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AZ CORP COMMISSION
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BEFORE THE ARIZONA CORPORATION COMMISSION

WILLIAM A. MUNDELL
Chairman
JIM IRVIN
Commissioner
MARC SPITZER
Commissioner

IN THE MATTER OF THE GENERIC PROCEEDINGS CONCERNING ELECTRIC RESTRUCTURING	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. 4-14-2-1606	DOCKET NO. E-01345A-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 COMPANY'S APPLICATION FOR A VARIANCE OF CERTAIN ELECTRIC POWER COMPETITION RULES COMPLIANCE DATES	DOCKET NO. E-01933A-98-0471
ISSUES 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 **NOTICE OF FILING DIRECT TESTIMONY**

Intervenor Panda Gila River, L.P. hereby provides notice of filing the Direct Testimony of Craig R. Roach, Ph.D. concerning the "Track A" issues in the above-captioned dockets.

Arizona Corporation Commission
DOCKETED

MAY 29 2002

DOCKETED BY

FENNEMORE CRAIG
A PROFESSIONAL CORPORATION
PHOENIX

RESPECTFULLY SUBMITTED this 29th day of May, 2002.

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See attached for filing and service list.

1286016.1/73262.005

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Commissioner
MARC SPITZER
Commissioner

IN THE MATTER OF THE GENERIC PROCEEDINGS CONCERNING ELECTRIC RESTRUCTURING	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. 4-14-2-1606	DOCKET NO. E-01345A-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 COMPANY'S APPLICATION FOR A VARIANCE OF CERTAIN ELECTRIC POWER COMPETITION RULES COMPLIANCE DATES	DOCKET NO. E-01933A-98-0471
ISSUES 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

DIRECT TESTIMONY OF
CRAIG R. ROACH, Ph.D.
ON "TRACK A" ISSUES

ON BEHALF OF
PANDA GILA RIVER, L.P.

May 29, 2002

TABLE OF CONTENTS

		Page
I.	QUALIFICATIONS	1
II.	PURPOSE OF TESTIMONY	2
III.	SUMMARY OF TESTIMONY	3
IV.	APS HAS MARKET POWER IN ITS SERVICE TERRITORY IN BOTH GENERATION AND TRANSMISSION	4
V.	ADDITIONAL MITIGATION IS REQUIRED TO ADDRESS APS' MARKET POWER IN THE TRANSMISSION CONSTRAINED AREA OF PHOENIX	13
VI.	RECOMMENDATIONS TO THE COMMISSION	15

I. QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, POSITION, AND BUSINESS ADDRESS.

A. My name is Craig R. Roach. I am a Partner with Boston Pacific Company, Inc. My business address is 1100 New York Avenue, NW, Suite 490 East, Washington, DC 20005.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND.

A. I earned my Ph.D. in Economics from the University of Wisconsin and my Bachelor of Science Degree in Economics, cum laude, from John Carroll University.

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.

A. I have twenty-seven years of experience working on investments in, policies for, and litigation concerning the electricity and natural gas businesses. From 1975 to 1979, I was an economist with the U.S. Congressional Budget Office. From 1979 to 1982, I was a Project Manager with ICF Incorporated, an energy and environmental consulting firm.

From 1983 to the present, I have worked with Boston Pacific, first in San Francisco and since 1987 in Washington, D.C. Boston Pacific is an energy consulting and investment services firm. My clients include competitive power suppliers, electric utilities, electric and gas marketers, gas pipeline companies, trade associations, government agencies, and energy consumers.

Q. DO YOU HAVE EXPERIENCE AS AN EXPERT WITNESS?

A. Yes. I have extensive experience as an expert witness on electricity and natural gas issues. A complete list of my testimony is contained in Exhibit No. CRR-1. Also shown therein is a list of my speeches and articles on issues in the electricity and natural gas businesses, and on other energy businesses.

I have submitted testimony, affidavits, or comments to the Federal Energy Regulatory Commission ("FERC") in sixteen proceedings, to public utility commissions in fifteen states (some on multiple occasions), in arbitrations, in State Court, in Federal Court, to a City Council, before two Canadian Provincial Boards, and before a

Congressional Subcommittee.

Q. DO YOU HAVE EXPERIENCE TESTIFYING ON THE ISSUE OF MARKET POWER?

A. Yes. I have served as an expert witness on market power in the electricity and natural gas businesses in a great number of proceedings. Since January 2001 alone, I have been invited to participate in three FERC Technical Conferences on market power monitoring and mitigation.

Q. DO YOU HAVE RELEVANT EXPERIENCE BEYOND THAT REFLECTED IN YOUR EXPERT TESTIMONY?

A. Yes. Beyond expert testimony, I have extensive experience providing financial advisory services for power project development and asset acquisition throughout the U.S. and around the world.

Q. HAVE YOU TESTIFIED BEFORE THE ARIZONA CORPORATION COMMISSION IN RELATED PROCEEDINGS?

A. My Direct Testimony was filed with the Arizona Corporation Commission (Commission) in connection with the Arizona Public Service (APS) request for (a) a variance from the Electric Competition Rules and (b) approval of a power purchase agreement (PPA) with an Affiliate (Affiliate PPA).

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying again on behalf of Panda Gila River, L.P. (Panda).

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?

A. The purpose of my Testimony is to address the issues set by the Commission for what is termed "Track A" of this proceeding. The Commission stated:

> The hearing on the issues identified in Staff's April 23, 2002 Response to Arizona Public Service Company's Motion for Determination of Threshold Issue – the transfer of assets and associated market power issues, as well as the issues of the Code of Conduct, the Affiliated Interest Rules, and the jurisdictional issues raised by Chairman Mundell,

> (collectively, the "Track A" issues) will be conducted beginning on June 17, 2002. The Competitive Solicitation ("Track B") will proceed concurrently with Track A, with a target completion date of October 21, 2002.[1]

Q. HOW DID STAFF PHRASE THE MARKET POWER CONCERN REFERENCED BY THE COMMISSION?

A. Staff's concern is put in terms of transferring assets when there is "inadequate competition." Specifically, Staff states:

> In particular, Staff has concerns about the market power impacts of transfer of generating assets from a utility to an affiliate where there is inadequate competition to protect standard offer customers from market power abuse.[2] [Emphasis added]

At a later point in the same document, Staff reminds us that Standard Offer customers remain "captive customers" after the transfer if there is no competition. Specifically, Staff states:

> As a result, it is Staff's view that the very first issues that must be considered are the Transfer and Separation of Assets, along with consideration of the initial Market Power and Monitoring considerations arising from the removal of all or some generation currently used to supply standard offer customers from this Commission's jurisdiction. An orderly transition to competition necessitates that a competitive market be enabled, yet demands protection for **customers who continue to be captive**.[3] [Emphasis added]

My testimony addresses these issues.

III. SUMMARY OF TESTIMONY

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. I conclude that: (a) APS has generation and transmission market power; (b) if APS is allowed to unconditionally transfer its generation facilities to an Affiliate, it will also be transferring its market power to that Affiliate; and (c) because the Commission will have

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[1] Procedural Order (May 2, 2002) page 1 line 25 to pages 2 line 3.

[2] Staff's Response to Arizona Public Service Company's Motion for Determination of Threshold Issue in Docket No. E-01345A-01-0822 (april 2002) at page 2, line 22 to 24.

[3] Id., page 4 lines 20 to 25.

less authority after the transfer to prevent harm to consumers from the exercise of market power by that Affiliate, it must ensure that, prior to such transfer, APS' market power will be mitigated.

Accordingly, I recommend that the Commission prohibit the asset transfer until APS has plans in place to competitively procure, or has competitively procured, 100% of its Standard Offer service requirements. In addition, the Commission should (a) require APS to establish short-term energy markets, including a real-time balancing market; (b) require APS to provide an opportunity for all generators selected by competitive procurement or by the short-term markets to be designated Network Resources; and (c) require APS to issue RFP(s) for generation within the constrained Valley region.

IV. APS HAS MARKET POWER IN ITS SERVICE TERRITORY IN BOTH GENERATION AND TRANSMISSION. THAT MARKET POWER MUST BE MITIGATED PRIOR TO THE TRANSFER OF APS' GENERATORS TO ITS UNREGULATED AFFILIATE. SUCH MITIGATION CAN BE ACCOMPLISHED IF, AND ONLY IF, COMPETITIVE POWER SUPPLIERS ARE PROVIDED A FORUM IN WHICH TO COMPETE.

Q. DO YOU BELIEVE STAFF'S MARKET POWER CONCERNS ARE JUSTIFIED?

A. Yes. Staff raises two key, legitimate concerns. First, unless APS' market power is mitigated prior to the transfer, APS' market power will simply be bequeathed to its Affiliate, Pinnacle West Energey Corporation (PWEC). As Staff puts it, current Standard Offer customers would become "captive customers" of PWEC, and then the Commission would have no control because PWEC is not subject to the Commission's jurisdiction.

Second, only by ensuring adequate competition before the transfer can the Commission protect these captive customers after the transfer. For this very reason, APS gained the right to transfer its generation assets only if it agreed to comply with the Electric Competition Rules, including that it competitively procure 100% of the power to fulfill its Standard Offer needs.[4] Competitive procurement was the quid pro quo for the

[4] Addendum to Settlement Agreement II 5(3). Rebuttal Testimony of Jack E. Davis in Docket No. E-01345A-01-0822, et al. (April 2002) at pages 13-14.

asset transfer. APS should not be allowed to transfer its assets to PWEC until it fulfills its promise to conduct competitive procurement.

Q. DO YOU OPPOSE, UNDER ALL CIRCUMSTANCES, APS' DIVESTITURE TO AN AFFILIATE?

A. Not at all. I would not oppose the asset transfer contemplated by APS provided APS mitigates its generation market power, rather than bequeathing market power to its unregulated Affiliate, as a precursor to full competition as provided for in the Electric Competition Rules.

Q. WOULD THIS CONCERN WITH MARKET POWER PERSIST EVEN IF THE TRANSFER ENTAILED A CONTRACT TO SELL BACK AT COST-PLUS RATES?

A. Yes, absolutely. The exercise of market power in this case means that, for a sustained period of time, Standard Offer customers would pay higher prices, face greater risks, and suffer lower reliability with PWEC service than they would if served by competing suppliers. As explained in my Testimony in the variance proceeding, which I incorporate here by reference, I am convinced this would have been the fate of Standard Offer customers had the Affiliate PPA with PWCC been approved. The Affiliate PPA, with a potential 29-year term, underscores precisely why the Commission must be concerned with market power, even with a cost-plus contract between APS and an Affiliate. Even under a cost-plus contract, APS can can simply bequeath its market power to an Affiliate and ignore the competitive challenge from several thousand megawatts of new merchant generators.

Q. HOW DOES FERC ASSESS GENERATION MARKET POWER?

A. At present, FERC does this by means of the Supply Margin Assessment (SMA) test for areas outside FERC-approved, operational Regional Transmission Organizations (RTOs).[5]

Q. WHAT IS THE BASIC POINT OF THE SMA?

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[5] *AEP Power Marketing Inc.*. 97 FERC ¶ 61,219 (2001).

A. The SMA seeks to determine if a supplier is "pivotal" in a market. In this case "pivotal" means that the supplier's capacity is essential to meeting the market's peak load. The theory behind the SMA is that, if the supplier's capacity is essential to meeting the peak load, it has the opportunity to drive prices above the levels that would otherwise prevail in a competitive market.

Q. WHAT CALCULATIONS ARE NEEDED TO CONDUCT AN SMA?

A. The actual calculations in an SMA are straightforward. First, we determine the supply margin, which equals the total supply into the market less the peak load in that market. Total supply equals all in-area generation plus imports from adjoining (or "first-tier") markets. Imports are the lesser of (a) the total transfer capability (TTC) from the adjoining areas or (b) the generation capacity available to be exported from those adjoining areas.

Second, we compare the supply margin to the applicant's capacity in that market. If the applicant's capacity is less than the supply margin, the applicant is not deemed to be "pivotal" and, therefore, passes the SMA. If the applicant's capacity exceeds the supply margin, the applicant is deemed to be "pivotal," fails the SMA test, and it is presumed to have generation market power. Consequently, its ability to conduct market-based transactions within that relevant market would be mitigated.

Q. PLEASE PROVIDE A SIMPLE EXAMPLE OF THE SMA CALCULATION.

A. Assume a hypothetical market has ten, equal-sized suppliers, each with 100 MW of capacity; therefore the total supply to that market is 1,000 MW. Assume further that peak demand in that market is 800 MW. With this assumption, the "supply margin" is 200 MW (1,000 MW of supply less the 800 MW peak demand). Since all ten suppliers have less than the supply margin, meaning no one supplier is indispensable to meeting that peak, all ten would pass the test.

Q. CAN THE SMA BE CONDUCTED FOR APS?

A. Yes. However, at the outset let me note that there are always assumptions to be made in

an SMA or any quantitative measure of market power, so allow me to start with a base case SMA and then do alternative SMA calculations to reveal the importance of a few assumptions about the extent of competition.

Q. PLEASE DISCUSS ALL THE RESULTS OF THE KEY CALCULATIONS FOR YOUR BASE CASE SMA FOR APS.

A. Certainly. In this base case, total in-area generation for the APS Market, APS's existing control area, in 2003 is 16,315 MW and has four components:

(a) existing APS-owned, in-area generation (3,710 MW);

(b) new APS Affiliate, in-area generation (1,680 MW from the West Phoenix expansion and Red Hawk);

(c) in-area utility generation not owned by APS (4,405 MW mainly from co-owners of Palo Verde, Four Corners, and Cholla); and

(d) new, in-area unaffiliated generation owned by Merchants (6,520 MW).

Q. WHAT IS THE QUANTITY OF POTENTIAL POWER IMPORTS?

A. Imports are assumed to equal the TTC of 3,900 MW.

Q. WHAT IS THE TOTAL SUPPLY INTO THE APS MARKET?

A. Total supply into the APS Market, therefore, is 20,215 MW (16,315 MW in-area plus 3,900 MW of imports).

Q. WHAT IS THE PROJECTED PEAK LOAD FOR APS?

A. Projected peak load for 2003 is 5,911 MW.

Q. WHAT IS THE SUPPLY MARGIN GIVEN THESE CALCULATIONS?

A. The supply margin is 14,304 MW (20,215 MW of supply less the 5,911 MW peak load).

Q. IN THE BASE CASE, DOES APS PASS THE SMA?

A. Yes. The base case supply margin exceeds APS-owned capacity of 5,705 MW (5,390 MW in-area plus 315 MW from Navajo), so APS passes the SMA.

Q. WOULD YOU PLEASE SUMMARIZE YOUR BASE CASE SMA IN A TABLE?

A. Yes. Table One below summarizes my base case SMA for the APS Market.

Table One

THE BASE CASE SMA FOR THE APS MARKET
(All values in MW)

In-Area Capacity	**16,315**
Imports	**3,900**
Total Supply	**20,215**
Projected Peak load	**5,911**
Supply Margin	**14,304**
APS Capacity	**5,705**
Pass/Fail SMA	**Pass**

Source: Exhibit No. CRR-2

Q. DO YOU BELIEVE THE BASE CASE IS AN ACCURATE ASSESSMENT OF APS' GENERATION MARKET POWER?

A. No.

Q. WHY NOT?

A. There are three assumptions within the base case SMA that create an understatement of APS' true generation market power.

Q. WHAT IS THE FIRST ASSUMPTION?

A. The first assumption is that in-area Merchants have the opportunity to compete against APS. This is item (d) mentioned above.

Q. IN WHAT CIRCUMSTANCES CAN MERCHANTS COMPETE AGAINST APS?

A. Merchants can compete against APS if and only if they have the opportunity to compete. If APS can simply push these Merchants aside and declare itself or its Affiliate the sole or primary supplier for its Standard Offer load, as it attempted to do through its proposed Affiliate PPA, then APS has the ability to exercise market power.

Q. WHAT IS THE SECOND ASSUMPTION?

A. The second assumption is that non-APS, in-area utility generators are considered competitors to APS. This is item (c) mentioned above. If this generation is committed to other loads and can not be used to undercut an attempt by APS to raise prices above

competitive levels, then this generation should not realistically be included as competing generation in the SMA calculations. Moreover, these competitors also can be blocked by APS exercising market power through an Affiliate PPA, as APS has already proposed.

Q. IF THESE TWO CATEGORIES OF IN-AREA COMPETITORS ARE NOT ALLOWED TO COMPETE, HOW DOES THE SMA CHANGE?

A. Absent the competition from in-area Merchants and non-APS, utility suppliers, the supply margin falls to 3,379 MW. This is significantly less than APS-owned capacity (5,705 MW) and, therefore, APS fails the SMA.

Q. WOULD YOU PLEASE SUMMARIZE YOUR SMA CALCULATIONS IN THE ABSENCE OF COMPETITION FROM BOTH IN-AREA MERCHANTS AND NON-APS, UTILITY GENERATION?

A. Yes. Table Two below summarizes my SMA calculations when neither of these categories of potential in-area suppliers can compete.

Table Two

THE SMA WHEN MERCHANTS AND NON-APS IN-AREA UTILITY GENERATION CANNOT COMPETE IN THE APS MARKET
(All values in MW)

In-Area Capacity	**5,390**
Imports	**3,900**
Total Supply	**9,290**
Projected Peak load	**5,911**
Supply Margin	**3,379**
APS Capacity	**5,705**
Pass/Fail SMA	**Fail**

Source: Exhibit No. CRR-2

Q. WHAT IS THE THIRD ASSUMPTION?

A. The third assumption is that the Western U.S. has sufficient generating capacity to export up to 3,900 MW to APS. Recall that the SMA asks that imports be reflected as the lower of (a) the TTC or (b) excess generating capacity available for export from the adjoiing

markets. The base case is very conservative. I used the TTC rather than determining how much generation is actually available to export to Arizona.[6] But, given the experiences in 2000, there is reason to believe this is overly optimistic, and certainly not a basis for concluding that significant levels of imports will in fact be available for disciplining APS market power. This gives added importance to ensuring in-area Merchants are allowed to compete with APS.

Q. IS THE SMA THE ONLY TEST FOR GENERATION MARKET POWER?

A. No. And, as with any quantitative measure of market power, SMA has shortcomings. I present it here to provide some quantitative results to support a basic principle using the market power test currently employed by FERC.

But, let's simplify the evidence: There is no competition without real competitors. There are three types of competitors for APS' and its Affiliates own power plants and each type can be eliminated by either market conditions or APS market power.

- The first type of competitor is in-area Merchants; it is the largest type with 6,520 MW. If APS succeeds in denying these suppliers an opportunity to compete by refusing to conduct competitive procurement, it succeeds in eliminating this type of competition by exercising generation market power.
- The second type of competitor is chiefly utility co-owners of three plants (Cholla, Palo Verde, and Navajo); this type has 4,405 MW. These co-owners probably have previously committed this capacity to their own load and so market conditions may eliminate these competitors, or they could be eliminated by APS exercising generation market power.
- The third type of competitor is out-of-area suppliers who must gain access through APS controlled transmission; this type is assumed to have 3,900 MW. If there is little excess capacity in the West, these competitors may be eliminated by market

[6] The analysis is also conservative for other reasons. I have not considered the impact of reserve requirements on available generation. Consequently, the SMA analysis is likely to understate APS's market power.

conditions. Or, they can be eliminated if APS exercises transmission market power.

My point is that, regardless of the analytic method used, all three types of competitors are in a position to be eliminated by APS exercising generation or transmission market power. In this sense, APS market power is clearly a concern.

Q. WHAT SORT OF MARKET POWER MITIGATION DO YOU BELIEVE WOULD ADDRESS THIS CONCERN?

A. Since APS' (and its Affiliates') market power will continue until such time as there is an opportunity for Merchants to compete, the best mitigation is to create one or more such opportunities. The two opportunities I have in mind are (a) competitive procurement in the form of requests for proposals (RFPs) and bilateral arms-length negotiation for longer-term PPAs and (b) the creation of one or more short-term electricity markets.

Q. HAVE APS WITNESSES ADDRESSED THE ISSUE OF MARKET POWER IN PREVIOUS TESTIMONY?

A. Yes, but not in any depth. For example, Dr. William Hieronymus addresses market power in his rebuttal testimony in the APS variance proceeding.[7] At the outset he says APS "easily would pass the new Supply Margin Assessment market power standard adopted by FERC late last year."[8] As my SMA results show, this is true if and only if Merchants and other in-area, non-APS utility generation are given a fair opportunity to compete, pursuant to Rule 1606(B) or such other processes as is adopted by the Commission in the Track B proceeding.

Q. DOES HE MAKE ADDITIONAL COMMENTS?

A. Yes. Dr. Hieronymus makes several comments that perpetuate misconceptions about market power in the electricity business. Let me make a few clarifying points.

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[7] Rebuttal Testimony of William H. Hieronymus (Docket No. E-01345A-01-0822, et al) page 17 line 17 to page 19 line 17.

[8] Id. at page 17 line 23 to page 18 line 1.

- Market power is not just a problem in short-term ("spot") markets, it can be exercised in long-term markets as well. Indeed, exercising market power in longer-term sales clearly has a larger impact on ratepayers because it can lock in market power for years and, thereby, can raise prices well above competitive levels for a larger volume of electricity sales for a longer period of time.
- As already noted, a longer-term contract with an affiliate mitigates market power if and only if the price and non-price terms of that contract result from or are otherwise challenged through competitive procurement processes. To illustrate, if a supplier was said to be exercising market power by selling at a $500/MWH price for one hour in a spot market, clearly that market power is not mitigated if the supplier simply offers to sell at $500/MWH under a 10-year PPA. In other words, it is not the contract or its term that mitigates market power, it is the fact that the underlying price has been shown to be at competitive levels.
- The exercise of market power in the electricity business is not confined to the tactic of withholding supply. If APS can simply push competitors aside and impose its high-priced Affiliate PPA on ratepayers, that is another way to exercise market power.
- Market power is not only about a utility's sales to other utilities. A utility can exercise market power in its home market. Dr. Hieronymus is wrong to say "whether PWEC might or might not be in a position to exercise market power over sales to APS is frankly irrelevant."[9] Far from being irrelevant, it has been set by the Commission as the key issue in Track A of this proceeding.

[9] Id. at page 19 lines 14-15.

V. ADDITIONAL MITIGATION IS REQUIRED TO ADDRESS APS' MARKET POWER IN THE TRANSMISSION CONSTRAINED AREA OF PHOENIX.

Q. ARE QUANTITATIVE TESTS FOR MARKET POWER LIMITED TO A SINGLE GEOGRAPHIC AREA?

A. No. Quantitative tests for market power are often done for sub-markets within a larger market, typically when there are significant transmission constraints into the sub-market. For example, an assessment for New York City alone is often added to a broader assessment of the New York market as a whole. Similarly, in PJM, a separate assessment of the transmission constrained area known as PJM East is often added to an assessment of the entire PJM market.

Q. SHOULD ANY SUB-MARKETS BE ASSESSED FOR APS?

A. Yes. A separate assessment is required of the APS load served in Phoenix. I will call this the APS Valley Market.

Q. WHAT IS THE IN-AREA GENERATION FOR THIS MARKET?

A. In-area generation in the APS Valley Market includes only APS capacity, which totals 1,393 MW.

Q. WHAT IS THE IMPORT TRANSMISSION CAPACITY?

A. Import transmission capacity is 3,685 MW into the APS Valley Market. Added to in-area generation capacity this brings total supply to 5,078 MW.

Q. WHAT IS PROJECTED LOAD?

A. Projected peak load for 2003 in the APS Valley Market is 4,112 MW.

Q. WHAT ARE THE RESULTS OF THE SMA?

A. The supply margin in the APS Valley Market is only 966 MW. Even if we compare the supply margin to only APS in-area generation, APS fails the SMA because its in-area generation of 1,393 exceeds the supply margin.

APS actually fails the test by a wider margin if, as is appropriate, we allocate some

share of the import transmission capacity to APS. Even assigning APS just a pro rata share of transmission capacity, means that another 987 MW should be added to APS capacity.[10] With this alternative allocation, APS fails the SMA more dramatically because its total generation is 2,380 MW, which exceeds the supply margin of just 966 MW.

Q. WOULD YOU PLEASE SUMMARIZE THIS SMA?

A. Yes. The SMA for the APS Valley market is summarized in Table Three below.

Table Three

THE SMA FOR THE APS VALLEY MARKET
(All values in MW)

In-Area Capacity	**1,393**
Imports	**3,685**
Total Supply	**5,078**
Projected Peak load	**4,112**
Supply Margin	**966**
APS Capacity	**2,380**
Pass/Fail SMA	**Fail**

Source: Exhibit No. CRR-2

Q. WHAT DOES THIS SMA FOR THE APS VALLEY MARKET MEAN?

A. It means that APS has generation market power in the APS Valley Market. The Commission must therefore put mitigation measures in place for the APS Valley Market before allowing a transfer of assets to APS unregulated Affiliate.

Q. WHAT KIND OF MITIGATION SHOULD THE COMMISSION PUT IN PLACE?

A. I have two sorts of mitigation in mind. The first is to ensure that competitors have full access to the 3,685 MW of import transmission capacity into the APS Valley Market. The second is to ensure competition for APS/PWEC in-area generation through competitive procurement.

Q. DOES APS HAVE *TRANSMISSION* MARKET POWER?

[10] Pro rata means in proportion to its share of all generation outside the APS Valley Market, but inside the APS service territory.

A. Yes. Obviously, APS is a transmission monopoly. I say "obviously" because: (a) no competitor can build transmission facilities into or within the APS control area; (b) no competitor can import power into or distribute power within APS' control area without APS' consent; (c) APS is regulated by FERC as a transmission monopoly, and (d) APS is not part of an operational RTO, as required by FERC.

Q. WHAT MITIGATION DOES FERC REQUIRE FOR APS' TRANSMISSION MARKET POWER?

A. FERC has concluded that just having an open access transmission tariff (OATT) is not enough. Rather, transmission providers should participate in an RTO that will adopt the standard market design FERC is now developing. I do not expect an RTO (or any interim independent system operator or administrator) to be in operation before asset transfer, so the Commission will have to order some limited, interim transmission market power mitigation consistent with FERC precedent. The specific mitigation I have in mind is that the Commission must ensure that all generators within APS' control area have the opportunity to be treated comparably to APS' own generation by ensuring that these generators can be studied as and designated Network Resources.

VI. RECOMMENDATIONS TO THE COMMISSION

Q. WHAT ARE YOUR CONCLUSIONS BASED ON YOUR TESTIMONY?

A. My primary conclusion is that APS has both transmission and generation market power in both the APS Market as a whole and in the APS Valley Market. APS' generation market power in the market as a whole would continue if the Affiliate PPA were approved, effectively blocking competition from third-party suppliers.

Q. WHAT DO YOU RECOMMEND TO THE COMMISSION?

A. I recommend that the Commission prohibit the transfer of APS generation assets to its Affiliate unless and until the Affiliate will, in fact, face a competitive challenge on the price and non-price terms at which it will sell back to APS to serve Standard Offer

customers.

Q. ARE YOU CONCERNED IF THE ASSET TRANSFER IS NOT COMPLETED BY YEAR-END 2002?

A. No. The Commission's goal is to do the best it can for consumers and it should take the time needed to achieve that goal. The Commission still could make it clear to financial institutions and to other market participants that the transfer will happen, albeit at a slower pace.

Q. WHAT SPECIFIC MITIGATION MEASURES DO YOU RECOMMEND?

A. I recommend four specific mitigation measures.

Q. WHAT IS YOUR FIRST RECOMMENDED MITIGATION?

A. First, competitive procurement must be conducted for any capacity needed to serve Standard Offer customers under a contract with a term of one-year or more. Again, competitive procurement means both requests for proposals (RFPs) and competitive, arms-length, bilaterial negotiation. All competitive procurement should be designed and conducted with the goal of getting the best deal for APS' Standard Offer customers in terms of price, risk, and reliability.

The details of the competitive procurement will be worked out in Track B of this proceeding, but one crucial element is that the APS Affiliate must bid like any other bidder and be held to its bid if it wins. Competitive negotiation can only be used with non-affiliates. Obviously, APS cannot conduct an arms length negotiation with either PWCC or PWEC.[11]

Q. WHAT PORTION OF THE POWER NEEDS OF STANDARD OFFER CUSTOMERS DO YOU SEE BEING MET THROUGH COMPETITIVE PROCUREMENT?

A. I expect APS to competitively procure most of the power it needs for Standard Offer customers. The contract lengths and start dates will vary, but, as a group, these contracts

[11] Davis Deposition Transcript at page 22-23. Indeed, I understand that, with the proposed Affiliate PPA, one person approved the PPA for both APS and PWCC.

could account for up to 95% of capacity needs. As to contract lengths, I would expect APS, based on risk mitigation principles, to have a portfolio of multi-year (5-, 10-, and 15-year) PPAs.

Q. WHAT IS THE SECOND MITIGATION MEASURE YOU RECOMMEND?

A. Second, one or more short-term electricity markets must be established for all purchases with a term shorter than one year.

Q. WHY MUST THESE SHORT-TERM MARKETS BE ESTABLISHED?

A. These short-term markets are another way to achieve consumer benefits. There will be power plants in Arizona and in other Western States that do not sell to APS most of the time. But, for shorter periods of time, these plants may have low-cost capacity and energy to sell. These short-term markets will ensure Arizona ratepayers receive the benefit of that low-cost capacity and energy if and when it is available.

Q. WHAT IS THE NATURE OF THE SHORT-TERM MARKET YOU ENVISION?

A. The market may range from a real-time market to a day-ahead market to a monthly or seasonal market for capacity and/or energy, or some combination of markets. It is important to realize, though, that this market is in no way, shape or form intended to take the place of long-term procurement, but merely to serve as an additional procurement option to cover short term needs.

Q. WHAT PORTION OF STANDARD OFFER NEEDS DO YOU SEE BEING PROCURED IN THESE MARKETS?

A. I see these markets accounting for as little as 5% of the power needed to serve Standard Offer customers.

Q. DO YOU ANTICIPATE AN RTO WILL ESTABLISH THESE MARKETS?

A. Markets established by a FERC-approved RTO likely will satisfy this recommendation, but interim markets established by APS will have to be implemented because an RTO will not be in place before APS wants to complete its asset transfer. However, I do not see a

problem with transferring operation of these markets to a FERC-approved RTO once it is established and operating.

Q. WILL APS RUN THESE MARKETS ALONE?

A. It depends. If APS operates under codes of conduct that ensure its loyalties are to its ratepayers only, it can run these markets alone. If not, a third party should be brought in.

Q. WHAT IS THE THIRD MITIGATION MEASURE YOU RECOMMEND?

A. Third, there can be no preferential access given to APS (or its Affiliates) generation assets for transmission capacity into or within APS' service territory. To that end, all generation with a signed interconnection agreement, or for whom interconnection studies have been completed and that competes in the APS Market should be designated as a Network Resource by APS. That is, all will be treated equally as suppliers serving APS native load.

Q. HOW WILL THIS BE ACHIEVED?

A. It will be achieved by the Commission making it a condition of asset transfer. For example, acting on behalf of Standard Offer load, APS will be required to designate as a Network Resource all winners of any competitive procurement.

Q. HAS FERC GONE IN THIS DIRECTION?

A. Yes. In its well publicized orders involving Entergy, AEP, and Southern, FERC said generators have the right to be studied as a Network Resource when requesting interconnection.[12] More importantly, FERC is codifying such a requirement through its April 24, 2002 Notice of Proposed Rulemaking (NOPR).[13]

In the NOPR, there are two types of interconnection service: (a) Energy Resource Interconnection Service and (b) Network Resource Interconnection Service (NRIS). The latter is most relevant here in terms of serving Standard Offer customers. With NRIS, Merchants have the opportunity to be on an equal footing with the incumbent utilities' generation used to serve native load. The NOPR states that with NRIS:

[12] *See AEP Power Marketing, Inc.* 97 FERC ¶ 61,219 (2001).
[13] Standard Generator Interconnection and Operating Agreement FERC Docket No. RM02-1-000 (2002).

> The Transmission Provider must conduct the necessary studies and construct the Network Upgrades needed to integrate the Facility (1) in a manner comparable to that in which the Transmission Provider integrates its generating facilities to serve native load customers.[14]

Since APS is buying on behalf of its Standard Offer customers, APS would arrange for transmission service beyond the point of interconnection. Since projects with completed interconnection studies already can deliver their output to the grid, there is no reason why APS should not be required to treat these projects precisely as it would treat one of its own projects; i.e., as a Network Resource comparable to how APS uses its own plants to serve its native load.

Q. WHAT IS THE FOURTH MITIGATION MEASURE YOU RECOMMEND?

A. Fourth, in the absence of dramatic improvements in transmission, an RFP must be conducted to invite competitive power suppliers to bid from facilities built in the APS Valley Market, in competition with in-area APS capacity. The time frame for bids will be set long enough to allow time for siting in the APS Valley Market. I would expect competitive power suppliers to offer to build new combustion turbine facilities in the APS Valley Market.

Q. WHAT IF THERE IS NO RESPONSE TO THE IN-VALLEY RFP?

A. If insufficient competition is brought forth by the in-Valley RFP, during periods of congestion, APS should be limited to charging a capacity and energy price not to exceed that expected from competition. Specifically, this price should be set at the cost of a proxy plant based on the capacity, energy, and operating costs of a new combustion turbine. The proxy price can also be used in the interim period between (a) the time APS existing in-area capacity must be used and (b) the date on which the winning bidder will come on line in the Valley Market.

Q. YOU MENTIONED CODES OF CONDUCT. DO YOU HAVE ANY SUGGESTIONS

[14] Id. at page 12.

IN THIS REGARD?

A. Yes. I recommend that the Commission require PWEC to be a wholly separate corporation from APS to accommodate the asset transfer in accordance with FERC's proposed Standards of Conduct.[15]

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

1306045.1/73262.005

[15] Standards of Conduct for Transmissio nProvider in Docket No. RM01-10-000 (2001).

Exhibit No.__ (CRR-1)

LIST OF TESTIMONY AND OTHER PUBLICATIONS FOR CRAIG R. ROACH, Ph.D.

BOSTON PACIFIC COMPANY, INC.

TESTIMONY

Direct Testimony concerning a proposed Affiliate power purchase agreement and requested waiver from competitive bidding rules, Arizona Corporation Commission Docket No. E-00000A-02-0051, et al. [March 2002] For Panda Gila River, L.P.

Direct Evidence concerning a proposal for transmission congestion management and expansion cost allocation, Alberta Energy and Utilities Board, Application No. 1248859. [March 2002]. For TransCanada Energy Ltd.

Direct Evidence concerning competitive procurement and pricing for transmission must run and other ancillary services, Alberta Energy and Utilities Board, Application No. 1244140. [February 2002]. For Ancillary Services Group.

Comments concerning market power mitigation by RTOs, Federal Energy Regulatory Commission Technical Conference on Standard Electricity Market Design, Docket No. RM01-12-000. [February 2002].

Direct Testimony concerning prices and other terms and conditions for imbalance energy, Federal Energy Regulatory Commission Docket EL02-46-000. [January 2002]. For Generator Coalition.

Direct Testimony concerning energy market conditions and energy availability in New Orleans, City Council of New Orleans, Docket No. UD-00-2. [January 2002]. For Thomas Lowenburg, et al.

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Exhibit No.__(CRR-2)

SMA SUPPORT DOCUMENTATION

SMA Support Documents - APS Generation

Current Plants in APS Area

Plant, Location	Type	Summer Capacity	APS Capacity	Other Capacity
Childs 1, Camp Verde AZ	HY	1	1	-
Childs 2, Camp Verde AZ	HY	1	1	-
Childs 3, Camp Verde AZ	HY	1	1	-
Cholla 1, Joseph City AZ	ST	110	110	-
Cholla 2, Joseph City AZ	ST	245	245	-
Cholla 3, Joseph City AZ	ST	260	260	-
Cholla 4, Joseph City AZ	ST	380	0	380
Douglas GT1, Douglas AZ	GT	16	16	-
Four Corners 1, Farmington NM	ST	170	170	-
Four Corners 2, Farmington NM	ST	170	170	-
Four Corners 3, Farmington NM	ST	220	220	-
Four Corners 4, Farmington NM	ST	740	111	629
Four Corners 5, Farmington NM	ST	740	111	629
Irving 1, Camp Verde AZ	HY	1	1	-
Ocotillo 1, Tempe AZ	ST	111	111	-
Ocotillo 2, Tempe AZ	ST	111	111	-
Ocotillo GT1, Tempe AZ	GT	54	54	-
Ocotillo GT2, Tempe AZ	GT	49	49	-
Palo Verde 1, Wintersburg AZ	NP	1,243	361.96	881
Palo Verde 2, Wintersburg AZ	NP	1,243	361.96	881
Palo Verde 3, Wintersburg AZ	NP	1,247	363.13	884
Saguaro 1, Red Rock AZ	ST	100	100	-
Saguaro 2, Red Rock AZ	ST	99	99	-
Saguaro GT1, Red Rock AZ	GT	47	47	-
Saguaro GT2, Red Rock AZ	GT	47	47	-
Solar (9), Arizona	PV	1	1	-
Valencia 1, Nogales AZ	IC	1	0	1
Valencia 2, Nogales AZ	IC	1	0	1
Valencia 3, Nogales AZ	IC	1	0	1
Valencia 4, Nogales AZ	IC	1	0	1
Valencia GT1, Nogales AZ	GT	14	0	14
Valencia GT2, Nogales AZ	GT	14	0	14
Valencia GT3, Nogales AZ	GT	14	0	14
West Phoenix 4, Phoenix AZ	ST	33	33	-
West Phoenix 5, Phoenix AZ	ST	12	12	-
West Phoenix 6, Phoenix AZ	ST	63	63	-
West Phoenix CC1, Phoenix AZ	CS	80	80	-
West Phoenix CC2, Phoenix AZ	CS	80	80	-
West Phoenix CC3, Phoenix AZ	CS	80	80	-
West Phoenix GT1, Phoenix AZ	GT	50	50	-
West Phoenix GT2, Phoenix AZ	GT	50	50	-
Yucca GT1, Yuma AZ	GT	18	18	-
Yucca GT2, Yuma AZ	GT	18	18	-
Yucca GT3, Yuma AZ	GT	52	52	-
Yucca GT4, Yuma AZ	GT	51	51	-
Yuma Axis 1, Yuma AZ	ST	75	0	75

APS Out-of-Area Generation

Navajo 1, Page AZ	ST	750	105	645
Navajo 2, Page AZ	ST	750	105	645
Navajo 3, Page AZ	ST	750	105	645

Total Capacity (In area)	8,115	3,710	4,405
Total APS Capacity (Out-of-area)	315		

Total APS Capacity	4,025
Total Other In-Area Capacity	4,405

Source Western Systems Coordinating Council Summary of Estimated Loads and Resources
Existing Generation & Significant Additions and Changes to System Facilities 2000-2010
Dated May 2001, Data as of January 1, 2001
West Phoenix 4-6 Listed as mothballed, but returned to service in 2001

SMA Support Documents - Generation Additions

Merchants in APS Service Area by 2003

Plant Name	Location	MW
Desert Basin	Casa Grande, AZ	520
West Phoenix	Phoenix, AZ	620
Arlington Valley 1-2	Arlington Valley, AZ	1,180
Gila River 1-4	Gila Bend, AZ	2,080
Redhawk 1-2	Palo Verde, AZ	1,060
Sundance	Coolidge, AZ	450
Harquahala	Harquahala, AZ	1,040
Mesquite	Arlington, AZ	1,250

Total MW	8,200
APS Owned	1,680
Other Owned	6,520

Source: Testimony of Jerry Smith in Docket E-01345A-01-0822, March 29, 2002
Plants out of APS service area were removed

SMA Support Documents - Imports and Loads

Imports into Phoenix from other APS Units

Total In-Area Capacity for APS Territory	16,315
less West Phoenix	448
less Ocotillo	325
less West Phoenix Additions	620
Total In-Area Capacity for APS Territory Outside of Phoenix	14,922
Total APS Owned In-Area Capacity	5,390
less APS Capacity in Phoenix	1,393
APS In-Area Capacity Outside of Phoenix	3,997
APS In-Area Market Share Outside of Phoenix	27%
TTC into APS Phoenix Area*	3,685
APS Share of TTC into APS Phoenix Area	987

Peak Load in 2003

APS System-Wide Peak Load*	5,911
APS Phoenix Peak Load*	4,112

* Rebuttal Testimony of Cary Deise, Docket E-01345A-01-0822, et al.