, expressed in $/MWh, that establishes and anchors the payments for non-fuel-related variable costs. In the end, the fuel cost pass-through provisions of most IPP contracts that I have seen appear less risky than APS' proposed PPA. I do not see any heat rate guarantees or cost limitations in the APS PPA; the PPA is structured to pass through all of the Dedicated Unit's fuel costs to retail customers.

**Q. However, the Dedicated Units represent a portfolio of diverse resources, whereas most or all of the new generation in Arizona involves natural-gas-fired facilities. Isn't it the case that the diversity of resources behind the proposed APS PPA is a benefit?**

A. Yes. This brings me to the next area of concern that was raised by APS – namely, fuel diversity. Fuel diversity is an important attribute for a utility to pursue in developing its long-range supply portfolio. However, it is not an appropriate justification for rejecting competitive bidding, and there is no assurance that the portfolio of resources behind the proposed APS PPA strikes the right balance. The existing structure of PWCC's supply portfolio is a vestige of numerous generation planning decisions over the last four or more decades. While fuel diversity is desirable in the abstract, the specifics need to be studied – and there would be no better way to evaluate the trade-offs of costs and risks of different types and amounts of resources than to conduct a competitive bidding solicitation. Given the environmental issues facing coal-

fired generation and the uncertainties facing other energy sources such as nuclear power, it may be more desirable for APS to decrease its reliance on such facilities. Certainly relative to coal-fired resources, natural-gas-fired facilities are significantly cleaner and more efficient. Concerning the issue of price volatility, APS could secure long-term supplies of gas at fixed prices, thereby reducing or eliminating its exposure to price fluctuations.

**Q. Yes, but coal-fired generation provides the benefit of price stability.**

A. In a sense, yes. However, one reason that coal-fired generation is seen as providing a hedge against volatile natural gas prices is that utilities frequently purchase coal under long-term contracts. This is because of the capital intensive nature of coal mining, coal transportation, and coal-fired power generation. Because of this capital-intensive aspect of coal production and consumption, both buyer and seller seek security in long-term supply agreements. Coal prices in and of themselves are not necessarily as fixed as the long-term contract prices may suggest. In fact, if one looked at spot coal prices in the Rocky Mountain region (e.g., Powder River Basin) over the last 24 to 48 months, one would see that coal prices have exhibited a similar roller-coaster pattern to that of natural gas prices – doubling or tripling before settling back down to their current more moderate levels.

In the end, the subject of fuel diversity is complex and needs to be studied. The best way to do this would be through a competitive bidding solicitation.

**Q. The next concern on the list is reliability. How have your utility clients handled this issue?**

A. Utility buyers have addressed this concern through careful contracting. For example, some of my utility clients have structured their PPAs to be pay-for-performance contracts. The supplier's capacity payments are determined as a function of the facility's availability. If the facility is not 100% available (during all periods outside limited, pre-approved planned maintenances), the

IPP's capacity payments are reduced. This provides a strong incentive for the IPP to ensure that the resource is ready to generate at all times.

**Q. What other features have utilities included in their PPAs with IPPs to reinforce the reliability and economic value of a transaction?**

A. Contracts for IPP power supplies often include performance guarantees that are backed by security funding arrangements. At the outset of the transaction, the IPP must post security (e.g., a letter of credit or other financial instrument) that the utility can draw upon if the IPP fails to perform. This contracting feature is often used to ensure that an IPP is diligent in meeting construction milestones and in-service dates. Also, the buying utility can require "step-in" rights, whereby the utility can assume control of the construction or operation of a facility if milestones are not met or performance is not up to required levels. In addition, in the case of tolling contracts or PPAs that have energy prices that are tied to a fuel price index, the IPP must guarantee the facility's heat rate. There are fuel cost penalties that the IPP must bear if it is unable to maintain this heat rate.

**Q. APS' PPA offers system power not unit-contingent power. Please define these terms.**

A. A unit-contingent transaction is one where the power is generated from a specific facility. The power provider is obligated to supply power from the facility whenever the facility is available. Some ancillary services may or may not be required by the buyer.

System power is power supplied from a portfolio of generating units, usually from the system of a load-serving utility that has some surplus capacity above and beyond what its customers are likely to require over the term of the proposed contract. System power can be of varying firmness – from fully interruptible to interruptible only under limited circumstances. System power

proposals may or may not include ancillary services. In the case of the APS PPA, all ancillary services are included.

**Q. Which type of transaction is more flexible – unit-contingent power or system power?**

A. It depends on the contract and the nature of the resources. Most of the system power offers that I have seen in solicitations have been day-ahead, fully scheduled blocks of power with little or no flexibility. However, what is at the heart of the APS PPA is a full requirements obligation whereby Pinnacle West Capital Corporation (PWCC) would be obligated to supply all necessary capacity, energy, and ancillary services needed by APS' customers on a real-time basis. At the same time, contracts for unit-contingent power can be developed to provide just as much real-time response and flexibility – recognizing that serving the full requirements of a utility's customers takes a portfolio of such resources, not just one. In essence, one can acquire a portfolio of unit-contingent purchases that will be as flexible, responsive, and reliable as a full requirements system power contract like that in the proposed APS PPA.

**Q. How have your utility clients dealt with this issue?**

A. My utility clients usually pursue unit-contingent purchases and contract for the level of flexibility that they need. If they want maximum control over the proposed resource, they specify that in the RFP and build special pricing provisions into the PPA. These unit-contingent purchases are dispatched with the rest of the existing generating resources that are available to the utility. In some instances, the IPP facilities are equipped with automatic generation control (AGC) and are hooked up to the utility's dispatch center for full control and provision of real-time capacity, energy, and ancillary services.

**Q. What do you mean by ancillary services?**

A. Ancillary services are special services provided by generating or transmission elements of an electrical system that allow the system to function effectively and reliably. For example, because electricity cannot be easily or inexpensively stored, it must be produced whenever customers choose to consume it. Thus, control area operators must maintain a real-time balance between supply and demand. Thus, the sum of control area generation and imports must equal the sum of control area consumption and exports. To maintain this balance, they need to have one or more generating facilities on AGC to provide second-to-second regulation. A momentary increase in customer loads is met with an increase in generation from such units. Likewise, a momentary decrease in customer loads triggers a reduction in generation from regulating units. Regulation is an example of an ancillary service. Not all units provide regulation. First, it requires the installation of specific communication and control equipment to allow the dispatch center's computers to signal the AGC facility to increase or decrease generation. Second, some facilities are not equipped for AGC because their generating technology or dispatch mode is not compatible with providing such an ancillary service. For example, nuclear power plants are not good candidates for providing AGC. They represent baseload generation and run best when their operating conditions are kept stable.

**Q. What are other examples of ancillary services?**

A. Other examples of ancillary services are spinning reserves, non-spinning reserves, and reactive power capabilities. Spinning reserves represent a specific cushion of fast-response generation that a load-serving entity is required to maintain at all times. Usually it is a specific number of megawatts (MWs) or a percentage of customer loads. In order for a facility to be eligible for contributing to spinning reserve requirements, it usually must be generating electricity and dispatched at a level that is less than the resource's maximum capacity. Thus, if a 1,000 MW plant was dispatched at 800 MW,

the remaining 200 MW of undispatched capacity may be deemed to contribute toward spinning reserves. That 200 MW represents capacity that is "spinning" but not generating power. If another generating unit suddenly tripped off-line, this 1,000 MW facility could help fill in the gap by quickly ramping up to full capacity. Thus, by maintaining a certain amount of spinning reserves, load-serving entities increase the reliability of the system and provide necessary back-up generation for responding to system emergencies.

**Q. What are non-spinning reserves?**

A. Similar to spinning reserves, non-spinning reserves help maintain system reliability. These requirements represent a specific level of available generation that may be currently off-line but is ready to start-up on short notice. Fast-start combustion turbines are usually candidates for meeting non-spinning reserve requirements.

**Q. What are reactive power capabilities and requirements?**

A. The proper control of the generation, transmission, and distribution of alternating current (AC) electricity throughout a network requires not just the production and consumption of what is called real power (expressed in MW) but also reactive power (expressed in megavolt-amperes-reactive or MVar). In order to maintain appropriate voltages throughout the electric network, a control area/transmission system operator must make real-time reactive power adjustments. Such adjustments can be made with specialized transmission facilities (e.g., capacitor banks) or with adjustments to the excitation voltage in the generating equipment at power plants. Thus, in addition to producing real power, generating facilities can be called on to produce or consume reactive power to appropriately control the transmission network.

**Q. All of this sounds rather complicated. Can unit-contingent purchases from IPPs provide such real-time services?**

A. Absolutely. Contracts for unit-contingent power from IPPs can and do include provisions for AGC dispatchability, operating reserve contributions (toward spinning and non-spinning reserve requirements), and reactive power requirements. I have seen pricing arrangements tied to the facility's ability to provide such services, thereby creating a strong incentive for the IPP to maximize a facility's availability and flexibility.

**Q. What then do you conclude about unit-contingent contracts versus full requirements/system power contracts?**

A. I believe that unit-contingent contracts can be structured to provide just as much flexibility as full requirements contracts. I have helped utility clients negotiate full requirements contracts; but these clients tend to be municipalities or rural electric distribution cooperatives who want one power provider handling all of their supply needs. In competitive bidding solicitations for large investor-owned utilities, the preponderance of proposals that I have reviewed have been unit-contingent proposals – often with most or all of the flexibility that I described above. In fact, system sale offers in such solicitations are often scheduled products such as 5x16 (five days a week for 16 hours a day) or 7x24 (all week long) transactions with little or no ancillary services or flexibility provided.

Basically, APS itself can manage the process of procuring and dispatching power supplies/contracts from a diverse portfolio of resources that provide the utility with all of the flexibility that it needs. It does not need a single full requirements contract such as the proposed arrangement with Pinnacle West.

HOW COMPETITIVE BIDDING CAN WORK IN ARIZONA

**Q. What do you recommend that the Commission do?**

A. To achieve the goals of Rule 1606(b), I believe that the Commission should ensure that APS' customers get the best resources at the best prices by requiring APS to immediately pursue competitive bidding for more than the incremental load growth that APS has proposed. If, as APS has argued, the prices behind its proposed PPA are unbeatable, this can be proven in the marketplace. In other states, such as Colorado, there are state commission rules that apply to utilities that are contemplating the development of self-build or affiliate resources. Such utilities must solicit proposals from the market and confirm the cost-effectiveness of their plans. Similarly, and in order to comply with Rule 1606(b), I believe that APS should conduct a competitive bidding solicitation and select the best resources for its customers.

**Q. How would this be conducted?**

A. I would recommend that APS, not PWCC, develop an RFP and model PPA. The model PPA would serve as a starting point for negotiated power supply agreements with its affiliates (e.g., PWCC) or outside suppliers. A draft of the RFP and model PPA should be filed with the Commission for comment from staff and other interested parties.

**Q. Can one RFP be issued for the entire 3,000 MW or should multiple RFPs be issued?**

A. One RFP would suffice. Segmenting a solicitation into different pieces is usually only done where there is a regulatory set-aside (e.g., a certain amount of capacity that will be acquired from specific resources such as renewable energy or demand-side management). Under such circumstances, it can be beneficial to create separate solicitations.

**Q. Do you think that APS would need to issue separate RFPs for various dispatch or utilization levels (e.g., baseload, intermediate, peaking)?**

A. No, that is not necessary. In my experience with other utilities, a single RFP has been sufficient and simpler. In some cases, the utility presents the results of a generic resource optimization analysis to indicate to bidders the approximate amount of baseload, intermediate, and peaking capacity that would likely match the utility customers' needs. But the real optimization process is performed with the bids that the utility actually receives. The final, optimal blend of baseload, intermediate, and peaking capacity depends on the economic and technical characteristics of the proposed contracts and can vary from the theoretical blend that a utility might develop in a generation planning study.

**Q. What should the model PPA include?**

A. I would recommend that APS look at the model PPAs that have been offered by other utilities in competitive bidding solicitations (such as the model PPA for Xcel Energy's Public Service Company of Colorado). Such model PPAs are usually included with these other utilities' RFPs, both of which are sometimes available on the Internet. In fact, I know that Xcel Energy's Northern States Power Company (NSP) in Minnesota has a solicitation underway in which it has its RFP and a model PPA on the web. The model PPA is based largely on that which was offered in the latest solicitation in Colorado. I have reviewed this model PPA and find that it has many good features and includes pay-for-performance incentives. It aligns the interests of buyers and sellers quite well.

**Q. What should be the duration of contracts solicited by the RFP?**

A. That is a policy decision. Some utilities prefer three-year contracts, others like 10-year or 15-year PPAs. I have some utility clients who have requested each bidder to provide power supply proposals of varying duration so that the utility can explore its options and develop a diverse portfolio of contracts of

varying length. There is no right answer. As a suggestion, I would proffer a minimum of three years, a maximum of 20 years, with a preferred range between seven and 15 years.

**Q. Can the Commission cause an unwilling utility to implement bidding without taking over the process?**

A. It certainly makes things more difficult if the utility is resisting the process. However, with appropriate incentives, I believe that that the ACC can move APS to conduct a competitive bidding solicitation that would benefit the utility's ratepayers. I do not believe PWCC should be the gatekeeper in such a process (as is the case in the currently proposed APS PPA for future solicitations to meet incremental loads). APS should conduct the solicitation and adopt a separation policy that would isolate APS' bid evaluation team from PWCC and prevent PWCC from having any access to APS' bid evaluation team beyond that which is afforded to any other supplier.

**Q. Do you believe that a solicitation for 3,000 MW is too large?**

A. No, unless it was all required to be on-line by January 1, 2003. Then, such a large request for power in such a short time frame could be problematic. However, if the capacity need was phased in over a reasonable time frame to maximize competition and allow APS sufficient time to permit and build any necessary transmission infrastructure, then I do not believe that this amount of request capacity would be too large.

**Q. If the capacity needs are phased in over a few years, what do you recommend in the interim?**

A. It is important the Commission not provide incentives to delay or otherwise undermine the bidding program. For example, it would be particularly important for the Commission to not allow any direct or indirect purchases by APS from the Red Hawk generating facility – this will maintain the status quo and encourage APS to implement bidding. Also, the current proposed APS

PPA would not be appropriate as an interim agreement. If the Commission were to give the utility on a temporary or interim basis what it is seeking in the current case, I would be concerned that there would be no incentive for APS to finalize the solicitation.

**Q. Based on your experience, do you believe that APS could have 3,000 MW of power supplies under contract through a competitive bidding solicitation by January 1, 2003?**

A. Possibly. However, I believe that as long as a reasonable interim agreement is in place (that provides incentives for APS to move as expeditiously as possible), there is no need to force everything to occur by the end of this year. Certainly, all of the capacity does not need to be available on one specific date. I believe that competition (and cost savings for Arizona ratepayers) would be maximized if the Commission ordered a phased approach that would allow time for additional suppliers to participate. Most of my utility clients usually conduct solicitations that are seeking supplies that would commence over the next two to seven years. This allows sufficient time for transmission infrastructure development and affords an opportunity for long-lead-time resources to be considered. Usually minimum capacity requirements are established for each year for which the utility is seeking supplies. While the circumstances facing APS probably do not warrant a resource acquisition period that would be spread over seven years, there appears to be no compelling rationale for making such important resource decisions and selections for all deliveries starting on one specific day – January 1, 2003. Thus, I would recommend that some of the capacity needs be staggered over 2003 and 2004 (and longer if necessary) and that they be covered by the interim agreement in the meantime until whatever necessary transmission infrastructure improvements can be made to accommodate the delivery of the best supplies.

**Q. What should the Commission do to ensure that the solicitation is run fairly?**

A. Certainly the Commission should have a role in carefully reviewing all proposals and APS' evaluation results. Also, in other states, whenever affiliate transactions are contemplated, the bidding rules typically require that an independent evaluator or auditor be retained to oversee the solicitation process. Under such rules, the independent evaluator usually submits a report to the commission attesting to the fairness and appropriateness of the results and identifying any concerns with the outcome. I believe that the independent evaluator should work closely with the Commission staff and perhaps should even be retained by the Commission.

**Q. Based upon your experience conducting and overseeing bidding solicitations for utilities all over the country, what is the best way to ensure that APS' retail customers enjoy the benefits of the best available portfolio of generation resources?**

A. To summarize my testimony, I believe that the only way to truly accomplish this is to conduct a competitive bidding solicitation based upon the guidelines I have described.

**Q. Does this conclude your testimony?**

A. Yes.

# EXHIBIT AST-1: RESUME OF ALAN S. TAYLOR

## AREAS OF QUALIFICATION

Competitive bidding resource selection, integrated resource planning, risk assessment, market analysis and strategic planning

## EMPLOYMENT HISTORY

- President, Sedway Consulting, Inc., Boulder, CO, 2001-present
- Senior Member of PA Consulting, Inc., Boulder, CO, 2001
- Vice President, Global Energy Business Sector, PHB Hagler Bailly, Inc., Boulder, CO, 2000
- From Senior Associate to Principal, Utility Services Group, Hagler Bailly Consulting, Inc., Boulder, CO, 1991-1999
- Senior Consultant, Energy Management Associates, Atlanta, GA, 1983-1988
- Internships at: Pacific Gas & Electric Company, San Francisco, CA (1990)
  Lawrence Berkeley Laboratory, Berkeley, CA (1989-1991)
  MIT Resource Extraction Laboratory, Cambridge, MA (1982)
  Baltimore Gas and Electric Company, Baltimore, MD (1980)

## EDUCATION

- Walter A. Haas School of Business, University of California at Berkeley, MBA, Valedictorian, Corporate Finance, 1991
- Massachusetts Institute of Technology, BS, Energy Engineering, 1983

## PROFESSIONAL EXPERIENCE

- Developed and/or reviewed dozens of requests for proposals for utility resource solicitations.
- Conducted numerous competitive bidding project evaluations for conventional generating resources, renewable facilities, and off-system power purchases.
- Assisted in contract negotiations with shortlisted bidders in utility resource solicitations.
- Testified on utility competitive bidding solicitation results, affiliate transactions, cost recovery procedures, rate case calculations, and incentive ratemaking proposals.
- Managed the development of market price forecasts of North American and European electricity markets under deregulation.
- Performed financial modeling of electric utility bankruptcy workout plans.
- Managed the technical and economic appraisal of cogeneration facilities and brownfield generation sites.
- Trained and assisted many of the nation's largest electric and gas utilities in their use of operational and strategic planning computer models.

## SELECTED PROJECTS

2001- **Independent Evaluator for Resource Solicitation**
pres. Client: Steel Hector & Davis

Assisting Florida Power & Light in a 1,750-MW resource solicitation. Mr. Taylor is the independent evaluator in a resource solicitation that is considering purchase power options beginning in 2005 and 2006 as well a set of self-build alternatives. He is using a response surface model (RSM) to evaluate the energy-related benefits of each resource, combining that information with capacity-related costs and prices, and developing an economic ranking of all internal and market proposals.

2001- **Testimony Concerning Competitive Bidding Solicitations**
pres. Client: MidWest Independent Power Suppliers

Provided testimony in a proceeding before the Wisconsin Public Service Commission on behalf of a consortium of independent power producers. Mr. Taylor testified on the benefits and timing of a competitive bidding solicitation that Wisconsin Electric Power Company (WEPCO) should be ordered to conduct prior to the utility's development of $2.8 billion in self-build generation facilities (embodied in a WEPCO proposal called Power the Future – 2). Without the benefits of a competitive solicitation, there would be no defensible means of ensuring that the utility's customers were being offered the best, most cost-effective resources.

2001- **Regulatory Support of Commission Staff**
pres. Client: Utah Division of Public Utilities

Assisting staff for the Utah Division of Public Utilities in the division's efforts to analyze PacifiCorp's Strategic Restructuring Proposal (SRP). Mr. Taylor's efforts are primarily focused on the area of the proposed power supply agreements that will govern the sale of power from PacifiCorp's proposed new unregulated generation company to the regulated distribution company.

2001 **Negotiation of Full-Requirements Purchase Contract**
Client: Georgia cooperative utility

Assisted in negotiation of a $2 billion power purchase contract. Mr. Taylor worked with a team of legal experts and other consultants to assist the client in negotiating a 15-year full-requirements contract with a large, national power supplier. Detailed modeling simulations were performed to compare the complex transaction to the utility's own self-build alternatives. Mr. Taylor helped investigate and negotiate detailed provisions in the power supply contract concerning ancillary services and other operational parameters.

2001 **Evaluation of Resource Proposals**
Client: North Carolina municipal utility

Reviewed responses to a utility resource solicitation and assisted the client in developing a short list of the best bidders. Mr. Taylor reviewed the results of the client's economic analysis of the proposals and provided insights on various nonprice factors related to each of the top-ranked proposals. Mr. Taylor helped the client in structuring and strategizing for the negotiation process.

2000-2001 **Solicitation for New Resources**
Client: Public Service of Colorado

Assisted in the evaluation of a large number of multi-option proposals for new power supplies in the 2002-2005 time frame. Mr. Taylor managed a team of a dozen individuals who performed economic and nonprice evaluations of the proposals. Mr. Taylor developed recommendations for a short list of the best resources and managed a supplemental evaluation of second-tier bidders when the client's capacity needs subsequently increased. Ultimately, over $2 billion of contracts were negotiated for over 1,700 MW of new power supplies under terms of up to 10 years. Mr. Taylor testified before the Colorado Public Utilities Commission on the processes and results of both the primary and supplemental evaluations.

1999-2000 **Solicitation for New Resources**
Client: MidAmerican Energy

Reviewed MidAmerican's solicitation for new power supplies for the 2000-2005 resource planning period. Mr. Taylor managed a team of individuals who performed an independent parallel evaluation of MidAmerican's analysis of responses to the utility's request for proposals (RFP). Mr. Taylor reviewed MidAmerican's evaluation and negotiation process and testified to the fairness and appropriateness of MidAmerican's actions. He filed testimony before the utility regulatory commissions in Iowa, Illinois, and South Dakota.

2000 **Forecasting of Electricity Market Prices**
Client: various European clients

Helped develop electricity market prices for regional electricity markets in Austria, Belgium, France, Germany, and the Netherlands. Mr. Taylor worked with a project team in Europe to develop simulation models and databases to forecast energy and capacity prices in the deregulating European power markets.

1999 **Evaluation of New Resources**
Client: Florida Power Corporation

Helped prepare the FPC's RFP for long-term supply-side resources and assisted in the independent evaluation of responses. Mr. Taylor oversaw the review of FPC's computer simulations (in PROVIEW and PROSYM) of the proposals that were received. The project team also evaluated the proposals by using a response surface model to approximate the results that might be produced in the more detailed simulations. Mr. Taylor testified before the Florida Public Service Commission concerning his assessment of FPC's solicitation and the results of the analysis.

1998 **Evaluation of New Resources**
Client: Public Service of Colorado

Assisted the evaluation of proposals for PSCo's near-term 1999 resource additions and managed the complete third party evaluation of proposals for resources in the 2000-2007 time frame. Such resources included third-party facilities and power purchases, as well as company-sponsored interruptible tariffs. Mr. Taylor assisted with the development of the request for proposals and oversaw the evaluation of all responses. He and his team monitored subsequent negotiations with shortlisted bidders. Mr. Taylor testified before the Colorado Public Utilities Commission on the fairness of the solicitation and the results of the evaluation.

1997- **Evaluation/Negotiation of Transmission Interconnection Solicitation**
1999 Client: New Century Energies

Managed a solicitation for participation in a major transmission project interconnecting Southwestern Public Service (a Texas member of the Southwest Power Pool) and Public Service of Colorado (a member of the Western Systems Coordinating Council). As the first major inter-reliability-council transmission project in the era of open access, FERC required that SPS and PSCo solicit third-party interest in participation. This project required the development of an RFP and evaluation of responses for both equity participation and long-term transmission service for over 21 alternative high-voltage AC/DC/AC transmission projects. The evaluation focused on the costs and intangible risks of different transmission alternatives relative to the benefits and savings associated with increased economy interchange, avoided future generating capacity, and reductions in single-system spinning reserve and reliability requirements.

1996- **Evaluation/Negotiation of All-Source Solicitation**
1997 Client: Southwestern Public Service

Managed the evaluation of a broad array of responses to an all-source solicitation that was issued by Southwestern Public Service (SPS). Resources in the areas of conventional supply-side generation, renewable resources, off-system transactions, DSM, and interruptible loads were proposed. The evaluation entailed scoring the proposals for a variety of price and nonprice

attributes. Mr. Taylor assisted Southwestern in its negotiations with the bidders and performed the detailed evaluation of the best and final offers.

1996-1997 **Risk Assessment for 1,000-MW Solicitation**
Client: Seminole Electric Cooperative

Managed the review and assessment of risks associated with responses to a 1,000-MW solicitation that was issued by Seminole Electric Cooperative. The evaluation entailed reviewing selected proposals' financial feasibility, performance guarantees, fuel supply plans, O&M plans, project siting, dispatching flexibility, and bidder qualifications.

1997 **Analysis/Testimony Concerning Louisville Gas & Electric's Fuel Adjustment Clause**
Client: Kentucky Industrial Utility Customers

Performed a detailed examination of Louisville Gas & Electric's (LG&E) fuel adjustment clause and identified misallocated costs in the areas of transmission line losses and purchased power fuel costs. Mr. Taylor also critiqued LG&E's rate adjustment methodology and recommended closer scrutiny of costs associated with jurisdictional and non-jurisdictional sales. Mr. Taylor testified before the Kentucky Public Service Commission and presented the findings of his analysis.

1997 **Analysis/Testimony Concerning Kentucky Utilities' Fuel Adjustment Clause**
Client: Kentucky Industrial Utility Customers

Performed a detailed examination of Kentucky Utilities' fuel adjustment clause and recommended more appropriate allocations of costs among jurisdictional and non-jurisdictional customers. Particular emphasis was placed on inter-system sales (and the line losses associated with such sales), purchase power fuel costs, the correct determination of jurisdictional sales. Mr. Taylor testified before the Kentucky Public Service Commission and presented the findings of his analysis.

1995 **Development of All-Source Solicitation RFPs**
Client: Southwestern Public Service

Managed the development of five RFPs that solicited resources in the areas of conventional supply-side generation, renewable resources, off-system transactions, DSM, and interruptible loads. The RFPs were issued by SPS as part of an all-source solicitation to identify resources that may be competitive with two generation facilities that SPS intended to develop.

1995 **Environmental Compliance Analysis**
Client: Western utility

Performed a confidential detailed environmental analysis that involved executing hundreds of production simulations of the client utility's system (using PROSCREEN II) to analyze $SO_2$,

$NO_x$, and particulate reductions associated with different fuel-switching, capital investment, and retirement scenarios.

1994-1996 **Implementation of Continuous Emission Monitoring Regulations**
Clients: Various

Assisted over 80 utilities in ensuring their compliance with the CAAA's continuous emission monitoring (CEM) regulations (40 CFR Part 75). Using *75check*, a CEM quality assurance software system developed by Hagler Bailly, Inc., the project team analyzed the electronic data reports that utilities must file with the U.S. EPA on a quarterly basis. These reports contain detailed hourly emissions information for every CAAA-affected plant and serve as the foundation for the $SO_2$ emission allowance market.

1994 **Evaluation of Big Rivers' Clean Air Act Compliance Plan**
Client: Kentucky Industrial Utility Customers

Performed a detailed analysis of Big Rivers Electric Corporation to determine the appropriate $SO_2$ emission reduction strategy that the utility should undertake to comply with the 1990 Clean Air Act Amendments (CAAA). The utility's historical operations were studied and dozens of hourly production cost simulations of Big Rivers' utility system were performed to assess the operational and economic impacts of different CAAA compliance strategies. Risk/sensitivity analyses were undertaken to determine the affects of varying assumptions of fuel prices, capital costs, and operating and maintenance costs. Mr. Taylor testified before the Kentucky Public Service Commission, endorsing the implementation of a specific incentive ratemaking methodology that would encourage the utility to minimize its compliance costs.

1994 **Fuel Procurement Audit of Columbia Gas Company**
Client: Public Utilities Commission of Ohio

Assisted in a fuel procurement audit of Columbia Gas Company in Ohio. The utility's gas transportation programs were scrutinized to ensure that full service customers were not subsidizing transportation customers. Cost allocation procedures were studied and marginal costs of service for transportation customers were examined. In addition, the audit included an investigation of how the utility calculated and monitored unaccounted-for-gas.

1994 **Development of Competitive Bidding RFP**
Client: Empire District Electric Company

Based on knowledge gained from the review of dozens of other utility RFPs, developed a combined-cycle resource RFP for Empire District Electric Company. The project team was responsible for the RFP's entire development, including the development of scoring provisions for price and nonprice project attributes.

1993 **Selection of Developer for 25 MW Wind Facility**
Cient: Northern States Power

Evaluated ten bids that were received by NSP in a solicitation for the development of a 25 MW wind facility in Minnesota. The proposals were scored and ranked through a point-based evaluation system that was developed prior to the solicitation. The scoring involved an assessment of operational and financial feasibility, power purchase pricing terms, construction schedules, and community acceptance issues.

1993 **Competitive Bidding Design**
Client: Northern States Power

Assisted NSP in the utility's effort to design a generic competitive bidding RFP that could be issued for a variety of generation resources. Two dozen RFPs from other utilities were reviewed to determine the appropriate weights and mechanisms that should be used to score various project attributes.

1993 **Evaluation of 500 MW Supply-Side Solicitation**
Client: San Diego Gas & Electric

Assisted in the evaluation of 15 bids that were received from a 500 MW solicitation for power by SDG&E. The utility wanted to determine whether or not there were less expensive alternatives to the implementation of its plan to repower one of its own units. The 15 projects represented over 4,000 MW. The bids were evaluated using extensive production costing modeling, in which over 1,000 model runs were performed to evaluate each bid under a variety of scenarios.

1992-1993 **Integration of DSM Programs into Utility IRP Filing**
Client: Public Service Company of Colorado

Assisted utility in DSM modeling and IRP optimization using PROSCREEN II/PROVIEW. A data transfer system was designed to translate DSM program information from various utility departments. Simulations were performed to assess the cost-effectiveness of different demand- and supply-side options.

## SELECTED PUBLICATIONS AND PRESENTATIONS

"Ancillary Services, A Market Unto Itself" Financial Times Energy Conference: Navigating the New Transmission Roadmap Under FERC Order 2000, June 2000.

"Forecasting Ancillary Service Prices," Infocast Conference: How to Buy, Sell, and Price Ancillary Services in Competitive Markets, October 1999.

"Fundamentals of Electricity Deregulation," American Association of Petroleum Geologists/Electric Power Research Institute Conference, April 1999.

"The Coal/Natural Gas Balance in a Reconfigured Utility Industry," American Bar Association Conference on Electricity Law and Regulation, February 1998.

"Asset Divestitures in the Deregulating Power Markets," Hybrid U.S. Power Market Conference, February 1998.

*Modeling Renewable Energy Resources in Integrated Resource Planning*, D. Logan, C. Neil, and A. Taylor, National Renewable Energy Laboratory, May 1994.

*Regulatory Treatment of Electric Utility Clean Air Act Compliance Strategies, Costs, and Emission Allowances*, K. Rose, M. Harunuzzaman, and A. Taylor, The National Regulatory Research Institute, December 1993.

"Risk Management Under the 1990 Clean Air Act Amendments: A Study of Emissions Allowance Reserves," Electric Power Research Institute, November 1993.

"Regulatory Accounting for Acid Rain Compliance Planning," 8th Biennial Regulatory Information Conference, September 1992.

"A Seminar on the Techniques and Approaches to Integrated Resource Planning," Hawaii Public Utilities Commission, September 1992.

"A Comparison of the Uranium and Emissions Allowance Markets," A. Taylor and M. Yokell, Electric Power Research Institute, February 1992.

"State Regulation of Utility Compliance Plans and Its Impact on the Emissions Allowance Marketplace," 103rd National Association of Regulatory Utility Commissioners Annual Convention, November 1991.

"Repowering and Site Recycling in a Competitive Environment," A. Taylor and E.P. Kahn, Lawrence Berkeley Laboratory, March 1991.

**BEFORE THE ARIZONA CORPORATION COMMISSION**

# DIRECT TESTIMONY
# OF
# FRANK DE ROSA

ON BEHALF OF HARQUAHALA GENERATING COMPANY, LLC

GENERIC PROCEEDINGS CONCERNING ELECTRIC RESTRUCTURING

ISSUES AND ASSOCIATED PROCEEDINGS

DOCKET NO. E-00000A-02-0051

DOCKET NO. E-01345A-01-0822

DOCKET NO. E-00000A-01-0630

DOCKET NO. E-01933A-02-0069

DOCKET NO. E-01933A-98-0471

MARCH 29, 2002

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DOCKET NO. E-01933A-98-0471

MARCH 29, 2002

# TESTIMONY OF FRANK DEROSA

**Q. Please state your full name and corporate address.**

A. Frank DeRosa
PG&E NATIONAL ENERGY GROUP
7600 Old Georgetown Road
Bethesda, Maryland

**Q. For whom do you work and what is your title?**

A. I am Vice President for Marketing and Business Development for the Western Region for PG&E National Energy Group ("National Energy Group" or "NEG").

**Q. What is your educational background?**

A. I am a graduate of Boston University with a BA in Biology and of Harvard University with a Master's Degree in Public Policy.

**Q. Could you describe the National Energy Group and your role and experience with the company?**

A. NEG is a nation-wide independent energy company that generates electricity, operates interstate natural gas pipelines, and markets electricity and natural gas on a wholesale basis. NEG has 6,500 MW electric generating assets in operation and 5,400 MW in construction and an extensive power and gas operation in the western states, including Arizona.

I have been an officer of NEG and its precursor company for 8 years, and an employee for 13. I was one of the original employees who began the company in 1989.

During this period I have personally prepared and submitted scores of power proposals to utilities throughout the West, and have had supervisory responsibility for hundreds of proposals. I have won some and lost some, but overall have won and executed contracts with utilities in Oregon, California, Colorado, Arizona, New Mexico, and Nevada for

approximately 2,000 Mw. I am currently a Board Member of the Western Systems Coordinating Council.

**Q. Prior to working for the National Energy Group, for whom did you work?**

A. Prior to NEG, I held financial and regulatory positions with Pacific Gas & Electric Company, the U.S. Office of Management and Budget in the Executive Office of the President, and the Massachusetts Energy Office.

**Q. What is the relationship between the National Energy Group and the intervener in this proceeding, the Harquahala Generating Company, LLC ("HGC")?**

A. HGC is a wholly owned subsidiary of the National Energy Group.

**Q. What has been your personal relationship with the HGC and the development and construction of its power plant in western Maricopa County?**

A. I am responsible for marketing the output of the Harquahala Generating Plant.

**Q. Where has your employer been a successful bidder?**

A. Some of our past successes in competitive bidding processes include: the New England Electric System generation auction for standard offer load, the Colorado IRP competitive bidding process, the Texas capacity auction, and the New Hampshire Electric Cooperative load auction. In Texas, we supply Retail Electricity Providers in their recently deregulated retail electricity market. In a short time, 26 competitive suppliers have serve over 270,000 customers.[1]

**Q. What is the purpose of your testimony?**

A. My purpose is to:

1. Discuss how the competitive merchant industry perceived and responded to Rule 1606(B);

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[1] Texas Representative Steven D. Wolens March 18, 2002 letter to Texas Representative Warren Chisum, Texas House of Representatives.

2. Compare and contrast APS's proposed Purchase Power Agreement ("PPA") with typical power purchase agreements in the competitive industry; and

3. Describe the elements of an efficient, fair wholesale competitive bidding process.

**Q. Are there any limitations on your testimony?**

A. Yes, I want to make it clear that my testimony is limited to procuring competitive generation in Arizona. It concerns the implementation of a competitive structure and schedule that currently exists in Arizona Corporation Commission Electricity Rules and multi-stakeholder Settlements with APS and TEP to which both of those utilities voluntarily agreed. There are aspects of your regulatory structure, rules and existing agreements that are unique to your state and in framing my testimony concerning implementation of existing agreements I have taken these Arizona-specific characteristics into account.

**Q. How did the competitive merchant industry view Rule 1606(B) and how did it respond to the Commission's order?**

A. Rule 1606(B) orders a competitive wholesale procurement process in Arizona. The Rule and the APS Settlement call for 100% of the APS standard offer native load to be procured from the competitive market[2]. All parties to the Settlement agreed that

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[2] **Section R14-2-1606 (B) of the Arizona Electricity Rules:** After January 1, 2001, power purchased by an investor owned Utility Distribution Company shall be acquired from the competitive market through prudent, arm's length transactions and with at least 50% through a competitive bid process.

**APS Settlement:**

5. Generation Affiliate. Section 4.1 of the Agreement is replaced with and superceded by the following provisions:

   4.1. Affiliates

   (1) The Commission will approve the formation of an affiliate or affiliates of APS to acquire at book value the competitive services and assets as currently required by the Electric Competition Rules. In order to facilitate the separation of such assets efficiently and at the lowest possible cost, the Commission shall grant APS a two-year extension of time until December 31, 2002, to accomplish such separation. A similar two-year extension shall be authorized for compliance with A.A.C R14-2-1606 (B).
   (2) The affiliate or affiliates formed under this Section 4.1 shall be direct subsidiaries of Pinnacle West Capital Corporation, and not APS.

competitive bidding would result in the lowest cost of power for ratepayers. By authorizing stranded cost recovery in the Settlement for existing rate based generation, the Commission attempted to create a level playing field between utility generation and merchant generation to compete for native load.

The opportunity to compete to serve APS's load spurred an unprecedented level of investment in new generating capacity in Arizona. Since the APS Settlement was completed in October, 1999, over 9,500 MWs of new generation has been committed to Arizona - either operational today or in construction - representing over $ 6 billion in investment [See Attachment 1 for a list of plants committed since the APS Settlement was completed.] NEG, Duke Energy, PP&L Corp, Panda / TECO, Calpine, and Reliant Energy all have invested huge sums to compete to serve the consumer load authorized by Rule 1606(B). This investment is good for competition and for Arizona's overall economy. Pinnacle West, aware that it was building its Redhawk plants as merchant, not rate based, generation also invested to participate in Arizona's and neighboring states' competitive markets. Everyone knew the rules of the road when they made their investment decisions.

The Commission can gain further reassurance that the above generation will provide *long-term, reliable* power by reviewing the financial strength of the owners. Most of the owners of the new generation in Arizona have S&P credit ratings comparable to Pinnacle West Capital Corporation and Pinnacle West Energy Corporation. (See Attachment 2).

The Commission's actions produced a market response that resulted in more than enough generation to serve the needs of Arizona's electricity consumers. In fact, so much generation is being built that power prices are being discounted today. The price of power today, and the price of power in the forward curves at Palo Verde and other Western hubs, is below the cost of new generation. It is a buyer's market, one that

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(3) After the extensions granted in this Section 4.1 have expired, APS shall procure generation for Standard Offer customers from the competitive market as provided for in the Electric Competition rules. An affiliated generation company formed pursuant to this Section 4.1 may competitively bid for APS' Standard Offer load, but enjoys no automatic privilege outside of the market bid on account of its affiliation with APS.

Arizona's consumers can benefit from under Rule 1606(B). Conversely, consumers will not benefit from today's low prices if rates are set to cover the fully loaded costs of the new generation and the plants that already received stranded cost recovery . Attachment 3 shows the March 27, 2002 forward power curve at Palo Verde, as reported in "MW Daily, Long-Term Forward Assessments ($/MWH)". The table shows that prices are low today and change very little in future years.

**Q Please compare the APS request for variance proposal and associated PPA with that of a typical competitive power procurement arrangement.**

A First, the proposed PPA is cost-based. It adds up all the costs of generation and calculates a rate that recovers those costs. It is the same as the cost-of-service ratemaking that Rule 1606(B) replaced. A competitive process, on the other hand, pits multiple bidders against one another to achieve the lowest *market* price. Whether a particular party made a good or bad investment decision does not determine what consumers pay because no single party sets the price.

Second, the proposed PPA does not guarantee a price to consumers. There are a significant number of price adjustments included in the terms. Some of the most significant adjustments are:[3]

Facilities Charge. Every three years the cost of operating and maintaining the generating facilities is recalculated to account for variances against an original budget. If capital and operating costs are higher than anticipated, those actual costs get passed through.

Fuel Cost. Fuel costs are adjusted annually for actual cost. Higher than forecasted fuel costs are passed through.

Purchased Power. If purchased power costs exceed the forecast, they are passed through to the ratepayers.

[3] October 18, 2001, APS proposed Purchase Power Agreement Service Schedule Attachment #1,and #2.

Nuclear Power. Any costs above forecast associated with Palo Verde Nuclear Generating Station for capital improvements, fuel, spent fuel processing, waste disposal, decommissioning, etc., are passed through.

Emissions Control. The proposal includes an adjustment for the actual cost of emissions –allowances.

Supplemental Energy Products. If full loads requirements exceed the contracted amount then any and all costs and expenses incurred with the acquisition of the products are passed on to ratepayers.[4]

Of course, if costs go down, rates are reduced. But the fact remains that the ratepayer is being asked to take on a significant amount of risk while the supplier under the PPA is protected if actual costs differ from the original budget.

In a competitive process, just as bidders compete on price, they compete on terms. Other than the nuclear power category, the NEG has submitted bids and entered contracts in which it guaranteed that prices would not change if the above costs were different than forecast. By taking on this risk, the bidder protects the consumer from unexpected cost increases and any inefficiency or imprudent management the bidder may suffer. In some cases, it may be in the consumer's interest to have a pass-through of a volatile cost item rather than pay a premium to guarantee it. But the competitive market lets bidders incur risk to make their offer more attractive – in this case so the buyer isn't automatically responsible for the supplier's cost overruns. If APS issues an RFP, I believe there will be bidders who will fix the price of many of the above cost items with no adjustor if actual costs differ.

Third, under the proposed PPA, Pinnacle West, as the full requirements provider, becomes the sole agent and point of contact for all of APS's power needs, even for the small amount that is APS proposes to bid out. Thus, my company would have to provide sensitive information and bid confidential pricing and terms to Pinnacle West even though Pinnacle West is a competitor. Furthermore, we and other firms compete with

[4] October 18, 2001, APS proposed Purchase Power Agreement, page SS4.

Pinnacle West in the merchant market at Palo Verde and throughout the West for non-APS loads. Under the proposed variance, Pinnacle West will have detailed knowledge of its competitors' pricing, strategy, products, and weaknesses that it can use in competition for other business. This will discourage bidders that feel the deck is stacked and that the risk of revealing confidential information is too high compared to the chance that they will be selected as a winning bidder. Given this circumstance, the obvious solution is for APS to conduct its own procurement.

**Q What are the elements of an efficient, fair wholesale bidding process?**

A bidding process as envisioned by Rule 1606(B) should provide (1) rate certainty to the utility and its customers, (2) transparency to all parties, (3) a methodology that invites the highest degree of participation, and (4) a level paying field for bidders.

Rate Certainty to the Utility and its Customers

The procurement rules should be clear enough up front so that the utility knows it is complying with them and will not be subject to 'Monday morning quarterbacking' and disallowances. The Commission should adopt a set of standards for the utility to meet so that it does not have to review and decide on each contract after the fact. By approving a portfolio policy (e.g., allowing for a mix of contracts that vary in duration, technology type, fuel type, etc), an auction methodology, and a set of compliance rules, the Commission can assure itself that the utility has acted prudently at the specific point in time under the then-current market conditions.

This approach has a number of very practical benefits. First, it saves time. Once the process is approved, the utility can conduct the auction without the risk of having to start over if the Commission disallows contracts. Second, it will attract lower priced bids. This is because a bid that is conditioned on Commission approval, which may occur weeks or months later, has to have provisions to protect the supplier against movement of the market or cost inputs. Those provisions carry a risk premium, resulting in a higher priced bid. Third, a pre-approved process gives the utility more ability to respond to market conditions. It can act when prices are low (such as now), while it would risk

missing a window of opportunity if it had to go back to the market if the Commission disapproved a contract. Lastly, greater certainty of rate recovery will enhance the utility's credit rating and result in both lower borrowing costs and lower bid prices. The importance of a company's credit rating has become quite apparent in recent months. Uncertainty over whether the utility will be able to recover its procurement costs will increase the credit risk to the supplier, resulting in a credit premium to the bid.

Transparency to All Parties

Rule 1606(b) states, "After January 1, 2001, power purchased by an investor owned Utility Distribution Company shall be acquired from the competitive market through prudent, arm's length transactions and with at least 50% through a competitive bid process." In order to achieve the objectives of this process, and to ensure that purchases have been made through "prudent, arm's length transitions," transparency is essential. A transparent process That ensures "prudent, arm's length transactions" could be designed as one in which the potential bidders know what the process will be before they bid, a draft RFP is made available for comment before it is issued, and oversight of the RFP evaluation and selection is provided by a disinterested third party answerable to the Commission. It is extremely important that the criteria for selecting winning bids be stated in advance in the RFP. For example, it is necessary for bidders to understand the weights that will be given for price and non-price selection factors.

The RFP and these other criteria should be pre-approved by the Commission, after receiving comment by interested parties.

Methodology that Invites the Highest Degree of Participation

It is clear that Rule 1606(b) is written to maximize the role of the competitive wholesale market in serving Arizona's standard offer load. That said, the wholesale market offers many products and services, with some entities specializing in one type or another. For example, wholesale power products fulfill very specific niches: base load, intermediate,

peaking, and ancillary services[5]. Various types of plants provide each of these products most cost-effectively. In order to achieve the objective of Rule 1606(b) in terms of maximizing the role of the competitive market, the RFP should allow suppliers to bid on discrete products[6] as well as bundled supplies. In that way, bidders can offer those products they are most efficient in producing. For example, our Harquahala generating facility can generate extremely cost-effective base load power 7 days per week, 24 hours per day. On the other end of the spectrum, our new 111 MW peaking facility in suburban Denver provides extremely responsive peaking and load-following capability, but would not be cost-effective to run 7x24. Each bidder can tailor their bids to their strengths.

APS would then evaluate all the bids and assemble a combination of bids that produces the lowest cost supply portfolio. Bidders would be free to bid on selected wholesale products or an entire slice of the full-requirements load.

This methodology encourages many bidders rather than limiting the auction to those few who have the capability to offer full requirements. The consumer is better off because the resulting portfolio will be the combination of the strongest bids for each product.

Level Playing Field

Again, in order to achieve the objective of Rule 1606(b), which is to maximize the use of the competitive wholesale market in serving standard offer load, the Commission should ensure that there is maximum participation in the bid process. One of the main ways to encourage participation is to send a signal that all bidders will be treated equally. One way of doing this is to make sure that all potential bidders have the same access to the APS auction methodology and load information, and are able to procure ancillary services and any specialized products such as localized voltage support at the same price APS would charge itself.

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[5] Ancillary services are: a) Scheduling, System Control and Dispatch Service; b) Reactive Supply and Voltage Control from Generation Sources Service; c) Regulation and Frequency Response Service; d) Energy Imbalance Service; e) Operating Reserve - Spinning Reserve Service; f) Operating Reserve - Supplemental Reserve Service

[6] Typical standard wholesale products include flat 7 by 24, flat 6 by 16, firm capacity, and unit commitment.

Equal access to information would preclude Pinnacle West from participating in the formulation of the RFP or acting as the RFP administrator if Pinnacle West intends to submit a bid now or in the future. Ancillary services should be made available by APS to all participants on the same price and terms. Any necessary generation needed for local voltage support or other localized conditions should be maintained by APS or its affiliate outside of the procurement process. Such localized generation would then be integrated, along with the winning bids, into the overall supply portfolio. In all cases, the Commission should ensure that Pinnacle West (1) does not have special access or advantage in the RFP formulation or bidding, (2) does not have access to proprietary competitor information, (3) does not have a monopoly on an essential product or service and (4) cannot utilize a localized product or ancillary service for a different cost than other bidders pay.

**Q. When should the Commission direct APS to conduct its RFP?**

A. The Commission ordered competitive bidding to begin in 2003. Given the current favorable market conditions, the sooner the RFP is conducted, the more likely it is that consumers will benefit from the available discounted prices. Other utilities are doing just that. In the past few months, Arizona Electric Cooperative, San Carlos Indian Irrigation Project, Valley Electric Association, and Nevada Power Corporation, among others, have gone out for long-term power purchases.

**Q. You paint a rosy picture of the opportunities available if Rule 1606(B) were to be implemented as it is currently on the books, but APS and TEP, in their request to vary from that rule and in their testimony in support of that request, describe a very different picture. They suggest that there are practical barriers to implementation of Rule 1606(B) that they cannot overcome. It is asserted that there is insufficient available generation capacity, specifically if the capacity of non-affiliated generation is relied upon, to provide the 3000 MW of power to be supplied through the competitive bidding process in 2003. Could you comment?**

A. As shown in Attachment 1, over 9,500 MWs of power will have become operational between October 1999 and 2003 in Arizona alone. This does not count the11,400 MWs

of new generation in operation or under construction in neighboring states that can easily be delivered into Arizona through the high voltage transmission system. The NEG and other substantial independent power suppliers are capable of making large deliveries of firm wholesale power to Arizona utilities on or before January 1, 2003. Every day significant volumes of firm power are traded by the NEG and other companies at Palo Verde. There is no shortage of power that can be reliably delivered into Arizona today by financially strong, credit-worthy suppliers in Arizona today.

**Q. It has been asserted that there are too few market participants to make a competitive bidding process truly competitive and the thinner the competitive market the higher the anticipated cost of supplying power to the retail market. What is your reaction to this assertion?**

A. This objection is often raised by opponents of competitive bidding. Indeed, in every state in which there has been successful competitive bidding, those that tried to prevent it have made this argument. Mr. Alan Taylor in his testimony will address this issue in greater detail. I would only note that in the most recent competitive bidding process in New Jersey to serve 17,000 Mw of load, there were twenty qualified bidders seeking to serve the load at favorable prices. The recent experience in Colorado also resulted in over 50 bidders offering many times the quantity of power needed - over 9,000 MWs. Ultimately Colorado utilities signed contracts for approximately 2,000 MW and not a single contract was signed with an affiliate of the incumbent utility.

**Q. Any concluding comments?**

A. As I stated at the outset of this testimony, Arizona, by implementing the Rules and Settlements already in place, has a tremendous opportunity to ensure low electric rates for the state's consumers well into the future. This state's Corporation Commission has made the right decisions and its timing could not be more propitious. Thus, we would urge the Commission to stay the course it has set for itself over the last five years. A buyer's market exists today in the West; the timing could not be better for a long-term

auction. The time has come for APS to develop a proper RFP in an open process under the guidance of the Commission.

This concludes my testimony.

## Attachment 1

**Platts NEWGen, March 2002**

Plants with estimated on-line dates between 1/2000 and 12/2004, capacity > 15 MW

| State | Status | Online | Plant | Capacity (MW) |
|---|---|---|---|---|
| AZ | Operating | 5/2001 | South Point Power Plant 1 | 545 |
| | | 6/2001 | Desert Basin 1 | 560 |
| | | | West Phoenix (AZPS) 1 | 120 |
| | | 6/2001 | De Moss Petrie 1 | 75 |
| | | | North Loop 1 | 21 |
| | | 9/2001 | Griffith Energy Project 1 | 620 |
| | Operating Total | | | 1,941 |
| | Under Construction | 6/2002 | Arlington Valley 1 | 550 |
| | | | Kyrene Generating Station 1 | 260 |
| | | | Redhawk 1 | 1,160 |
| | | 9/2002 | PPL Sundance 1 | 450 |
| | | 3/2003 | Gila River Power Station 1 | 575 |
| | | 5/2003 | Gila River Power Station 2 | 575 |
| | | 6/2003 | Harquahala Valley 1 | 1,092[7] |
| | | | Sempra Mesquite 1 | 650 |
| | | | West Phoenix 1 | 530 |
| | | 7/2003 | Gila River Power Station 3 | 575 |
| | | 9/2003 | Gila River Power Station 4 | 575 |
| | | 1/2004 | Sempra Mesquite 2 | 650 |
| | Under Constr Total | | | 7,633 |
| AZ Total | Operating and Under Construction | | | **9,583** |

[7] Nominal capacity of the plant assuming operation at 68°F and 30% relative humidity.

**Attachment 2**

Current S&P Credit Ratings – Unsecured Securities

| | |
|---|---|
| Pinnacle West | BB |
| Pinnacle West Energy Corp. | BBB |
| | |
| PG&E National Energy Group Inc | BBB |
| Duke Energy Corp. | A+ |
| Duke Energy Trading and Marketing, L.L.C. | A- |
| Calpine Corp. | B+ |
| PPL Corp. | BBB+ |
| Reliant Energy Resources Corp. | BBB+ |
| Reliant Energy Inc. | BBB |
| Sempra Energy | A |
| TECO Energy, Inc. | A- |
| Panda Funding Corp. | BB- |

**Attachment 3**

March 27, 2002 forward power curve at Palo Verde, as reported in "MW Daily, Long-Term Forward Assessments ($/MWH)".

WEST FORWARD ASSESSMENTS

| | Apr | May | Q2 | Q3 | Q4 | Q1-03 | Cal-2003 | Cal-2004 |
|---|---|---|---|---|---|---|---|---|
| Mid-C | 32.15 | 25.75 | 27.75 | 36.75 | 35.85 | 35.25 | 34.50 | 35.00 |
| Palo Verde | 36.25 | 34.65 | 35.00 | 46.00 | 33.75 | 34.00 | 37.75 | 38.00 |
| NP15 | 36.75 | 33.50 | 34.25 | 45.50 | 36.75 | 36.25 | 38.75 | 39.25 |
| SP15 | 37.00 | 35.00 | 36.00 | 47.00 | 36.00 | 36.00 | 39.50 | 40.00 |