0000000831

ORIGINAL

LOW & CHILDERS, P.C.

ATTORNEYS AT LAW

2999 North 44th Street, Suite 250 • Phoenix, Arizona 85018
Telephone: (602) 266-1166 • FAX: (602) 808-8835

J. Michael Low
S. David Childers
Christy C. Brown
Tasha N. Cycholl
Lenin Arthanari

Steven R. Henry
1948-2003

WRITER'S DIRECT E-MAIL: tcycholl@lowchilders.com

February 3, 2004

RECEIVED
2004 FEB -3 P 3:02
AZ CORP COMMISSION
DOCUMENT CONTROL

VIA HAND DELIVERY

Docket Control
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

Re: ***Arizona Competitive Power Alliance***
Docket #: E-01345A-03-0437

To whom it may concern:

Pursuant to the Procedural Schedule, provided herewith, please find the testimony and exhibits of Jeffrey D. Tranen together with the testimony and exhibits of Joseph P. Kalt.

If you have any questions or concerns, please do not hesitate to contact David Childers or myself.

Very Truly Yours,

Tasha Cycholl

Tasha N. Cycholl
For the Firm

Arizona Corporation Commission
DOCKETED
FEB 03 2004
DOCKETED BY

TNC/rdj

Enclosures

cc:

(see mailing certificate attached)
S. David Childers, Esq. (w/o enclosures)
Christy C. Brown, Esq. (w/o enclosures)

G:\SECY4\ARIZONA COMPETITIVE POWER ALLIANCE \CORRESPONDENCE/LETTER TO ACC 2-3-04
11280-001

MAILING CERTIFICATE

Original and 13 copies of the foregoing filed
this 3rd day of February, 2004 with:

Docket Control
Arizona Corporation Commission
1200 W. Washington St.
Phoenix, AZ 85007

Copy of the foregoing hand-delivered this
3rd day of February, 2004 to:

VIA HAND DELIVERY

Lyn Farmer
Chief Administrative Law Judge
Hearing Division
Arizona Corporation Commission
1200 W. Washington St. **Room 104**
Phoenix, AZ 85007

Copies of the foregoing mailed this
3rd day of February, 2004 to:

Thomas L. Mumaw
Karilee S. Ramaley
PINNACLE WEST
CAPITAL CORPORATION
P.O. Box 53999, MS 8695
Phoenix, Arizona 85072-3999

Jeffrey B. Guldner
Faraq Sanei
SNELL & WILMER
One Arizona Center
400 E. Van Buren Street
Phoenix, Arizona 85004-2202
Attorneys for Arizona Public Service Company

C. Webb Crockett
FENNEMORE CRAIG
3003 N. Central Avenue, Suite 2600
Phoenix, Arizona 85012
Attorneys for AECC and Phelps Dodge

Major Allen G. Erickson
AFCES A/ULT
139 Barnes Drive, Suite 1
Tyndall AFB, Florida 32403-5319
Attorney for FEA

Michael L. Kurtz
BOEHM, KURTZ & LOWRY
36 E. Seventh Street, Suite 2110
Cincinnati, Ohio 45202
Attorneys for Kroger Company

Scott Wakefield
RUCO
1110 W. Washington St., Suite 220
Phoenix, Arizona 85007

Walter W. Meek
AUIA
2100 N. Central Ave., Suite 210
Phoenix, Arizona 85067

Nicholas J. Enoch
LUBIN & ENOCH
349 N. Fourth Avenue
Phoenix, Arizona 85003
Attorneys for IBEW

Bill Murphy
MURPHY CONSULTING
2422 E. Palo Verde Drive
Phoenix, Arizona 85016
Consultant for Arizona Cogeneration Assn.

Jay L. Shapiro
Patrick J. Black
FENNEMORE CRAIG
3003 N. Central Avenue, Suite 2600
Phoenix, Arizona 85012
Attorneys for Panda Gila River, L.P.

Robert W. Geake
ARIZONA WATER COMPANY
P.O. Box 29006
Phoenix, Arizona 85038-9006

Andrew W. Bettwy
Bridget A. Branigan
SOUTHWEST GAS CORPORATION
5241 Spring Mountain Road
Las Vegas, Nevada 89150

Timothy M. Hogan
ARIZONA CENTER FOR LAW
IN THE PUBLIC INTEREST
202 E. McDowell Rd., Suite 153
Phoenix, Arizona 85004
Attorneys for Western Resource Advocates

Paul R. Michaud
MARTINEZ & CURTIS, P.C.
2712 N. 7th Street
Phoenix, Arizona 85006-1090
Attorneys for Constellation NewEnergy, Inc., Strategic Energy, L.L.C. and Dome Valley Energy Partners, LLC

Raymond S. Heyman
Laura Schoeler
ROSHKA, HEYMAN & DeWULF
400 E. Van Buren, Suite 800
Phoenix, Arizona 85004
Attorneys for UniSource Energy Services

Deborah R. Scott
UNISOURCE ENERGY SERVICES
One South Church Street, Suite 200
Tucson, Arizona 85702

Michael L. Kurtz
36 E. 7th Street, Suite 2110
Cincinnati, Ohio 45202

J. William Moore
Attorney at Law
1144 E. Jefferson
Phoenix, Arizona 85034

Christopher Kempley, Chief Counsel
ARIZONA CORPORATION COMMISSION
1200 W. Washington Street
Phoenix, Arizona 85007

Ernest Johnson, Director of Utilities
ARIZONA CORPORATION COMMISSION
1200 W. Washington Street
Phoenix, Arizona 85007

Arizona Reporting Service, Inc.
2627 N. Third Street, Suite Three
Phoenix, Arizona 85004-1103

DIRECT TESTIMONY OF JEFFREY D. TRANEN

On Behalf of Arizona Competitive Power Alliance

Docket No. E-01345A-03- ___

FEBRUARY 3, 2004

Table of Contents

I QUALIFICATIONS AND INTRODUCTION

Q: **PLEASE STATE YOUR NAME, ADDRESS AND OCCUPATION.**

A: My name is Jeffrey Tranen. My business address is 145 East 76th Street, New York, NY. I am a Senior Vice President of Lexecon Inc., an FTI Company. Lexecon is a large consulting firm specializing in economics, energy, and finance. Lexecon professionals provide economic analysis and strategic advice to large industrial clients such as utilities, regulatory agencies, and other private and public sector entities.

Q: **PLEASE STATE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.**

A: I am an electrical engineer by training. I attended the Massachusetts Institute of Technology, where I received a B.S. and M.S. in electrical engineering, and subsequently an Electrical Engineer Degree (meaning I completed the course work, but not the dissertation, for a PhD). From 1970 to 1997, I held a variety of positions at New England Electric Systems ("NEES"), an electric utility holding company in New England. From 1993 to 1997, I was President of a NEES subsidiary, New England Power Company, which operated the wholesale generation and marketing business for NEES. From 1978 to 1997, I held various positions at NEES with responsibility for operating the transmission system as part of the New England Power Pool ("NEPOOL"). During my time at NEES, I served on numerous NEPOOL and North American Electric Reliability Council ("NERC") Committees. In addition, from 1995 to 1997, I served as Chairman of the NEPOOL Management Committee.

From September 1997 until March 1999, I was the CEO of the California Independent System Operator Corporation. My tenure there covered the startup and first year of commercial operation of the ISO (from April 1998 through March 1999). From March 1999 to February 2000, I was President of Sithe Northeast, a holding company that owned and operated generation in the ISO-run markets in place in New England, New York and PJM. Since Spring 2000, I have been employed by Lexecon working on a variety of federal and state regulatory matters related to the electricity industry. I have testified several times before state and federal regulatory commissions. Details regarding my educational background and experience can be found in Exhibit JDT-1.

Q: **ON WHOSE BEHALF IS YOUR TESTIMONY SUBMITTED?**

A: My testimony is submitted on behalf of the Arizona Competitive Power Alliance ("Alliance").

Q: **WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

A: I have been asked by the Alliance to review the request made by the Arizona Public Service Company ("APS" or the "Company") on June 27, 2003 for authorization from the Arizona Corporation Commission ("Commission") to transfer into APS's rate base at 2004 depreciated original cost approximately 1,700 MW of electricity generation capacity[1] built by its unregulated affiliate, Pinnacle West Energy Company ("PWEC") and to abrogate contracts APS recently executed with PWEC for summer capacity and energy through

[1] The plants are Red Hawk Units 1 & 2 with a capacity of 495 MW each; West Phoenix 4 at 120 MW; West Phoenix 5 at 525 MW; and, Saguaro SC 3 at 80 MW, which totals a little more than 1,700 MW of capacity.

2006 ("Track B Contracts").[2] My testimony analyzes and responds to APS's arguments in support of its request to rate base its affiliate's generation ("PWEC assets") and abrogate the Track B Contracts.

Q: **PLEASE PROVIDE AN OVERVIEW OF YOUR TESTIMONY.**

A: My testimony focuses on the following specific observations I make as a result of my analysis of the APS request:

- Over the near term (2004 through 2006), the cost to APS ratepayers of APS's proposal to rate base the PWEC assets and abrogate the Track B contracts is almost $115 million per year. At the same time, the addition of the PWEC assets to the rate base provides no material short-term reliability benefits over those already realized under the Track B Contracts.
- Over the longer term (post 2006), APS has not demonstrated that its ratebasing proposal is either necessary for reliability or provides economic benefits for APS ratepayers.
- Contrary to APS's assertions, there is considerable evidence that the competitive wholesale market will respond to a competitive solicitation by APS at the expiration of the Track B contracts in lieu of the proposed ratebasing, as long as this solicitation is fair and transparent.

---

[2] In my testimony, I refer to the APS purchase contracts with PWEC that resulted from the initial Track B solicitation that took place over the past year as the "Track B Contracts." Although I characterize the contracts as only being between APS and PWEC, I recognize in my analysis that APS has also entered into smaller supply contracts with other market participants as a result of the Track B process. When I refer to the revenue requirement excluding Track B Contracts in my testimony I am only eliminating the contracts

- The Commission's policy of encouraging a robust wholesale electricity market remains an important goal for Arizona retail customers. Rolling these plants into rate base, as opposed to requiring APS to continue to rely on the market for capacity requirements, runs counter to this goal and is not in the long term interest of APS customers.

II APS'S RATE BASING PROPOSAL RAISES NEAR-TERM RATES WITHOUT PROVIDING NEAR-TERM RELIABILITY BENEFITS OR CLEAR LONG-TERM BENEFITS.

II.A The Short-Term Impacts of APS's Proposal (through 2006).

Q: HAVE YOU ANALYZED THE IMPACT OF APS'S RATEBASING PROPOSAL ON ITS RATES?

A: Yes. In Exhibit JDT-2, I show that APS's proposal increases its revenue requirement by almost $115 million when compared to a test year that includes various medium-term market purchases (Track B Contracts and other anticipated medium-term and economy purchases). This represents approximately 65 percent of APS's proposed rate increase in this proceeding.[3] By requesting that PWEC assets be rolled into its rate base, APS is locking in unnecessarily higher rates for at least the years 2004-2006, and quite possibly longer, given the fact that APS already has available through contracts the quantity of

---

between APS and PWEC, not any other supply contract obligations that APS has with other market participants.

supply it would obtain through ownership of the PWEC assets during the peak summer months when needed to serve its load.

Q: **PLEASE DESCRIBE HOW YOU DEVELOPED YOUR ANALYSIS.**

A: To calculate the test year revenue requirement impact of APS's proposed treatment of the PWEC assets, I relied on cost data in the Company's rate case filing. Schedules B and C of the Company's filing show adjusted test year Rate Base and Income Statement results, as well as the cost impacts of ratebasing the PWEC assets. APS witness Donald G. Robinson discusses the rate base and income statement cost effects of the PWEC assets. Because Schedules B and C of APS's filing include both the adjusted test year results and the cost impacts of the PWEC assets, I was able to compare the Company's test year revenue requirement with and without PWEC assets in the rate base.

Q: **WOULD YOU EXPLAIN THE MECHANICS OF YOUR ANALYSIS?**

A: Yes. First, ratebasing the PWEC assets increases APS's test year revenue requirement by the amount required to provide a return on the capital associated with the assets. Placing the PWEC assets in APS's rate base increases the adjusted test year rate base by $890 million, an increase of more than 25%.[4] To calculate the revenue requirement associated with this increased capital investment, I applied the weighted average cost of capital reported in Mr. Robinson's testimony (8.67%).[5] I then used the "gross up" factor provided

---

[3] Mr. Wheeler testifies that APS is seeking higher annual revenues of approximately $175 million of which $115 is 65%. (Wheeler Direct Testimony at Page 3: 4–6)

[4] Schedule B-2 (Revised), 1:6, attached as Exhibit JDT-3.

[5] Direct Testimony of Robinson at Page 29: 20.

in Mr. Froggatt's testimony[6] and found a revenue requirement impact of $127 million. Mr. Robinson testifies that the transaction would lower APS's weighted average cost of capital to 8.31% by increasing the debt in APS's capital structure.[7] When this change in capital cost is applied to APS's entire rate base, and the lower income taxes associated with increased debt are considered, I find a revenue requirement reduction of $40 million. APS's test year revenue requirement is also affected by changes in several income statement items, reported in Schedule C-2 of the Company's filing. These items include fuel and purchased power costs to meet APS's own load, depreciation and amortization, operations and maintenance, and property taxes. Finally, Mr. Robinson testifies that APS's gross margin from off-system sales will be $32 million higher as a result of ratebasing the PWEC assets, thus reducing the revenue that APS says will be required from ratepayers based on the adjusted test year analysis. I then compiled these numerical values (Exhibit JDT-2) for the case where PWEC assets are in the rate base and for the case where PWEC assets are not in the rate base and calculated the difference. I then summed the differences to find that inclusion of the PWEC assets in rate base increases the Company's test year revenue requirements by almost $115 million per year.

Q: **CAN YOU EXPLAIN WHY APS'S RATE BASING PROPOSAL IS SO COSTLY AS DEMONSTRATED BY YOUR ANALYSIS?**

A: Yes. The market value of the energy and capacity provided by the PWEC assets, at least in the near-term, cannot support the carrying costs of the PWEC assets. This is not surprising

---

6 Direct Testimony of Froggatt at Page 7: 6.
7 Direct Testimony of Robinson at Page 29:19-22.

given the large increase in supply in the region in the past few years. This is clear by looking at the cost of energy under the Track B Contracts versus the carrying costs of the PWEC assets. As shown in Exhibit JDT-2, the reduction in fuel and purchased power by APS's abrogation of the Track B Contracts roughly equals the increased operations and maintenance costs associated with APS owning the PWEC assets. This leaves very little if any money to cover the roughly $180 million of return of and on capital associated with these assets, including taxes. APS claims they will have roughly $40 million savings associated with restructuring of their overall cost of capital and an additional roughly $30 million associated with margins from off-system sales from the PWEC assets. This leaves the roughly $115 million shortfall shown in Exhibit JDT-2. The off-system sales are derived primarily from sales during the eight months that these units are not needed to supply APS load. APS's own forecasts show that these units are projected to run at reduced capacity factors when compared to their original projections demonstrating that they are also not significantly needed off-system.[8] Thus the off-system sales cannot overcome the lack of need on the APS system and the high carrying costs associated with this excess capacity.

Q: **IS RATE BASING THE PWEC ASSETS REQUIRED FOR APS TO RELIABLY SERVE ITS PROJECTED DEMAND IN THE NEAR-TERM?**

A: No. APS has been making market purchases—including in particular the Track B Contracts—to ensure it has resources on hand to meet the majority of its summer peak

---

[8] See Exhibit JPK-7.

forecast in the near-term future. For example, Exhibits JDT-4, 5 and 6 present comparisons of APS monthly peak loads and its resource base for 2004 as of mid-2003. Exhibit JDT-4 shows that month-by-month APS has available surplus capacity to meet its projected monthly peak demand.[9] Moreover, Exhibits JDT-5 and 6 compare APS's resource base with and without the PWEC assets in the rate base against projected monthly loads. The Exhibits clearly show that APS's recent Track B purchases, combined with its own resources, very closely match near-term coverage of monthly demand. Additionally, Exhibit JDT-6 shows the extent to which the roll in would cause APS to have significant excess capacity in those months other than June-September when the Track B Contracts provide capacity resources to APS. Thus there is no material improvement in reliability in the near-term to justify the significantly higher costs proposed by rate basing the PWEC assets.

Q: **IS THE RATE BASING REQUIRED FOR APS TO RELIABLY SERVE ITS PROJECTED ENERGY REQUIREMENTS?**

A: No. Exhibit JDT-7 shows a comparison of projected 2004 APS customer monthly energy requirements compared to the amount of energy production APS has available to it both

---

[9] APS has revised its supply/demand projections as part of its Request for Proposal issued December 3, 2003. These revised projections indicate that APS may require additional purchases of energy and/or capacity during the 2004-2006 time period. The projections do not demonstrate, however, that the offsetting actions of rate basing the PWEC assets and abrogating the Track B Contracts could materially assist APS in serving these increased loads. Although APS may contend that these projected revisions are sufficient evidence that its current resource base is inadequate, as I discuss in Section III of my testimony, it is quite common for a utility to rely on the market for a portion of its supplies—especially when the need for the supplies is uncertain.

with and without the PWEC assets in the rate base.[10] The Exhibit clearly depicts the fact that the addition of the PWEC assets to the rate base results in considerable excess production capability for all those months other than June-September. Without the PWEC assets, APS's portfolio of supply much more closely matches the energy requirements of its customers. Thus, adding PWEC assets to rate base shifts the burdens and risks of marketing and selling large quantities of the energy available from the PWEC assets from PWEC to APS, and subsequently to APS's retail customers.

Q: **WHY WOULD THE RATE BASING OF THE PWEC ASSETS CREATE SO MUCH EXCESS ENERGY PRODUCTION CAPABILITY FOR APS?**

A: APS's load requirements for its customers are sharply higher in the summer months. In recent years, the annual load factor for the APS load is 52 -55%, which means that, on average, APS only needs one half of the energy that it needs in the peak demand hour of the year.[11] APS already has in its supply portfolio a significant amount of capacity that is capable of economically operating throughout the year toward satisfaction of its load requirements.

Mr. Bhatti's workpapers APB_WP9 reveal that APS expects to obtain more than 21,500 GWh or greater than 80% of its forecasted Standard Offer load of 26,494 GWh from its base load, low-cost power plants Palo Verde, Four Corners, Cholla and Navajo.[12] Mr.

---

[10] When developing this Exhibit, I excluded combustion turbines and hydroelectric facilities; these plants contribute only small amounts of energy to APS's overall energy supply.

[11] Workpaper APB_WP12, attached as Exhibit JDT-3.

[12] Workpaper APB_WP 9 and WP11, attached as Exhibit JDT-3.

Bhatti's analyses show that APS expects to enjoy access to this low cost power regardless of whether PWEC assets are in the rate base.

Q: **PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING THE NEAR-TERM IMPACT OF APS'S PROPOSAL TO RATE BASE THE PWEC ASSETS AND ABROGATE THE TRACK B CONTRACTS.**

A: I conclude that APS ratepayers will enjoy lower power supply costs without the PWEC assets in APS's rate base and that APS system reliability will be virtually unchanged. As I explain above, APS is asking the Commission to allow it to recover the considerable fixed costs of the PWEC assets that APS can avoid if it instead relies on the current Track B Contracts. APS has not shown that relying on Track B Contracts in the near term will result in any reduction in system reliability. On these facts alone, I believe that the Commission should reject APS's proposal.

II.B The Longer Term Impacts of APS's Proposal (Post 2006).

Q: **HAS APS SHOWN THAT OWNERSHIP OF THE PWEC ASSETS IS NECESSARY FOR IT TO RELIABLY SERVE ITS CONSUMERS POST 2006?**

A: No. APS witness Bhatti asserts in his testimony that the PWEC assets were built to serve APS and thus they are uniquely suited to the needs of APS.[13] However, Mr. Bhatti's contention that the assets must be owned in order for APS to operate its system reliably is limited to his identified Valley must-run requirements for PWEC Units West Phoenix 4 and

[13] Bhatti Direct Testimony at Pages 8-24.

5.[14] Dr. Hieronymus and Mr. Wheeler similarly assert that Valley unit must-run generation provided by West Phoenix 4 and 5 leads to greater system reliability.[15] Aside from the specific characterization of these resources as necessary for providing must-run generation in the Phoenix Valley load pocket at certain very limited times of the year, APS has not explained how ownership of the PWEC assets is required for system reliability.

Q: **WHAT ABOUT APS'S CLAIMS THAT IT SHOULD RATEBASE THE PWEC ASSETS BECAUSE THESE PLANTS PROVIDE APS'S VALLEY LOAD POCKET MUST-RUN RELIABILITY SERVICES?**

A: I have reviewed a recent reliability must-run analysis performed by APS and I agree that its analyses show that there are some 500-600 hours per year when generation in the Valley must be run in order to assure system reliability.[16] I also agree that APS could show that PWEC units West Phoenix Units 4 and 5 can fulfill this need from time-to-time. I do not agree that putting these plants into rate base is the only means of obtaining the indicated must-run services on a reliable basis or that it is the most economical means of assuring Valley reliability. In APS's January 31, 2003 Reliability Must-Run Analysis, the Company concluded that its system could be operated reliably as presently configured. The report indicates that although West Phoenix Units 4 and 5 can provide must-run services, there are other options available as well.[17] For example, the report examines the trade-off between improving transmission import capability into the region with using local generation

---

14 Bhatti Direct Testimony at Page 5:12-14.
15 Hieronymus Direct Testimony at Page 5:12 and Wheeler Direct Testimony at Page 13: 8-9.
16 Discovery Response LCA 3-90, RC00820 at page 6, attached as Exhibit JDT-3.
17 Id. at pages 9-10, attached as Exhibit JDT-3.

resources. APS notes that it will require from 365 MW in 2003 to 554 MW in 2005 of non-APS resources within the Phoenix area to serve APS's Phoenix-area load. APS estimates that it could relieve 452 MW of the Phoenix area's transmission constraint through the addition of a 600 MVAR static var compensator at an annualized cost associated with this investment of about $2.4 million.[18] Thus there are various low cost approaches for APS to assure Valley reliability upon expiration of the Track B Contracts. APS has not demonstrated that a reliability problem will exist in the Valley without certain of the PWEC assets in rate base.

Q: **IS THERE OTHER EVIDENCE THAT UNDERMINES THE PROPOSITION THAT APS'S OWNERSHIP OF WEST PHOENIX UNITS 4 AND 5 IS CRITICAL TO APS'S SYSTEM RELIABILITY?**

A: Yes, although it is clear that the Valley load pocket is subject to occasional periods where must-run operation of certain facilities is required, PWEC never assumed that the West Phoenix plants would be built to exclusively provide reliability must-run services. Actually, evidence indicates that PWEC fully expected to export power from these facilities for sale at Palo Verde. For example, a PWEC S&W Consultants' report[19] from February 12, 2001 indicates:

> "PWE[C] entered into two agreements with APS on March 15, 2000 for APS to provide firm transmission from both West Phoenix Unit 4 and West Phoenix Unit 5 to the Palo Verde 500 Kv switchyard. For West Phoenix Unit 4, APS is providing 125 MW of reserved capacity beginning August 1, 2001 and ending March 31, 2004. For West Phoenix 5, a reserved capacity of 525 MW will begin June 1, 2003 and end September 30, 2004."

18 Id. at pages10 and 44, attached as Exhibit JDT-3.

19 Workpaper APB_WP28 at page 12, attached as Exhibit JDT-3.

Moreover, in the 2003 Reliability Must Run Report, APS noted that because the actual number of out-of-merit dispatch hours is low in the Valley, generation reliance was the cheap, and preferred alternative, when compared to transmission upgrades.[20] The evidence indicates that these units were built with an intention to be able to provide energy at various points in the transmission system, not to just meet APS's occasional must-run requirements.

Q: **HAVE YOU CONSIDERED APS'S CONTENTION THAT ITS TRACK B SOLICITATION SHOWS THAT IT CANNOT OBTAIN NEW GENERATION RESOURCES IN THE VALLEY TO MEET ITS NEED FOR MUST-RUN SERVICES?**

A: Yes. I believe that APS's contention that it is unable to secure incremental megawatts in the Valley area is not based upon actual efforts to obtain these services.[21] For example, APS has not issued a Valley specific RFP. Nor have they taken into account low cost transmission solutions. The low number of must-run hours for the Valley is well-suited for economic supply by peaking units instead of the combined cycle PWEC assets that are more typically used to meet base load requirements. An RFP for Valley must-run services would allow the market to provide this service with peaking units that could be constructed prior to the end of the Track B Contracts.

Q: **WHAT ABOUT APS'S CLAIMS THAT THE PWEC ASSETS COULD PROVIDE OPERATIONAL FLEXIBILITY THAT CANNOT BE PROVIDED BY OTHER GENERATION FACILITIES?**

A: I do not disagree with APS's claims that it would dispatch and operate its system differently if it completely controlled the generation facilities that were built by PWEC, but I find that APS has not demonstrated that these operational benefits translate into secure, long-term savings for ratepayers.[22]

First, if the benefits of ownership and subsequent joint dispatch of these facilities with APS's existing generation facilities were significant in the near-term, APS would not need to ask for a rate increase to accommodate the addition of these plants to its fleet. As I have demonstrated above (and as Professor Kalt discusses in his testimony), the PWEC assets will be a financial drag on APS in the near years, and there is no guarantee that out year performance will produce significant benefits. APS is asking the Commission to conclude that APS's customers will benefit from rate basing the PWEC assets on the bet that speculative, long-term revenues associated with the PWEC assets will be able to significantly offset certain near year losses. The Commission should reject this attempt to shift the merchant generation risk that PWEC assumed when it built the PWEC assets to APS's customers.

Q: **HOW DO YOU RESPOND TO APS'S CLAIM THAT RATE BASING THE PWEC ASSETS OFFERS ECONOMIC ADVANTAGES TO ITS CUSTOMERS THAT**

---

20 Discovery Response LCA 3-90, RC00820 at pages 9-10 attached as Exhibit JDT-3.

21 Bhatti Direct Testimony at Pages 14-15 and Wheeler Direct Testimony at Pages14: 3-20.

22 Mr. Wheeler testifies that because Track B provides operational control of PWEC assets only during the months of June-September 2004-2006, that additional operational benefits would accrue if there were an unexpected outage of an APS generation facility. (Wheeler Direct Testimony at Page 16:13-21.) Presumably, APS targeted only the summer months for its procurement process because it recognized that there are ample resources available from its current generation resources and the wholesale market to cover its load during the fall/winter/spring months, including reserves to cover a plant outage.

WOULD OTHERWISE BE UNAVAILABLE FROM THE WHOLESALE MARKET?

A: I find APS's contention purely speculative. Because APS has not provided any evidence of the value of the PWEC assets in the market, APS cannot credibly claim that its proposal to rate base the PWEC assets at current book value offers APS's customers long-term benefits over the status quo. A market appraisal is a fundamental part of any generation purchase and sale, and presumably APS (and PWEC) have conducted market analyses of the value of the PWEC Assets. Indeed, the failure of APS to include a market appraisal of the PWEC assets in its direct case suggests either that it is acting imprudently with respect to this proposed transaction or that the results of such a market appraisal would not support APS's proposal to purchase the PWEC assets at book value. Instead of relying on a market valuation, APS points to savings based upon depreciation that has somewhat reduced the PWEC assets' original book value. But book value, whether original or current, has no direct relationship to market value, which is the only value by which the actual savings or costs of APS's rate basing proposal can appropriately be measured. Savings off the original book value of the PWEC assets are irrelevant to the relative economic benefits or disbenefits of APS's rate basing proposal.

Q: **HOW DOES APS SUPPORT ITS CLAIM THAT RATEBASING THE PWEC ASSETS PROVIDES ECONOMIC BENEFITS TO CUSTOMERS?**

A: APS witness Wheeler offers an analysis that claims that putting the PWEC assets into the rate base at 2004 book value of $896.1 million or $533/Kw produces almost $500 million of savings to ratepayers.[23] Mr. Wheeler first compares the $533/Kw value to various observed costs to construct other similar facilities, then finds that those realized costs on average are higher than $533/Kw and ultimately concludes that the difference between the book value and recently observed costs to construct facilities should be considered indicative of savings available to APS customers.

Q: **DO YOU FIND MR. WHEELER'S ANALYSIS PERSUASIVE?**

A: A: No. Mr. Wheeler's reliance on recently observed construction costs for combined cycle power plants cannot be considered suitable evidence to support his claims. His entire analysis assumes that it is appropriate for APS to add base-load combined cycle plants only, which are considerably more expensive to build than peaking plants, without any analysis to support a conclusion that the higher capital costs of PWEC's combined cycle plants are justified based on lower energy costs versus a peaking unit.

Moreover, there are a significant number of existing underutilized plants and partially completed plants in the Southwest whose output may be available for well less than the cost of new generation. Figure 3 of page 21 of Mr. Bhatti's testimony shows that the demand requirement in Arizona does not substantially exceed the current supply until 2009. In fact, in conjunction with its new RFP, Mr. Wheeler recently indicated to the Arizona Republic that APS is hoping to take advantage of a buyer's market for Arizona power plants. [24]

Q: **HAVE YOU REVIEWED APS'S SUMMARY RESPONSE TO ITS NEW RFP?**

---

[23] See Workpaper SMW_WP17, attached as Exhibit JDT-3. Note that the PWEC asset's book value shown in the workpaper is slightly higher than the amount ($889 million) shown in Schedule B-2 of the rate case filing.

[24] Arizona Republic Article, November 26, 2003, attached as Exhibit JDT-3.

A: Yes. The results clearly indicate that there are power plant owners in Arizona ready and able to offer long-term power supplies to APS. APS reports that 9 companies submitted 13 proposals offering approximately 6,800 MW.[25] These results call into question APS's claims that the wholesale market cannot be expected to meet its requirements (see Section III) and indicate that as opposed to ratebasing PWEC assets at book value, PWEC should be competing along with other suppliers in the market for the opportunity to enjoy the benefits of a long-term contract with APS.

Q: **WILL APS'S RECENT RFP FOR LONG TERM CAPACITY SERVE AS A REASONABLE BENCHMARK FOR RATEBASING THE PWEC ASSETS?**

A: No. Given the terms under which the December 3, 2003 RFP is being conducted, the results will not provide a reasonable benchmark. For example, the RFP includes a Draft Asset Purchase Agreement with a "Regulatory Out Clause" that shifts significant risk from APS's shareholders to all potential sellers.[26] APS has not imposed a similar condition on PWEC in the proposed rate-basing of PWEC assets. From my experience, this type of provision may either eliminate some potential bids or materially add to the price bid for the sale of the asset.[27] Indeed, as I discuss further below, the Independent Monitor in the Track B process concluded that APS's Regulatory Out provision for long term bids likely had a chilling effect on the receipt of such bids.

---

[25] APS' Summary of Responses Received to its Power Supply Request for Proposals Dated December 3, 2003, January 27, 2004.

[26] APS December 3, 2003 RFP, (Section 8.7, page 31), attached as Exhibit JDT-3.

[27] APS's summary of its RFP responses submitted on January 27, 2004 included an indication that no party who submitted a bid objected to this clause. However, this does not reveal whether parties failed to submit bids because of this provision or whether this provision affected the prices of the bids received.

Q: **PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING APS'S CLAIMS THAT PUTTING THE PWEC ASSETS INTO RATE BASE PROVIDES LONG TERM BENEFITS.**

A: I conclude that APS's claimed benefits are largely speculative and anecdotal. APS has not shown that it needs the PWEC assets to operate its system reliably and it has not offered any credible evidence that a transfer at book value provides reasonable value to its customers.

III APS SHOULD RELY ON THE WHOLESALE MARKET TO SUPPLY A PORTION OF ITS CUSTOMERS' NEEDS.

Q: **HAVE YOU EXAMINED APS'S CONTENTION THAT OVER THE LONGER TERM, THE COMPETITIVE MARKET CANNOT BE RELIED UPON TO ECONOMICALLY MEET APS'S NEEDS?**

A: Yes. APS witnesses state at several points throughout their testimony that the Western U.S. wholesale electricity market may be incapable of providing APS with reliable electricity supplies beyond 2006. To support its concerns about reliance on the wholesale market for longer term supply, APS relies chiefly upon the dearth of long term bids it received in its Track B solicitation. Mr. Wheeler, for example, states as follows:

> "[T]he results of the Commission's Track B solicitation . . . demonstrated that the competitive market is as of yet too immature . . . and cannot be

> relied upon to reasonably meet APS customers' needs at all times and under all market conditions."[28]

> "Offers of power for delivery after 2005 [in the Track B solicitation] were virtually non-existent [and] . . . underscore[s] the essential difference between a vertically-integrated utility's obligation and ability to plan for and provide for the resources needed to assure reliability and the market's concern for profit maximization."[29]

APS fails to note, however, that the Track B solicitation was expressly designed to cover APS supply needs through 2006, not beyond, and that APS proposed the inclusion of a "Regulatory Out" provision in all contract deliveries after 2005. The Independent Monitor specifically identified this as one reason why some bidders chose not to provide bids for power to be supplied after 2005.[30] Indeed, I believe that APS's inclusion of an onerous "Regulatory Out" clause was much more likely the limiting factor on long term bids into the Track B process than the reason suggested by Mr. Wheeler and Dr. Hieronymus, i.e., the expectation of high prices after 2005.[31] In that regard, my view is consistent with APS's stated explanation for the urgency in issuing its latest RFP – that there are several

---

28 Direct Testimony of Wheeler at Page 5: 14-18. APS witness Hieronymus makes similar statements in his testimony regarding the capability of the competitive wholesale generation market to meet the needs of APS's customers. According to Dr. Hieronymus:

> "Even in the Track B solicitation, long after the electricity crisis had waned, only quite modest and insufficient amounts of generation owned by others was made available for contracts to meet APS's load." Direct Testimony of Hieronymus at Page 8: 1-4.

29 Direct Testimony of Wheeler at Page 14: 3-10.

30 Independent Monitor's Final Report on Track B Solicitation, Accion Group, May 27, 2003 at pages 45-46, attached as Exhibit JDT-3.

31 Direct Testimony of Hieronymus at page 50: 9-11 where he states: "The absence of long-term offers [in the Track B solicitation] suggests that potential sellers view the post-2005 market with greater optimism than is reflected in current forward markets."

merchant plant owners that may be interested in selling Arizona power plants or in entering long term power sales agreements.[32] As I describe below, based upon my examination of various aspects of the competitive wholesale western U.S. electricity markets, I conclude that it is reasonable for APS to rely on the competitive market for a portion of its longer term needs.

Q: **HAVE YOU RESEARCHED THE RESULTS OF RECENT REQUEST FOR PROPOSAL SOLICITATIONS FOR ELECTRICITY SUPPLIES IN THE WESTERN U.S.?**

A: Yes. Exhibit JDT-8 shows a listing of several RFPs that have been conducted in the Western U.S. over the past couple years. As the Exhibit shows, there have been numerous RFPs issued recently in the West (especially following the shortage experienced by California in 2000-01). These solicitations have requested a variety of short-term and long-term energy and capacity products. Although the outcomes of these RFPs vary considerably, there is no evidence that the market has been unresponsive. This includes the Track B solicitation. Although APS now claims that this solicitation was poorly subscribed, the Independent Monitor's report concluded otherwise:

> "Successful outcome. APS received more than 175 bids from 10 bidders and TEP evaluated 26 bids from 5 bidders. Based upon the number of bids received, we believe that the process produced competitive prices for the products purchased."[33]

---

32 Response of APS in Opposition to Motion of Arizona Competitive Power Alliance, p. 5, lines 6–8. APS also recognized in its internal report on Market Structure Scenarios that there is inadequate transmission to California for all of this Arizona merchant generation to seek markets outside of Arizona. See Bhatti Workpaper 30, Pages 11 and 17, attached as Exhibit JDT-3.

33 Independent Monitor's Final Report on Track B Solicitation, Accion Group, May 27, 2003 at page 4, attached as Exhibit JDT-3.

This successful outcome was achieved despite the existence of the "Regulatory Out" clause and other provisions that the Independent Monitor concluded may have reduced the number of the bids and the time period covered by the bids.[34]

Q: **HAS THE WESTERN WHOLESALE ELECTRICITY MARKET BROUGHT FORTH NEW CAPACITY ADDITIONS IN RECENT YEARS?**

A: Yes. Exhibit JDT-9 shows that the market has placed in service approximately 32,000 MW of new capacity in recent years, and this level is expected to increase to a total of nearly 37,000 MW by the end of 2005. In particular, some 10,000 MW of new capacity will have been added in Arizona alone. This represents 15 plants of which more than 9,000 MW are already in service.[35] These new facilities represent a significant amount of new capacity in the region competing to sell electricity for delivery now and in the future.

Q: **WHAT ARE YOUR CONCLUSIONS REGARDING APS'S CONTENTION THAT THE COMPETITIVE WHOLESALE ELECTRICITY MARKET WILL BE INCAPABLE OF SUPPLYING APS POWER POST 2006?**

A: I find that APS has not offered any evidence that the wholesale market will be incapable of meeting APS's future needs. Although it is quite likely that the PWEC assets will play a role in providing APS capacity and energy post 2006, there is no reason to believe that other generating units will not also be available to meet APS demand. Just because APS

---

[34] Id. at pages 45-47, attached as Exhibit JDT-3.

[35] Those plants already in-service are: Arlington Valley I, 570 MW; Desert Basin Generating, 500 MW; Gila River I-IV, 2,080 MW; Griffith Energy, 600; Harquahala Generating Station, 1,092 MW; Kyrene, 250 MW; Mesquite Power 1-2, 1000 MW; Red Hawk 1-2, 1,060 MW; Saguaro, 80 MW; South Point, 550 MW; Sundance Energy Project 1, 450 MW; West Phoenix 4-5, 650 MW; and, Tucson CTs, 96 MW.

may not be able to point to a particular asset at this juncture to meet its forecasted needs does not mean that the market is not working. As I described above, APS is largely assuming that as a result of the specific results of the 2004-2006 Track B RFP, the market cannot fulfill its future needs. Prior to seeking to ratebase the PWEC assets, however, APS had not gone to the market and requested longer-term resources. The inclusion of an onerous "Regulatory Out" clause in APS's recent RFP calls into question whether this will be a reasonable test of the market or is simply window-dressing for APS's ratebasing strategy. Evidence from western markets seriously undermines APS's suggestion that the Commission should change its current power procurement policies. Finally, APS's approach has attributes of a self-fulfilling prophecy. To the extent that APS fails to seriously consider third-party purchases and unreasonably favors its affiliate, a competitive market will be less likely to develop.

Q: **DO YOU CONCLUDE THAT THE COMMISSION POLICY OF HAVING APS RELY IN PART ON THE WHOLESALE MARKET IS STILL GOOD POLICY AND DICTATES REJECTION OF APS'S RATE BASING PROPOSAL?**

A: Yes. The Commission's policy of encouraging a robust wholesale electricity market remains an important goal for Arizona retail customers. Abrogating the Track B Contracts and rate basing the PWEC assets rather than APS relying on the market to supply this load runs counter to the Commission's policy objectives and is not in the long-term interest of APS customers. I believe the Commission's policy of requiring generation portfolio diversity through some continuing reliance on the competitive markets is measured and sensible—indeed the policy is so difficult to assail that APS itself appears to support it in the policy testimony of Mr. Wheeler:

> "APS understands that the wholesale market is not just some place where utilities dump their unneeded energy or take advantage of each other's relative economies of generation. It is a viable and necessary resource that can and should be incorporated into a broad-based portfolio of resources used to serve customer needs. This is why APS supports a vibrant and robust wholesale market and why it has taken significant steps to encourage that market."[36]

The best way for APS to support a vibrant and robust wholesale market is to honor rather than abrogate the Track B Contracts and meet its post 2006 resource needs through fair and transparent competitive solicitations, rather than by rate basing the PWEC assets. To the extent that APS has concerns about the credit capacity of potential sellers under contracts, market contract purchases can be used for the short term and medium term portions of a diverse portfolio. The inconsistency between APS's rate basing proposal and the development of a vibrant and robust wholesale market is stark. The continued support of the latter goal requires rejection of APS's rate basing proposal.

Q: **DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

A: Yes.

---

[36] Wheeler Direct Testimony at Page 32: 13-19.

Exhibit JDT-1
JEFFREY D. TRANEN

Lexecon Inc.
145 East 76th St., 5B
New York, NY 10021-2843
(212) 249-6569 (direct)
(800) 224-9744 (main)
(212) 249-6154 (fax)

PROFESSIONAL EXPERIENCE

Lexecon Inc., New York, NY
Senior Viee President, 2000 - present

Leads Lexecon's business strategy consulting for the electricity industry with a focus on the significant challenges associated with industry restructuring. Provided testimony in a number of proceedings related to potential refunds from the California electricity markets. Developed and successfully implemented a strategy for an electric utility in PJM to mitigate its risks associated with wholesale power procurement for its default service customers. Played a leadership role in the development of the filing for an RTO in New England, including the negotiations between the transmission owners, ISO New England, and other stakeholders. Provided strategic advice to an electricity marketer in New England on the evolution of market rules in that region.

Sithe Energies, Inc., New York, NY
President and Chief Operating Officer, Sithe Northeast, 1999 - 2000

Led the effort to close on the acquisition of generating assets to more than double the size of Sithe Northeast to 8,000 megawatts. Initiated and led the transformation of the Sithe generating assets and organization in the Northeast into an integrated competitive generation and trading company. Created the management team and put the information system infrastructure in place. Established Sithe Northeast's market structure strategy to work with the Independent System Operators to promote rapid evolution of the Northeast markets to greater efficiency.

California Independent System Operator, Folsom, CA
President and Chief Executive Officer, 1997 - 1999

Led the effort to successfully start up the California Independent System Operator to provide reliable, efficient transmission and market operation and enable retail choice throughout eighty percent of California. Guided the evolution of the markets during the first year of operation. Identified market design flaws, built consensus for solutions among highly diverse constituencies, gained regulatory approvals, and implemented the new design.

New England Electric System, Westborough, MA
1970 - 1997

New England Electric System
Senior Vice President, 1996 - 1997

As Chairman of the NEPOOL Management Committee, led the most significant reform in the structure of the New England Power Pool, preparing it for deregulation and retail competition. Key member of senior management team that developed the strategy and negotiated agreements that are shaping deregulation in the Northeast and resolved $4.5 billion in potentially strandable investments.

New England Power Company
President, 1993 - 1997

Led a wholesale generation and transmission company with gross revenue of approximately $1.5 billion and an all-requirements load of over 4,000 megawatts. Achieved a Return on Equity consistently in the 16-17% range through aggressive cost control and effective regulatory activities. Completed 500 megawatts repowering project ahead of schedule and over $150 million under budget.

New England Electric System
Vice President, 1991 - 1996
New England Electric Transmission Company, New England Hydro Transmission Corporation, New England Hydro Electric Transmission Company, Inc., New England Hydro Finance Company, Inc.
President and Director, 1991 - 1996

Led the development of NEESPlan4, NEES's corporate resource plan that fully integrated environmental, economic, and reliability objectives. Played a major role in restructuring the New England Electric System into business units. Chosen to lead Wholesale Business Unit when created in 1993. Led the effort to restructure the entire information system at NEES. Developed contracts with all system users to justify the expenditures based on projected benefits.

New England Electric Transmission Company, New England Hydro Transmission Corporation, New England Hydro Electric Transmission Company, Inc., New England Hydro Finance Company, Inc.
Vice President, 1987 - 1991

Led the licensing and construction of the $500 million Hydro-Quebec/New England HVDC Transmission Interconnection Project as managing agent for a consortium of New England utilities. The project was completed $80 million under budget.

New England Power Company
Vice President, 1984 - 1991
Yankee Atomic Electric Company, Connecticut Yankee Atomic Electric Company, Maine Yankee Atomic Electric Company, Vermont Yankee Atomic Electric Company
Director, 1984 - 1991

Chaired audit and compensation committees on the four nuclear Boards of Directors. Led New England Electric's efforts as a partner in Ocean State Power, the first major gas fired independent power project in New England. Led the negotiations for purchases of power from independent power projects.

Various Engineering and Management Positions, 1970 - 1984

Led major components of a recovery team to restore New England Power Company's largest, most efficient generator to service after a catastrophic turbine failure.

Managed New England Electric's relationship with the New England Power Pool and served on the NEPOOL Operating Committee.

Managed distribution line crews, customer service, metering, and field engineering functions.

Acted as a liaison with all functions reporting to Senior Vice President, including generation operations, fuel, engineering, and environmental.

Played a major role in designing and implementing a new automated billing and settlement system for NEPOOL and restructuring the controls at NEES to ensure accurate billings among the NEPOOL participants.

Performed numerous studies recommending transmission additions and modifications to the New England transmission grid. Served on NEPOOL transmission task force.

Performed increasingly responsible studies to select and set protective relay equipment on the transmission system and for major new generation plants.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
S.B., Electrical Engineering, 1968
S.M., Electrical Engineering, 1969
Electrical Engineer, 1970

Harvard Business School, Cambridge, MA
Advanced Management Program, 1990

TESTIMONY AND REPORTS

Idaho Power Company

Lexecon Audit of Idaho Power Company Compliance with its Standard of Conduct, December 8, 2003.

Coral Power, LLC

United States of America, Before the Federal Energy Regulatory Commission, Coral Power, LLC. Written testimony in response to order to show cause, November 3, 2003; affidavit in support of settlement, November 14, 2003; declaration, December 15, 2003.

Dynegy Inc.; Duke Energy Services LLC; Mirant Americas, Inc.; Williams Energy Marketing and Trading Co.

United States of America, Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services into Markets Operated by the California Independent System Operator and the California Power Exchange; Investigation of Practices of the California Independent System Operator and the California Power Exchange. Affidavit (with P. Wang), May 12, 2003.

Reliant Energy

United States of America, Before the Federal Energy Regulatory Commission, Fact-Finding Investigation into Possible Manipulation of Electric and Natural Gas Prices. Affidavit attached to Reliant response, April 11, 2003.

Duke Energy Trading and Marketing LLC

United States of America, Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services into Markets Operated by the California Independent System Operator and the California Power Exchange; Investigation of Practices of the California Independent System Operator and the California Power Exchange. Prepared direct and rebuttal testimony, March 20, 2003.

Dynegy Inc.; Duke Energy Services LLC; Mirant Americas, Inc.; Reliant Energy; Williams Energy Marketing and Trading Co.

United States of America, Before the Federal Energy Regulatory Commission, San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services into Markets Operated by the California Independent System Operator and the California Power Exchange; Investigation of Practices of the California Independent System Operator and the California Power Exchange. Prepared direct and answering testimony for five California generators in a suit claiming refunds from them for sale of energy into California markets; Issue 1 direct and answering testimony, November 6, 2001; Issue 1 deposition, December 3, 2001; Issue 1 supplemental direct and answering testimony, January 31, 2002; Issue 1 rebuttal testimony, February 25, 2002; Issue 1 oral testimony, March 14-15, 2002; Issue 1 affidavit, June 14, 2002; Issues 2/3 direct and answering testimony, July 3, 2002; Issues 2/3 supplemental testimony, July 26, 2002; Issues 2/3 rebuttal testimony, July 26, 2002; Issues 2/3 surrebuttal testimony, August 9, 2002; Issues 2/3 deposition, August 16, 2002; Issues 2/3 oral testimony, August 23, 2002.

TransCanada Power Marketing Ltd.

In the Matter of the Arbitration Between Transcanada Power Marketing, Ltd. and ISO-New England, Inc., Case #71 198 000 4101 of the American Arbitration Association. Expert report in arbitration between TransCanada Power Marketing Ltd. and ISO-NE regarding implementation of the ISO-NE tariff, September 19, 2001.

ARTICLES AND PUBLICATIONS

"Shining Light on the Blackout" (with Janet Gail Besser), *The Energy Daily,* September 24, 2003.

OTHER PROFESSIONAL ACTIVITIES

Member, Oglethorpe Power Corporation Board of Directors, 2000 - present

Member, Doble Engineering Company Board of Directors, 1998 - present

Member, Harvard Electricity Policy Group, 1990 - present

Member, EarthFirst Technologies, Inc., Board of Directors, 2001-2002

PAST AFFILIATIONS

Chairman, NEPOOL Management Committee

Member, Executive Committee, Northeast Power Coordinating Council

Member, Research Advisory Council, Electric Power Research Institute

Member, State of Massachusetts Board of Environmental Management

Member, Corporate Support Committee, Joslin Diabetic Center

Member, Board of Overseers, Boston Museum of Science

Exhibit JDT-2
FINANCIAL IMPACT OF RATEBASING PWEC ASSETS ON APS'S ADJUSTED TEST YEAR REVENUE REQUIREMENT

Categories of Revenue Requirement Costs	Revenue Requirement w/o PWEC	Sources	Revenue Requirement w/ PWEC	Sources	Revenue Requirement Impact of PWEC Assets	Sources
Return on Rate Base	$ 475,524,985	(Calculated)	$ 602,958,365	(Calculated: 8.67% x $4,207,475,999 x 1.6529; sources: Sch. A-1, lines 5 & 7; Sch. B-2, p. 1, line 6)	$ 127,433,380	(Calculated: 8.67% x $889,237,000 x 1.6529; sources: Sch. A-1, lines 5 & 7; Sch. B-2, p. 1, line 6)
Revenue Requirement Reduction from Change in Capital Structure (Includes Reduced Cost of Capital and Lower Income Taxes)	-	-	-	-	$ (40,315,333)	(Calculated: $4,207,475,999 x (8.67% - 8.31%) x 1.6529 + 15,279,000; sources: Sch. C-2, p. 3, line 15; Direct Testimony of Donald G. Robinson at 29, line 20)
Fuel and Purchased Power for Own Load	$ 594,849,000	(Calculated)	$ 559,879,000	(Sch. C-1, p. 2, line 2)	$ (34,970,000)	(Sch. C-2, p 3, line 2)
Depreciation and Amortization	$ 288,514,000	(Calculated)	$ 329,983,000	(Sch. C-1, p. 2, line 6)	$ 41,469,000	(Sch. C-2, p. 3, line 7)
Operations & Maintenance (Including A&G)	$ 548,815,000	(Calculated)	$ 590,073,000	(Sch. C-1, p. 2, line 5)	$ 41,258,000	(Sch. C-2, page 3, line 4, 5, 9)
Other Taxes	$ 99,013,000	(Calculated)	$ 110,197,000	(Sch. C-1, p. 2, line 8)	$ 11,184,000	(Sch. C-2, p. 3, line 10)
Off-System Sales Margin	$ (14,749,000)	(DGR-WP13 p.3)	$ (46,411,000)	(DGR-WP14 p. 7)	$ (31,662,000)	(Calculated)
Test Year Revenue Requirement Impact from PWEC Roll-In					$ 114,397,046	

Note: Pages 2-10 of this Exhibit contain various source documents referenced above.

ARIZONA PUBLIC SERVICE COMPANY
Computation of Increase in Gross Revenue Requirements
ACC Jurisdictional
Adjusted Test Year Ended 12/31/2002
(Dollars in Thousands)

Line No.	Description	Electric: Original Cost	Electric: RCND	Electric: Fair Value	Line No.
1.	Adjusted Rate Base	$ 4,207,476 (a)	$ 6,727,455 (a)	5,467,466	1.
2.	Adjusted Operating Income	263,870 (b)	263,870 (b)	263,870	2.
3.	Current Rate of Return	6.27%	3.92%	4.83%	3.
4.	Required Operating Income	364,788	364,788	364,788	4.
5.	Required Rate of Return	8.67%	5.42%	6.67%	5.
6.	Operating Income Deficiency	100,918	100,918	100,918	6.
7.	Gross Revenue Conversion Factor	1.6529 (c)	1.6529 (c)	1.6529 (c)	7.
8.	Increase in Base Revenue Requirements	$ 166,807	$ 166,807	$ 166,807	8.
9.	CRCC Surcharge (d)	8,283	8,283	8,283	9.
10.	Total Increase in Revenue Requirements	$ 175,090	$ 175,090	$ 175,090	10.

Line No.	Customer Classification	Projected Revenue Increase Due to Rates	% Increase	Line No.
11.	Residential	86,586	9.73%	11.
12.	General Service	86,758	9.82%	12.
13.	Irrigation	207	9.86%	13.
14.	Outdoor Lighting	1,041	9.64%	14.
15.	Dusk-to-Dawn	498	9.58%	15.
16.	Total	$ 175,090	9.77%	16.
17.	Total Sales to Ultimate Retail Customers	$ 1,791,584 (d)		17.

Supporting Schedules
(a) B-1 (c) C-3
(b) C-1, page 2 (d) H-1

ARIZONA PUBLIC SERVICE COMPANY
Original Cost Rate Base
Pro Forma Adjustments
(Dollars in Thousands)

		(1)		(2)		(3)	
		Actual at End of Test Year 12/31/2002 (a)		PWEC Units		Remove Regulatory Assets Amortized under Prior Settlement	
Line No.	Description	Total Co. (A)	ACC (B)	Total Co. (C)	ACC (D)	Total Co. (E)	ACC (F)
1.	Gross Utility Plant in Service	$ 8,486,874	$ 8,203,305	$ 1,021,886	$ 1,015,393	$ -	$ -
2.	Less: Accumulated Depreciation & Amort.	3,542,547	3,405,509	73,395	73,045	-	-
3.	Net Utility Plant in Service	4,944,327	4,797,796	948,491	942,348	-	-
4.	Less: Total Deductions (Deferred Taxes)	1,614,838	1,589,887	53,382	53,111	(41,080)	(41,080)
5.	Total Additions (Regulatory Assets)	563,800	556,554	-	-	(104,000)	(104,000)
6.	Total Rate Base	$ 3,893,289	$ 3,764,463	$ 895,109	$ 889,237	$ (62,920)	$ (62,920)

(2) Adjustment to Test Year rate base to include the Pinnacle West Energy Units including West Phoenix Combined Cycle Unit No. 4, West Phoenix Combined Cycle No. 5, Redhawk Combined Cycle No. 1, Redhawk Combined Cycle No. 2 and Saguaro Combustion Turbine No. 3.

(3) Adjustment to Test Year rate base to exclude certain net regulatory assets which, pursuant to the terms of the 1999 Settlement Agreement, will be fully amortized by June 30, 2004.

Supporting Schedules:
(a) E-1

ARIZONA PUBLIC SERVICE COMPANY
Original Cost Rate Base
Pro Forma Adjustments
(Dollars in Thousands)

Line No.	Description	(7) Total Original Cost Rate Base Pro Forma Adjustments (b)		(8) Adjusted at End of Test Year 12/31/2002 (b)		Line No.
		Total Co. (M)	ACC (N)	Total Co. (O)	ACC (P)	
1.	Gross Utility Plant in Service	$ (242,704)	$ 13,895	$ 8,244,170	$ 8,217,200	1.
2.	Less: Accumulated Depreciation & Amort.	(426,560)	(307,558)	3,115,987	3,097,951	2.
3.	Net Utility Plant in Service	183,856	321,453	5,128,183	5,119,249	3.
4.	Less: Total Deductions (Deferred Taxes)	(9,553)	12,698	1,605,285	1,602,585	4.
5.	Total Additions (Regulatory Assets)	134,321	134,258	698,121	690,812	5.
6.	Total Rate Base	$ 327,730	$ 443,013	$ 4,221,019	$ 4,207,476	6.

Recap Schedules:
(b) B-1

ARIZONA PUBLIC SERVICE COMPANY
ACC Jurisdiction
Adjusted Test Year Statement of Income
Test Year 12 Months Ended 12/31/02

Schedule C-1
Page 2 of 2

(Dollars in Thousands)

Line No.	Description	ACC Jurisdiction: Actual For The Test Year Ended 12/31/02	Proforma Adjustments (a)	Test Year Results After Proforma Adjustments (b)	Line No.
1.	Electric Operating Revenues	$ 2,051,730	$ (111,584)	$ 1,940,146	1.
2.	Purchased power and fuel costs	616,873	(56,994)	559,879	2.
3.	Operating revenues less purchased power and fuel cost	1,434,857	(54,590)	1,380,267	3.
4.	Other Operating Expenses:				4.
5.	Operations and maintenance	489,041	101,032	590,073	5.
6.	Depreciation and amortization	393,035	(63,052)	329,983	6.
7.	Income taxes	129,307	(43,163)	86,144	7.
8.	Other taxes	104,205	5,992	110,197	8.
9.	Total	1,115,588	809	1,116,397	9.
10.	Operating Income	$ 319,269	$ (55,399)	$ 263,870	10.

Supporting Schedules:
(a) C-2

Recap Schedules:
(b) A-1

ARIZONA PUBLIC SERVICE COMPANY
Income Statement Pro Forma Adjustments
Test Year Twelve Months Ended 12/31/2002
(Thousands of Dollars)

			(7)		(8)		(9)	
			Base Fuel and Purchased Power		Normalize Off-System Sales		PWEC Units	
Line No.	Description		Total Co. (M)	ACC (N)	Total Co. (O)	ACC (P)	Total Co. (Q)	ACC (R)
1.	Electric Operating Revenues		$ -	$ -	$ (128,200)	$ (126,332)	$ 56,779	$ 56,237
2.	Purchased Power and Fuel Costs		120,584	120,584	(151,868)	(149,655)	(34,970)	(34,970)
3.	Oper Rev Less Purch Pwr & Fuel Costs		(120,584)	(120,584)	23,668	23,323	91,749	91,207
	Other Operating Expenses:							
4.	Operations Excluding Fuel Expense		-	-	-	-	14,110	14,086
5.	Maintenance		-	-	-	-	18,549	18,390
6.	Subtotal		-	-	-	-	32,659	32,476
7.	Depreciation and Amortization		-	-	-	-	41,541	41,469
8.	Amortization of Gain		-	-	-	-	-	-
9.	Administrative and General		-	-	-	-	8,797	8,782
10.	Other Taxes		-	-	-	-	11,256	11,184
11.	Total		-	-	-	-	94,253	93,911
12.	Operating Income Before Income Tax		(120,584)	(120,584)	23,668	23,323	(2,504)	(2,704)
13.	Interest Expense		-	-	-	-	36,179	35,977
14.	Taxable Income		(120,584)	(120,584)	23,668	23,323	(38,683)	(38,681)
15.	Current Income Tax Rate -	39.5%	(47,631)	(47,631)	9,349	9,213	(15,280)	(15,279)
16.	Operating Income (line 12 - line 15)		$ (72,953)	$ (72,953)	$ 14,319	$ 14,110	$ 12,776	$ 12,575

(7) Adjustment to Test Year operations to include 2003 base fuel and purchased power cents/kWh costs at adjusted 2002 consumption.

(8) Adjustment to Test Year operations to include off-system revenues consistent with the Base Fuel and Purchased Power pro forma adjustment.

(9) Adjustment to Test Year operations to include the Pinnacle West Energy Units including West Phoenix Combined Cycle No. 4, West Phoenix Combined Cycle No. 5, Redhawk Combined Cycle No. 1, Redhawk Combined Cycle No. 2 and Saguaro Combustion Turbine No. 3.

DIRECT TESTIMONY OF DONALD G. ROBINSON

On Behalf of Arizona Public Service Company

Docket No. E-01345A-

June 27, 2003

Component six, administrative and general expenses ("A&G"), includes 2003 budgeted A&G expenses at each of the PWEC Units. Included in many of the components discussed are allocated costs from the APS and Pinnacle West shared services organizations.

Component seven, property taxes for the PWEC Units, were forecasted for 2005 based on anticipated December 31, 2003 plant in service balances and the current valuation factor, assessment rate and property tax rates.

Q. HAVE YOU INCLUDED IN THE PRO FORMA ADJUSTMENT THE BENEFIT TO CUSTOMERS OF A REDUCED WEIGHTED COST OF DEBT AND A CHANGE IN THE COMPANY'S CAPITAL STRUCTURE?

A. Yes. I have included in the Electric Operating Revenue line the benefit to customers of including the PWEC Units related debt as part of the Company's permanent capital structure. As part of APS' acquisition of the PWEC Units, the debt owed by PWEC to APS will be cancelled and the loans obtained by APS in May 2003 will be treated as utility debt for ratemaking purposes. The impact of including this $500 million debt lowers the Company's overall long-term weighted cost of debt from 5.8% to 5.7% and changes the percentage of debt in the capital structure from approximately 50% to 55%. This lowers the overall cost of capital from 8.67% to 8.31%. The change in the rate of return has been applied to the Test Year and pro forma adjustment rate base amounts with the resulting savings included in the PWEC Units pro forma adjustments.

The general income tax benefit associated with the additional tax deductions for interest associated with the $500 million debt issuance in our capital structure also has been reflected in the pro forma. The final component, the income tax calculation, includes this benefit and also includes a specific additional

APS FUEL AND PURC' ED POWER PROFORMA
BASED ON 4/24/03 MARKET AN ACCEPTED TRACK B CONTRACTS
PWE UNITS NOT RATE BASED
2003 RATE CASE FILING
Gas Price Reduced 10%

	FOR THE YEAR 2003												
REVENUE ($000)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
OFF SYSTEM SALES													
APS Gen Off System Rev	2,391	1,395	835	170	1,444	2,757	745	774	641	959	2,969	2,251	17,332
APS T&C	416	456	1,316	31	1,936	3,884	3,323	3,115	2,010	1,305	1,341	788	19,921
APS Hedge Liquidation	2,081	1,292	1,519	510	1,839	955	492	459	581	1,820	2,108	1,953	15,609
PWE Gen	-	-	-	-	-	4,989	1,983	1,118	2,127	-	-	-	10,217
Sundance	-	-	-	-	-	-	-	1	-	-	-	-	1
Off System Additional Revenue Target	-	-	-	-	-	-	-	-	-	-	-	-	-
PWE Purchase	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	4,888	3,144	3,670	712	5,220	12,585	6,544	5,467	5,358	4,083	6,417	4,991	$\boxed{63,079}$
OFF SYSTEM MARGIN ($000)	493	416	514	(79)	1,337	3,968	2,314	1,651	1,203	684	1,672	575	14,749
Pacificorp Supplemental Revenue ($000)	2,567	2,138	2,107	2,125	1,495	1,855	843	856	1,518	1,115	1,758	1,942	20,319

DGR_WP13 3/4

APS FUEL AND PURCH.) POWER PROFORMA
BASEI] 4/24/03
MARKET AND ACCEPTED TRACK B CONTRACTS
W/ PWE UNITS RATE BASED
2003 RATE CASE FILING
Gas Price Reduced 10%

FOR THE YEAR 2003

REVENUE ($000)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
OFF SYSTEM SALES													
APS Gen Off System Rev	2,740	2,095	2,033	337	2,485	2,961	1,128	1,084	656	1,699	3,550	3,504	24,272
APS T&C	1,123	1,022	1,491	1,809	2,670	3,990	3,472	3,068	1,911	2,163	1,614	1,748	26,082
APS Hedge Liquidation	5,019	4,213	4,489	3,486	5,708	1,070	569	567	530	8,634	4,166	5,397	43,848
PWE Gen	10,407	8,503	5,307	1,467	2,340	3,584	2,124	952	2,237	7,723	12,206	13,405	70,256
Sundance	-	-	-	-	-	-	0	2	2	-	-	-	5
Off System Additional Revenue Target	-	-	-	-	-	-	-	-	-	-	-	-	-
PWE Purchase	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	19,289	15,833	13,319	7,099	13,202	11,605	7,295	5,674	5,336	20,219	21,537	24,054	164,463
OFF SYSTEM MARGIN [$000]	4,989	4,392	3,342	711	3,734	3,308	2,655	1,777	1,291	5,475	7,406	7,331	46,411
Pacificorp Supplemental Revenue ($000)	2,567	2,138	2,107	2,125	1,495	1,855	843	856	1,518	1,115	1,758	1,942	20,319

1.B.1

DGR - wp14 7/21

Exhibit JDT-3
APS WITNESS WORKPAPERS, DISCOVERY RESPONSES, AND OTHER RELEVANT DOCUMENTS CITED IN TRANEN TESTIMONY

ARIZONA PUBLIC SERVICE COMPANY
Original Cost Rate Base
Pro Forma Adjustments
(Dollars in Thousands)

Line No.	Description	(1) Actual at End of Test Year 12/31/2002 (a) Total Co. (A)	ACC (B)	(2) PWEC Units Total Co. (C)	ACC (D)	(3) Remove Regulatory Assets Amortized under Prior Settlement Total Co. (E)	ACC (F)
1.	Gross Utility Plant in Service	$ 8,486,874	$ 8,203,305	$ 1,021,886	$ 1,015,393	$ -	$ -
2.	Less: Accumulated Depreciation & Amort.	3,542,547	3,405,509	73,395	73,045	-	-
3.	Net Utility Plant in Service	4,944,327	4,797,796	948,491	942,348	-	-
4.	Less: Total Deductions (Deferred Taxes)	1,614,838	1,589,887	53,382	53,111	(41,080)	(41,080)
5.	Total Additions (Regulatory Assets)	563,800	556,554	-	-	(104,000)	(104,000)
6.	Total Rate Base	$ 3,893,289	$ 3,764,463	$ 895,109	$ 889,237	$ (62,920)	$ (62,920)

(2) Adjustment to Test Year rate base to include the Pinnacle West Energy Units including West Phoenix Combined Cycle Unit No. 4, West Phoenix Combined Cycle No. 5, Redhawk Combined Cycle No. 1, Redhawk Combined Cycle No. 2 and Saguaro Combustion Turbine No. 3.

(3) Adjustment to Test Year rate base to exclude certain net regulatory assets which, pursuant to the terms of the 1999 Settlement Agreement, will be fully amortized by June 30, 2004.

Supporting Schedules:
(a) E-1

ARIZONA PUBLIC SERVICE COMPANY
Original Cost Rate Base
Pro Forma Adjustments
(Dollars in Thousands)

Line No.	Description	(4) Independent Spent Fuel Storage Installation ("ISFSI") Total Co. (G)	ACC (H)	(5) Reversal of Settlement Write-Off Total Co. (I)	ACC (J)	(6) Transmission Assets Total Co. (K)	ACC (L)
1.	Gross Utility Plant in Service	$ -	$ -	$ -	$ -	$ (1,264,590)	$ (1,001,498)
2.	Less: Accumulated Depreciation & Amort.	-	-	-	-	(499,955)	(380,603)
3.	Net Utility Plant in Service	-	-	-	-	(764,635)	(620,895)
4.	Less: Total Deductions (Deferred Taxes)	1,707	1,682	92,430	92,430	(115,992)	(93,445)
5.	Total Additions (Regulatory Assets)	4,321	4,258	234,000	234,000	-	-
6.	Total Rate Base	$ 2,614	$ 2,576	$ 141,570	$ 141,570	$ (648,643)	$ (527,450)

(4) Adjustment to Test Year rate base to include the amount of System Benefits related ISFSI costs anticipated to be accrued between the end of the Test Year and June 30, 2004.

(5) Adjustment to Test Year rate base to restore the pre-tax $234 million deduction taken by the Company in consideration of benefits previously agreed to under the 1999 Settlement.

(6) Adjustment to Test Year rate base to remove transmission assets and generation plant functionalized to ancillary services consistent with FERC rules requiring APS to take transmission service and related ancillary services for the APS Standard Offer customers under the APS OATT.

ARIZONA PUBLIC SERVICE COMPANY
Original Cost Rate Base
Pro Forma Adjustments
(Dollars in Thousands)

Line No.	Description	(7) Total Original Cost Rate Base Pro Forma Adjustments (b) Total Co. (M)	(7) ACC (N)	(8) Adjusted at End of Test Year 12/31/2002 (b) Total Co. (O)	(8) ACC (P)	Line No.
1.	Gross Utility Plant in Service	$ (242,704)	$ 13,895	$ 8,244,170	$ 8,217,200	1.
2.	Less: Accumulated Depreciation & Amort.	(426,560)	(307,558)	3,115,987	3,097,951	2.
3.	Net Utility Plant in Service	183,856	321,453	5,128,183	5,119,249	3.
4.	Less: Total Deductions (Deferred Taxes)	(9,553)	12,698	1,605,285	1,602,585	4.
5.	Total Additions (Regulatory Assets)	134,321	134,258	698,121	690,812	5.
6.	Total Rate Base	$ 327,730	$ 443,013	$ 4,221,019	$ 4,207,476	6.

Recap Schedules:
(b) B-1

ARIZONA PUBLIC SERVICE COMPANY

HISTORIC PEAK LOAD, SYSTEM ENERGY and LOAD FACTOR

YEAR		PEAK LOAD (Mw)	PEAK LOAD Growth %	SYSTEM ENERGY (Gwh)	SYSTEM ENERGY Growth %	LF Percent	Residential Customer Use KWH/ Cust	Residential Customer Use Growth %
1949	E	152	8.4%	766	8.4%	57.7	1,746	
1950	E	168	10.8%	849	10.8%	57.7	1,887	8.1%
1951	E	199	18.6%	1,008	18.6%	57.7	2,049	8.6%
1952	E	238	19.4%	1,203	19.4%	57.7	2,262	10.4%
1953	E	271	13.9%	1,371	13.9%	57.7	2,370	4.8%
1954	E	291	7.3%	1,471	7.3%	57.7	2,570	8.4%
1955	E	319	9.6%	1,613	9.6%	57.7	2,682	4.4%
1956	E	395	23.9%	1,998	23.9%	57.7	2,962	10.4%
1957	E	446	13.0%	2,257	13.0%	57.7	3,173	7.1%
1958	E	523	17.3%	2,650	17.4%	57.8	3,562	12.3%
1959	E	575	9.9%	2,786	5.1%	55.3	3,664	2.9%
Compound Growth			6.4%		5.8%			7.7%
1960	A	651	13.3%	3,290	18.1%	57.5	3,958	8.0%
1961	A	681	4.6%	3,407	3.5%	57.1	4,004	1.2%
1962	A	728	6.9%	3,654	7.3%	57.3	4,228	5.6%
1963	A	777	6.7%	3,859	5.6%	56.7	4,536	7.3%
1964	A	815	4.9%	4,191	8.6%	58.7	4,817	6.2%
1965	A	817	0.2%	4,215	0.6%	58.9	4,867	1.0%
1966	A	888	8.7%	4,574	8.5%	58.8	5,508	13.2%
1967	A	900	1.4%	4,675	2.2%	59.3	5,613	1.9%
1968	A	983	9.2%	4,934	5.5%	57.3	5,896	5.0%
1969	A	1,143	16.3%	5,487	11.2%	54.8	6,853	16.2%
Compound Growth			7.1%		7.0%			6.5%
1970	A	1,273	11.4%	5,921	7.9%	53.1	7,266	6.0%
1971	A	1,407	10.5%	6,806	14.9%	55.2	7,738	6.5%
1972	A	1,659	17.9%	7,975	17.2%	54.9	8,617	11.4%
1973	A	1,811	9.2%	8,925	11.9%	56.3	9,209	6.9%
1974	A	2,032	12.2%	9,672	8.4%	54.3	9,412	2.2%
1975	A	2,068	1.8%	9,865	2.0%	54.5	9,274	-1.5%
1976	A	2,191	5.9%	10,605	7.5%	55.3	9,268	-0.1%
1977	A	2,373	8.3%	11,536	8.8%	55.5	9,570	3.3%
1978	A	2,549	7.4%	12,150	5.3%	54.4	9,918	3.6%
1979	A	2,579	1.2%	12,765	5.1%	56.5	10,209	2.9%
Compound Growth			8.5%		8.8%			4.1%
1980	A	2,773	7.5%	13,143	3.0%	54.1	9,995	-2.1%
1981	A	3,019	8.9%	14,660	11.5%	55.4	10,247	2.5%
1982	A	2,899	-4.0%	14,121	-3.7%	55.6	9,840	-4.0%
1983	A	2,899	0.0%	14,008	-0.8%	55.2	10,357	5.3%
1984	A	2,971	2.5%	14,339	2.4%	55.1	10,355	0.0%
1985	A	3,198	7.6%	15,229	6.2%	54.4	10,499	1.4%
1986	A	3,195	-0.1%	14,887	-2.2%	53.2	10,176	-3.1%
1987	A	3,159	-1.1%	15,902	6.8%	57.5	10,684	5.0%
1988	A	3,372	6.7%	16,638	4.6%	56.3	10,945	2.4%
1989	A	3,646	8.1%	17,777	6.8%	55.7	11,077	1.2%
Compound Growth			3.5%		3.4%			0.8%
1990	A	3,680	0.9%	18,151	2.1%	56.3	11,033	-0.4%
1991	A	3,532	-4.0%	18,213	0.3%	58.9	10,941	-0.8%
1992	A	3,796	7.5%	18,989	4.3%	57.1	11,035	0.9%
1993	A	3,802	0.2%	19,084	0.5%	57.3	11,041	0.1%
1994	A	4,214	10.8%	19,923	4.4%	54.0	11,712	6.1%
1995	A	4,420	4.9%	20,350	2.1%	52.6	11,218	-4.2%
1996	A	4,575	3.5%	21,801	7.1%	54.4	11,853	5.7%
1997	A	4,609	0.7%	22,794	4.6%	56.5	12,013	1.3%
1998	A	5,072	10.0%	23,368	2.5%	52.6	12,047	0.3%
1999	A	4,935	-2.7%	23,749	1.6%	54.9	12,191	1.2%
Compound Growth			3.1%		2.9%			1.0%
2000	A	5,479	11.0%	25,186	6.1%	52.5	13,053	7.1%
2001	A	5,687	3.8%	26,538	5.4%	53.3	13,312	2.0%
2002	A	5,803	2.0%	26,681	0.5%	52.5	13,025	-2.2%

APB_WP12 1/1

2004 APS/PWEC GENERATION ENERGY MIX

APS

	GWH	%
PALO VERDE	8,901	37.7%
COAL		
FOUR CORNERS 1-2-3	3,995	
FOUR CORNERS 4-5	1,554	
CHOLLA 1-2-3	4,867	
NAVAJO 1-2-3	2,482	
SUB-TOTAL	12,898	54.7%
GAS/OIL		
WEST PHOENIX CC 1-2-3	982	
WEST PHOENIX CT 1-2	24	
OCOTILLO STM 1-2	379	
OCOTILLO CT 1-2	37	
SAGUARO STM 1-2	161	
SAGUARO CT 1-2	61	
YUCCA CT 1-4	67	
DOUGLAS	0	
SUB-TOTAL	1,711	7.3%
OTHER		
CHILDS & IRVING	0	
ENVIRONMENTAL PORTFOLIO	79	
SUB-TOTAL	79	0.3%
TOTAL	23,589	

APS/PWEC

	GWH	%
PALO VERDE	8,901	30.9%
COAL		
FOUR CORNERS 1-2-3	3,936	
FOUR CORNERS 4-5	1,542	
CHOLLA 1-2-3	4,818	
NAVAJO 1-2-3	2,480	
SUB-TOTAL	12,776	44.3%
GAS/OIL		
WEST PHOENIX CC 1-2-3	380	
WEST PHOENIX CT 1-2	8	
OCOTILLO STM 1-2	141	
OCOTILLO CT 1-2	13	
SAGUARO STM 1-2	67	
SAGUARO CT 1-2	26	
YUCCA CT 1-4	30	
DOUGLAS	0	
W. PHOENIX CC 4	250	
W. PHOENIX CC 5	1,432	
REDHAWK CC 1&2	4,679	
SAGUARO SC 3	60	
SUB-TOTAL	7,086	24.6%
OTHER		
CHILDS & IRVING	0	
ENVIRONMENTAL PORTFOLIO	79	
SUB-TOTAL	79	0.3%
TOTAL	28,842	

APB_WP9 2/2

2003 Long Range Forecast
APS Annual Energy Forecast

Energy (GWHs)

Year	2003 LRF
2003	26,494
2004	27,841
2005	28,999
2006	30,178
2007	31,388
2008	32,670
2009	33,983
2010	35,305
2011	36,425
2012	37,531
2003 - 2008	4.3%

Reliability Must-Run Analysis

2003–2005

January 31, 2003
APS Transmission Planning
APS Resource Planning

Additionally, transmission alternatives were studied to compare the costs of mitigating the annual RMR conditions with the potential benefits of such mitigation.

The Phoenix area is a tight network of APS and Salt River Project (SRP) load, resources, and transmission facilities. Because the Phoenix system is highly integrated, the import limits must be determined for the combined area. This analysis was coordinated with SRP personnel, who had significant involvement in the study and were helpful in the overall analysis. The Western Area Power Administration (WAPA) participated in the study because their transmission facilities interface with the Phoenix network and also provided helpful comments.

After the combined import limit (SIL) for the Phoenix area was determined, RMR conditions were evaluated for APS based on APS' share of the combined import limits, APS' Phoenix-area load, and Phoenix area local generation, which includes generation owned by APS, SRP and Pinnacle West Energy Corporation (PWEC).

The Yuma area, which has a summer peak demand of approximately 300 MW, is served by an internal APS 69-kV sub-transmission network containing all of the load in the import-limited area. There are external ties to WAPA and the Imperial Irrigation District (IID), as well as a bulk power interface with the Palo Verde-to-North Gila transmission system. This analysis was coordinated with the WAPA Phoenix office to ensure accurate modeling.

B. Summary of Results

Results of the analysis for the three years of the study, which are summarized in the following tables, assume that present plans for system improvements are completed on schedule.

The following table summarizes the estimated RMR effects and costs for APS load in the Phoenix area.

Table ES1
Phoenix-Area RMR Effects and Costs for APS Load

Year	SIL[1] (MW)	Peak Demand (MW)	Max RMR[2] (MW)	RMR[3] Hours	RMR Energy[4] (GWH)	RMR Energy (% of total)	RMR Cost[5] ($M)
2003	3621	4456	835	518	170	0.9	0.03
2004	3658	4614	956	590	211	1.0	0.4
2005	3709	4733	1024	656	243	1.1	0.7

Table ES5
APS Phoenix-Area RMR Outside Economic Dispatch

Year	Hours outside economic dispatch	Energy outside economic dispatch (GWH)	RMR Cost ($M)
2003	32	7	0.03
2004	146	43	0.4
2005	174	44	0.7

The following table summarizes the estimated total number of hours that APS local Yuma generation must run out of economic dispatch, the amount of energy that is produced out of economic loading and the associated cost.

Table ES6
APS Yuma Area RMR Outside Economic Dispatch

Year	Hours outside economic dispatch	Energy outside economic dispatch (GWH)	RMR Cost ($M)
2003	1066	54	1.5
2004	974	49	1.3
2005	1196	56	1.5

C. Report Conclusions

Phoenix-Area Conclusions

1. During the summer, APS Phoenix-area load is expected to exceed the available transmission import capability for approximately 500 hours in 2003 and 650 hours in 2005. However, these hours represent only one percent of the annual energy requirements for APS' Phoenix area.

2. From a total Phoenix load, transmission, and resources viewpoint (APS, SRP, and PWEC), import limits are expected to cause APS local generation to be dispatched out of economic dispatch order for 32 hours in 2003, 146 hours in 2004, and 174 hours in 2005.

3. The estimated annual economic cost of Phoenix-area generation required to run out of economic dispatch order is estimated to be $720,000 in 2005, compared to a cost of approximately $16 million to relieve 452 MW of the Phoenix area's transmission constraint. Thus, the transmission alternative currently is not cost justified.

4. All Phoenix-area transmission and local generation are necessary to reliably serve all Phoenix-area peak load.

5. In capacity terms, APS will require from 365 MW in 2003 to 554 MW in 2005 of non-APS resources within the Phoenix area to serve the APS Phoenix-area load. These resources could be supplied from non-APS local generation (including PWEC West Phoenix Units 4 and 5, SRP Phoenix-area generation, or newly constructed local generation) or from remote generation delivered to APS using SRP Phoenix-area import capability.

6. Non-APS generation outside of the Phoenix load area (or inside the Phoenix load area when serving load outside) has the following impact on Phoenix-area import capability, measured as a percent of additional MW of import capability to MW of output:

   West Phoenix Units 4 and 5........................134%

   Sundance.. 35%

   Desert Basin... 24%

   Hassayampa Area.................................. 0%

   Panda Gila River.................................. 0%

7. Removing the transmission constraint would reduce total Phoenix-area air emissions by the following average annual amounts over the 2003-2005 period.

Table ES7
Phoenix-Area Air Emissions Reduction

Pollutant	Avg. Reduction (tons/year)	Reduction of Phoenix Area Emissions (% of total emissions from all sources)
VOC	1.0	0.001
NO_x	29.5	0.049
CO	5.5	0.002
PM_{10}	1.8	0.002

8. Removing the import restriction into the Phoenix area reduces the APS local generation capacity factor from 1.4% to 0.9%.

VII. Transmission Alternatives to Mitigate RMR

A. Phoenix Area

Two transmission alternatives were evaluated as potential mitigation of RMR conditions for the Phoenix area. For comparison purposes, a cost-benefit analysis was performed on the 2005 case with no Phoenix area generation operating.

The first alternative is the addition of 600 Mvar of shunt compensation (e.g. a static var compensator-SVC) at Kyrene with associated remedial action scheme logic and switching equipment to automatically insert the capacitor portion of the SVC at a very high speed upon detection of a loss of the Jojoba-Kyrene 500kV line. This alternative mitigates the voltage instability limitation by adding a strong reactive source of 600 Mvars of shunt compensation into the Phoenix area at the location that has lost the voltage support from the Palo Verde/Hassayampa area. This alternative would increase import capacity by 452 MW for a generation cost savings of $720,000 in 2005. However, the SVC alternative would cost $16 million. The annualized cost associated with this investment is estimated to be $2.4 million.

The second alternative considered was to modify the existing transmission system by looping the Jojoba-Kyrene 500kV line into the Rudd 500kV substation. This alternative is limited by the Rudd 500/230 kV transformers reaching thermal overload for a Rudd-Kyrene 500 kV line outage. This alternative provides no increase in SIL and, in fact, lowers the SIL due to increased loading on Rudd 500/230 kV transformers.

Neither of these alternatives is cost justified for the period covered by this study.

B. Yuma Area

For the 2005 timeframe, a second 500/69 kV 240 MVA transformer was added along with a 69 kV bus section breaker to the North Gila substation to evaluate the resultant increase in the SIL and MLSC for the Yuma area, and the resulting mitigation of RMR conditions. The cost of this project is estimated to be $3.5 million. With no local generation, completion of this project will increase the SIL by approximately 110 MW. Figure 11 shows the effect on the load serving capability (at or below the load forecast) of the Yuma area from adding the transformer.

This sensitivity case contains the same planned additions as in the 2005 base case (see Table 4) plus the addition of the re-conductoring of the 32nd Street-Ivalon 69 kV line and the Foothills-Foothills tap 69 kV line. These two additional projects are presently planned for 2006 and 2007, respectively, however both were advanced to maximize the effect of adding the second transformer.

If the evaporator vessel, compressor, recirculation pump, or heat exchanger are delivered to the site on December 3, 2000 or earlier, PWE will pay RCC a bonus of $1,000 per day for each equipment item delivered early. The bonus period will not exceed seven days. The total liquidated damages payable by RCC will not exceed 10% of the contract price. S&W Consultants believes, based on its review, that the liquidated damages provisions are sufficient to motivate RCC to meet their contractual obligations.

Firm Point-To-Point Transmission Service Agreements

PWE entered into two agreements with APS on March 15, 2000 for APS to provide firm transmission from both West Phoenix Unit 4 and West Phoenix Unit 5 to the Palo Verde 500 kV switchyard. For West Phoenix Unit 4, APS is providing 125 MW of reserved capacity beginning August 1, 2001 and ending March 31, 2004. For West Phoenix Unit 5, a reserved capacity of 525 MW will begin June 1, 2003 and end September 30, 2004. PWE will pay APS $1.43/kW of reserved capacity per month. There is no escalation or price adjustment clause in the agreement. PWE has requested that APS Transmission Services construct the interconnection facilities and will pay the total cost of the construction.

Guarantee Agreement

The Transmission Service Agreements described above are backed by a parent guarantee whereby PWC irrevocably and unconditionally guarantees the timely payment of PWE's obligations to APS.

Memorandum of Understanding Concerning Interconnection Construction

The Memorandum of Understanding ("MOU") between PWE and APS Transmission Services is dated June 20, 2000 and provides for APS Transmission Services to design, engineer, and construct the transmission interconnections necessary to connect the West Phoenix Unit 4 to the APS switchyard at West Phoenix. The MOU effective date was June 8, 2000 and remains in effect until the project is complete, currently estimated to be March 1, 2001. This provides a schedule margin of five months before West Phoenix Unit 4 is expected to go on-line. There are no penalties for schedule delays caused by APS Transmission Services.

Contract for Services – Special Service Request – West Phoenix Unit 4

This contract between PWE and APS Transmission Construction, dated July 25, 2000, provides for APS Transmission Construction to relocate an existing West Phoenix CC 3 transformer to its new West Phoenix Unit 4 position, install a new West Phoenix CC 3 transformer, perform all testing required by the Interconnection Agreement to allow West Phoenix Unit 4 to connect to the APS transmission system, and provide technical support for power system stabilizer, digital fault recorder, and generator, exciter, and governor model verification. This contract became effective July 25, 2000 and will remain in effect until the project is complete. The completion date for the transformer portion of the contract is expected to be April 1, 2001, which provides a four-month schedule margin. The other services being provided under this contract are expected to be complete by August 1, 2001. There are no penalties for schedule delays caused by APS Transmission Construction.

Other Contracts for Services

Other Contracts for Services between PWE and APS for West Phoenix include:

- Purchase and install new CEMS
- Retrofit a SCR on West Phoenix CC 3
- Purchase new GSU transformer for West Phoenix CC3, and relocate existing West Phoenix CC3 GSU to West Phoenix Unit 4
- Purchase and install a plantwide DCS
- Purchase DCS for West Phoenix Unit 4 HRSG, brine concentrator, gas heating skid, GE CT hardwired I/O and BOP equipment
- Upgrade the telephone system at West Phoenix

APB-WP28 12/39

DRAFT DECEMBER 1, 2003

ASSET PURCHASE AGREEMENT

by and among

____
as Seller[1]

and

ARIZONA PUBLIC SERVICE COMPANY,
as Purchaser

dated as of ________, 2003

[1] As noted in the Request for Proposals, APS requires a creditworthy party, either as principal or guarantor, to be a party to this Asset Purchase Agreement.

8.2 ***Performance.*** Seller shall have performed and complied, in all respects, with the agreements, covenants and obligations required by this Agreement to be so performed or complied with by Seller at or before the Closing.

8.3 ***Deliveries.*** Seller shall have made all deliveries required of it under **Section 3.4** hereof.

8.4 ***Orders and Laws.*** There shall not be any litigation or proceedings (filed by a Person other than Purchaser or its Affiliates) or Law or order restraining, enjoining or otherwise prohibiting or making illegal or threatening to restrain, enjoin or otherwise prohibit or make illegal the consummation of any of the transactions contemplated by this Agreement.

8.5 ***Consents and Approvals.*** The consents and approvals listed on Schedule 8.5 shall have been duly obtained, made or given and shall be in full force and effect.

8.6 ***Material Adverse Effect.*** There shall not have occurred and be continuing a Material Adverse Effect.

8.7 ***Approvals of Governmental Authorities.***

(a) All consents and approvals of Governmental Authorities required for the consummation of the transactions contemplated hereby or by the Ancillary Agreements, including, without limitation, the Seller Approvals and the Purchaser Approvals, shall have become Final Orders with such terms and conditions as shall have been imposed by the Governmental Authority issuing such Final Order, and such terms or conditions shall be acceptable in all respects to Purchaser in its sole discretion.

(b) The ACC shall have issued one or more orders, which shall be acceptable in all respects to Purchaser in its sole and absolute discretion and each of which shall have become a Final Order, approving the transactions contemplated hereby and by the Ancillary Documents and the regulatory treatment of the Purchased Assets, including, without limitation, (i) to the extent Purchaser, in its sole discretion, determines such approval is necessary, Purchaser's financing of the Purchase Price, and (ii) the inclusion, on or before June 1, 2007, in Purchaser's rate base of the Purchased Assets at Net Book Value without any direct or indirect disallowance, as well as (A) the timely recovery in Purchaser's retail rates of all reasonable costs of owning and operating the Purchased Assets after the termination or expiration of the term of the Sale Back Agreement, and (B) the deferral and recovery of any adverse earnings impact on Purchaser attributable to the Sale Back Agreement.

8.8 ***Transferred Permits.*** Purchaser shall be satisfied that all Environmental Permits and Permits will be transferred to Purchaser or obtained by Purchaser on or before the Closing Date.

8.9 ***Title Insurance.*** Purchaser shall have received unconditional and binding commitments to issue policies of title insurance consistent with **Section 6.11**, dated the Closing Date, in an aggregate amount equal to the amount of the Purchase Price allocated to the Real Property, deleting all requirements listed in ALTA Schedule B-1, amending the effective date to the date and time of recordation of the Deed conveying title to the Real Property to Purchaser

SMW_WP17
1/1

Estimated Saving by Acquiring PWEC Reliability Units vs New Build

	Year	MW	$/Kw	$ Million	30 year (1) Revenue Requirement $ Million
New CC Cost	2003	500	622	311.0	
	2004	500	631	315.7	
	2005	500	641	320.4	
PWEC Assets (rate base)	6/30/2004	1681	533	896.1	2467
PWEC Assets New Build	1/1/2005	1681	641	1077.2	2966
Savings			107.7	181.1	499

Note 1: Revenue requirement to cover capital investment and depreciation only

	Capital Structure	Cost	Weighted Cost	Income Taxes	After Tax
Debt	55	0.057	3.135	1.238	1.897
Equity	45	0.115	5.175	0.000	5.175
Total	100		8.31	1.238	7.072
		Revenue Grossup factor			1.653
		Pre-tax			11.689

RC00118

Business

APS PREDICTS SHORTFALL, LOOKS TO BUY A PLANT

By Max Jarman, The Arizona Republic

272 words

26 November 2003

The Arizona Republic

Final Chaser

D1

English

Arizona Public Service Co. is predicting a power shortfall by 2007 and is looking to buy an existing power plant to cover the gap.

Consumers could eventually pick up the estimated $200 million to $300 million tab for such a facility through higher rates. The state's largest electric utility also is considering building its own facility or buying a plant in the planning stages.

APS Executive Vice President Steve Wheeler said the company is facing shortfalls during periods of peak electricity demand in 2005 and 2006, but that by 2007 demand will be great enough to warrant buying or building a plant.

The utility hopes to take advantage of a buyer's market for Arizona power plants caused by a spate of new plant construction and the subsequent collapse of wholesale prices.

"We understand several merchant plant owners might be interested in selling, and we want to see what's out there," Wheeler said.

Without the new plant, Wheeler said APS could be forced to rely on the spot market to cover shortfalls. The reliance of spot power buys in California bankrupted one of the state's largest electric utilities and led to huge rate increases for consumers.

Other power companies are also shopping for plants. Earlier this year, Salt River Project paid $289 million for the Desert Basin Power Plant developed by Reliant Energy in Casa Grande. The price was about what Reliant paid to build it.

Billionaires Warren Buffett and Carl Icahn are on the hunt for power plants at near-liquidation prices, too.

Document PHX0000020031127dzbq0003m

Accion Group

to

Arizona Corporation Commission

INDEPENDENT MONITOR'S FINAL REPORT
ON
TRACK B SOLICITATION

MAY 27, 2003

Submitted by:
Accion Group, Inc.
244 North Main Street
Concord, New Hampshire 03301
Telephone: 603-229-1644
Fax: 603-225-4923
Email: advisors@acciongroup.com

manner consistent with good commercial practices and the bidders concerns, but still comply with the Solicitation's conditions.

- **Inclusive evaluation process**. In an effort to maximize the number of successful bidders, the evaluation process was designed to have only a minimum number of non-negotiable conditions A bid did not advance to full evaluation only if the bid fee was not paid. All bids meeting that condition were evaluated to determine if the bidder was technically capable of providing the service. The remaining evaluation factors were applied on a consistent basis in order to distinguish among bids. All of the evaluation criteria were clearly articulated in the RFP.
- **Successful outcome**. APS received more than 175 bids from 10 bidders and TEP evaluated 26 bids from 5 bidders. Based on the number of bids received, we believe that the process produced competitive prices for the products purchased.

As previously noted, the process resulted in two supply contracts for TEP – the first with PPL Energy Plus, LLC for 37 MW in 2003 and for 75 MW in 2004 through 2006, and the second with Panda Gila River, LC for 50 MW of June through September on peak capacity in 2003 through 2006. APS contracted for 1700 MW of July through September 2003 capacity and for 1700 MW of June through September 2004 through 2006 capacity from Pinnacle West Energy Corp., and for 112 MW of capacity from PPL Energy Plus LLC for July through September of 2003 and for 150 MW of capacity for the periods June through September of 2004 and 2005. Additionally, APS executed a contract with Panda Gila River LC for

1. Bid Fee

Bid fees are frequently used in competitive Solicitations, though not in all Solicitations. Participants to the Track B workshops agreed that any bid fee should be applicable to each bidder, as opposed to each bid, and recognized the Track B Solicitation would require APS and TEP to incur additional costs. Most bidders were willing to pay the $10,000 bid fee, but some did not. Two bidders submitted bids, but failed to provide the requisite bid fee. Both companies were given additional days to submit the bid fee, but chose to be disqualified rather than pay the fee.

From our discussion with bidders, we believe other potential bidders may have elected not to participate because of the bid fee. Some of these bidders either have or had contracts to supply APS or TEP that were arranged bilaterally, without a bid fee. Some may have chosen to wait until the Solicitation was over and to then deal with the utilities bilaterally because the bid fee represented a disproportionately large percentage of their anticipated profit margin.

We believe the bid fee was reasonable as applied, that is, each bidder paid one bid fee. At the same time, APS and TEP may have received more competitive bids if there had been no bid fee. In future solicitations, it may be appropriate to eliminate bid fees for all bids for short-term standard products.

2. Regulatory Out

APS proposed the inclusion of a "Regulatory Out" provision in all contracts with power deliveries after 2005. The provision permits APS or bidders to terminate a Track B power supply contract in the event of certain regulatory actions or inactions. This provision appears to have been acceptable to the marketers that submitted bids.

However, it was identified as one reason some bidders chose not to provide bids for power to be supplied after 2005.

PWEC, one of the few bidders offering supplies beyond 2005, accepted the Regulatory Out provision, but, for purposes of its firm energy bid, it required a risk premium for energy contracted through the year 2006. PWEC offered prices for 2006 power that differed, depending on whether the Regulatory Out clause was included in the contract. By PWEC's calculation, the risk premium associated with the Regulatory Out provision for a firm energy commitment through 2006 was $28 million . PWEC's firm energy bid was not among the bids accepted by APS.

Prior to any future solicitation, the ACC should determine whether it will permit the use of Regulatory Out clauses in mandated solicitations.

3. Bidder Certificate

The ACC Decision required each bidder to certify it would not engage in unlawful market manipulation, and that the ACC may terminate a contract and exclude the bidder from future solicitations if it violates this pledge. Further, the certificate needed to be signed by the bidder's Chief Financial Officer (CFO). This requirement created considerable concern among bidders, due to a misunderstanding of the scope and intent of the requirement. APS required bidders to execute a separate Bidder Certificate (Attachment 23), and TEP included the commitment in the body of the RFP bidders were required to sign.

Most bidders agreed to a verbatim recitation of the Decision requirement, while expressing reservations. One potential bidder expressly declined to bid because of uncertainty of what obligations could flow from agreeing to the Decision requirement, as drafted. At least two bidders submitted bids without the signature of their CFO, while others submitted bids with the understanding that clarification would be available before contracts would be executed. Release of a Federal Energy Regulatory Commission (FERC) Staff Report on market manipulation, after the Decision was issued, added to the confusion. The principal concern of bidders was a desire to avoid creating a dispute between FERC and the ACC concerning jurisdiction to determine market manipulation, and whether the ACC would attempt to rescind a contract retroactively to the date of execution.

With the assistance of the Staff, the Independent Monitor provided clarification of the ACC requirements. The clarification assured bidders that the ACC required FERC's authority to determine market manipulation, and that the ACC would only act after a FERC determination. Also, the Independent Monitor clarified that the ACC would only terminate contracts prospectively from a determination of unlawful market manipulation. Finally, the Independent Monitor confirmed that certification by the most senior officer of a bidder's company was acceptable, and that the absence of an officer holding the title of CFO was not a barrier to executing a contract. Prior to future solicitations, the Commission should clarify the scope and intent of the required Officer's Certification.

4. Procurement Freeze

APS and TEP were required to procure their unmet needs for 2003 through the Track B Solicitation process before contracting for or otherwise hedging their needs through bilateral contracts or open market transactions. When the Track B process became more protracted than expected, the utilities found themselves unable to take advantage of market opportunities even as they foresaw market prices rising.

We have not identified lost opportunities from this approach, and we appreciate the legitimate reasons for requiring the concurrent solicitation of all needs.

Significant Results

AZ Merchant Generation

- Over 20,000 MW merchant generation is public in AZ
- Estimated 13,000 is projected to be built by 2010
- Capacity margins will be pushed to near 35%
- Over 5,000 MWs will require home for other markets (on-peak)
- Over 10,000 MWs will require displacement generation in Calf (off-peak)
- Transmission lines to California becomes MUST
- Down stream (other end of PV-Devers line) projects no help
- El Paso's southern line will require expansion (double current capacity)

Market Prices

- California (CDWR) contracts - $61- 79 / MWH ($69 / MWH 10 Yrs)
- PV forward market continues to be above $50 / MWH over 10 yrs
- Simulated market ranges $35 - 40 / MWH over 10 yrs

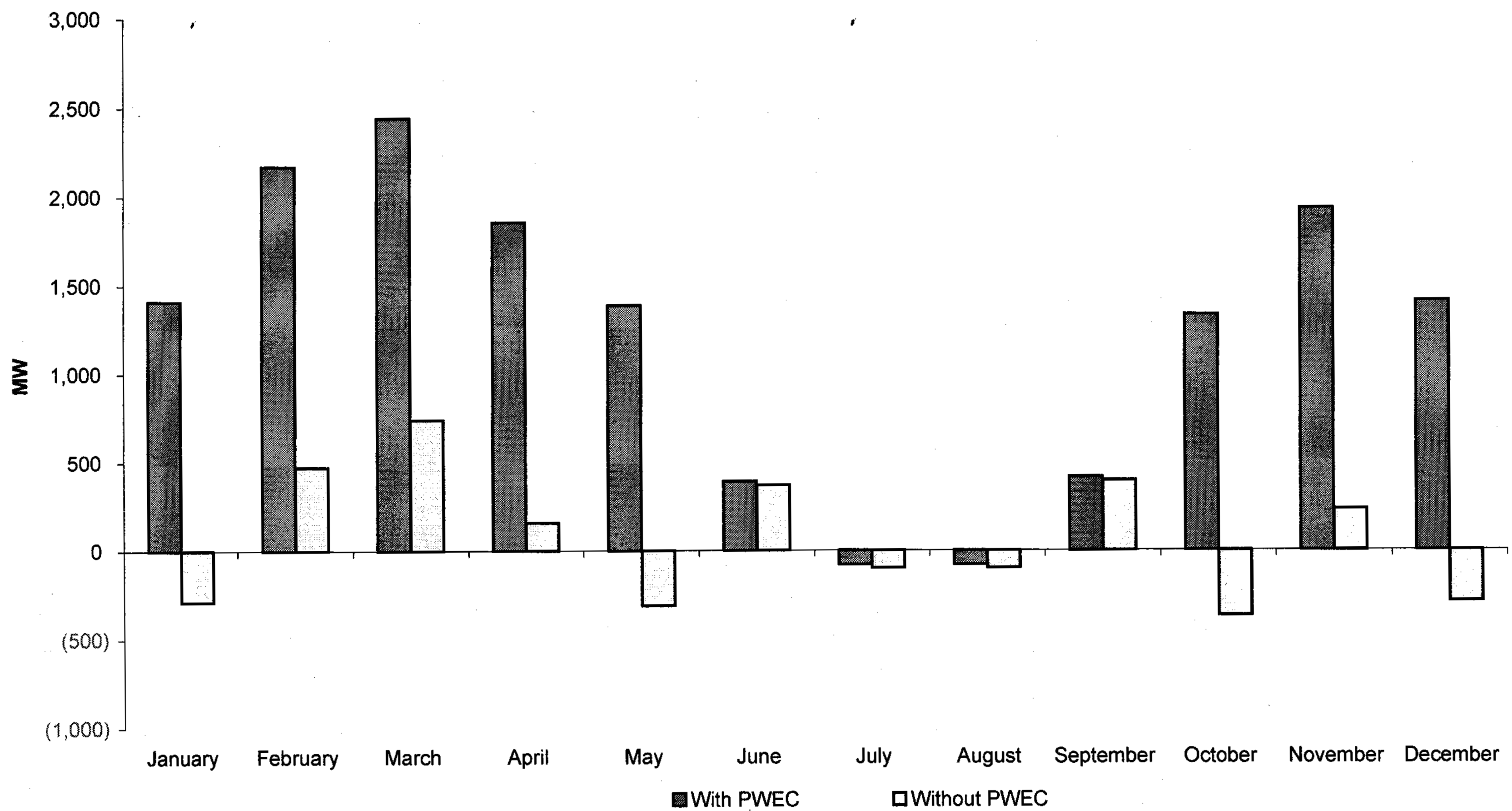
APB_WP30 11/04

Arizona Supply & Demand

- Includes APS, PWEC, SRP, TEP, AEPCO, WAPA, NPC and Merchant Generation
- Over 20,500 MW of new generation proposed in Arizona.
- 12,200 new generation built in Arizona by 2006
- Reference Case
  - Load Growth 2.86% 2001-2010
  - APS Purchases all PWEC output, still needs market purchases. Enterprise is short.
  - Up to 650 MW of new generation trapped inside Arizona in 2006-2009
- Scenario 1
  - APS and SRP purchase 70% of the non-PWEC/non-SRP new merchant generation in Arizona
  - PWEC has up to 3,000 MW of generation to market
- Scenario 2
  - Load Growth 3.82% 2001-2010
  - APS and SRP purchase 70% Arizona Merchant Generation (same as Scenario 1)
  - PWEC has up to 2,600 MW of generation to market
- Scenario 3
  - Low Load Growth 1.78% 2001-2010
  - APS and SRP purchase 70% Arizona Merchant Generation (same as Scenario 1)
  - PWEC has up to 3,300 MW of generation to market
  - Up to 1,925 MW of generation trapped inside Arizona 2005-2010+

AfB_WP30 4/104

Exhibit JDT-4
APS MONTHLY SURPLUS GENERATION CAPACITY
2004

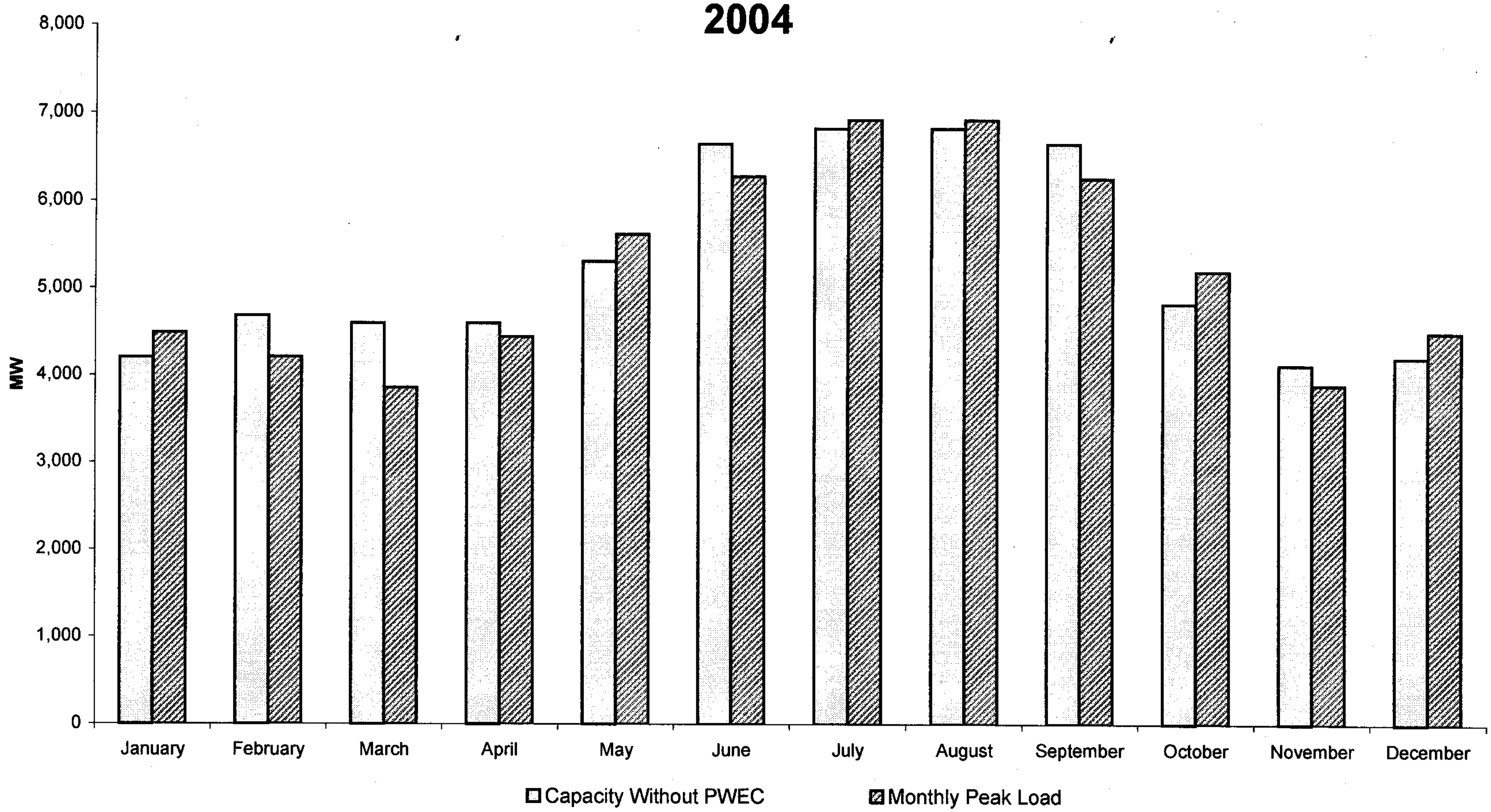


Notes:

1) "With PWEC" refers to the generation capacity APS would own if the rate base request were approved. "Without PWEC" refers to the generation capacity currently owned, and available under contract by APS, and therefore includes APS's Track B purchases.
2) Capacities are not adjusted to account for variations that will result due to maintanance and forced outages.
3) Pacificorp exchange allows APS access to capacity from May 15 to September 15 and allows Pacificorp access to APS capacity from October 15 to February 15. It is assumed that APS receives the capacity or retains its own capacity in agreement with its intramonth expected peak demands. (i.e. In the figure, APS receives exchange in May and September, and does not provide exchange in February and October.
4) Monthly demands include 15% reserve margin.
5) Monthly demands have not been updated to reflect any more recent hourly forecasts that APS may have developed.

Sources: APB_WP9, DR001654_0051_TRACKB_APS-EWEN-WORKPAPERS, 12/03 APS RFP (Summer Supply and Demand Balance, 1/9/04); RC00819.

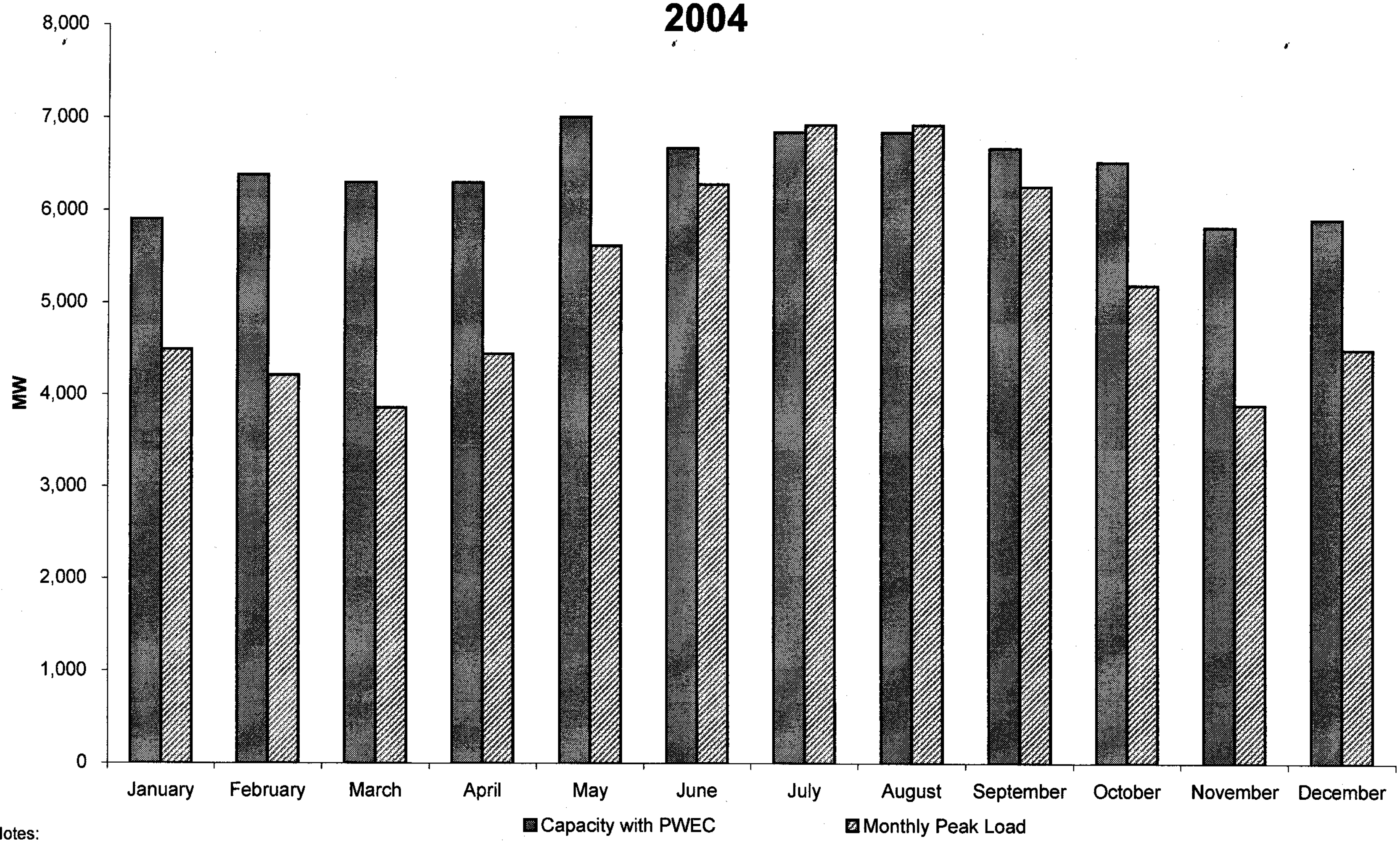
Exhibit JDT-5
APS FORECASTED MONTHLY PEAK LOAD v. GENERATION CAPACITY WITHOUT PWEC ASSETS
2004



Notes:
1) "Without PWEC" refers to the generation capacity currently owned, and available under contract by APS, and therefore includes APS's Track B purchases.
2) Capacities are not adjusted to account for variations that will result due to maintanance and forced outages.
3) Pacificorp exchange allows APS access to capacity from May 15 to September 15 and allows Pacificorp access to APS capacity from October 15 to February 15. It is assumed that APS receives the capacity or retains its own capacity in agreement with its intramonth expected peak demands. (i.e. In the figure, APS receives exchange in May and September, and does not provide exchange in February and October.
4) Monthly demands include 15% reserve margin.
5) Monthly demands have not been updated to reflect any more recent hourly forecasts that APS may have developed.

Sources: APB_WP9, DR001654_0051_TRACKB_APS-EWEN-WORKPAPERS, 12/03 APS RFP

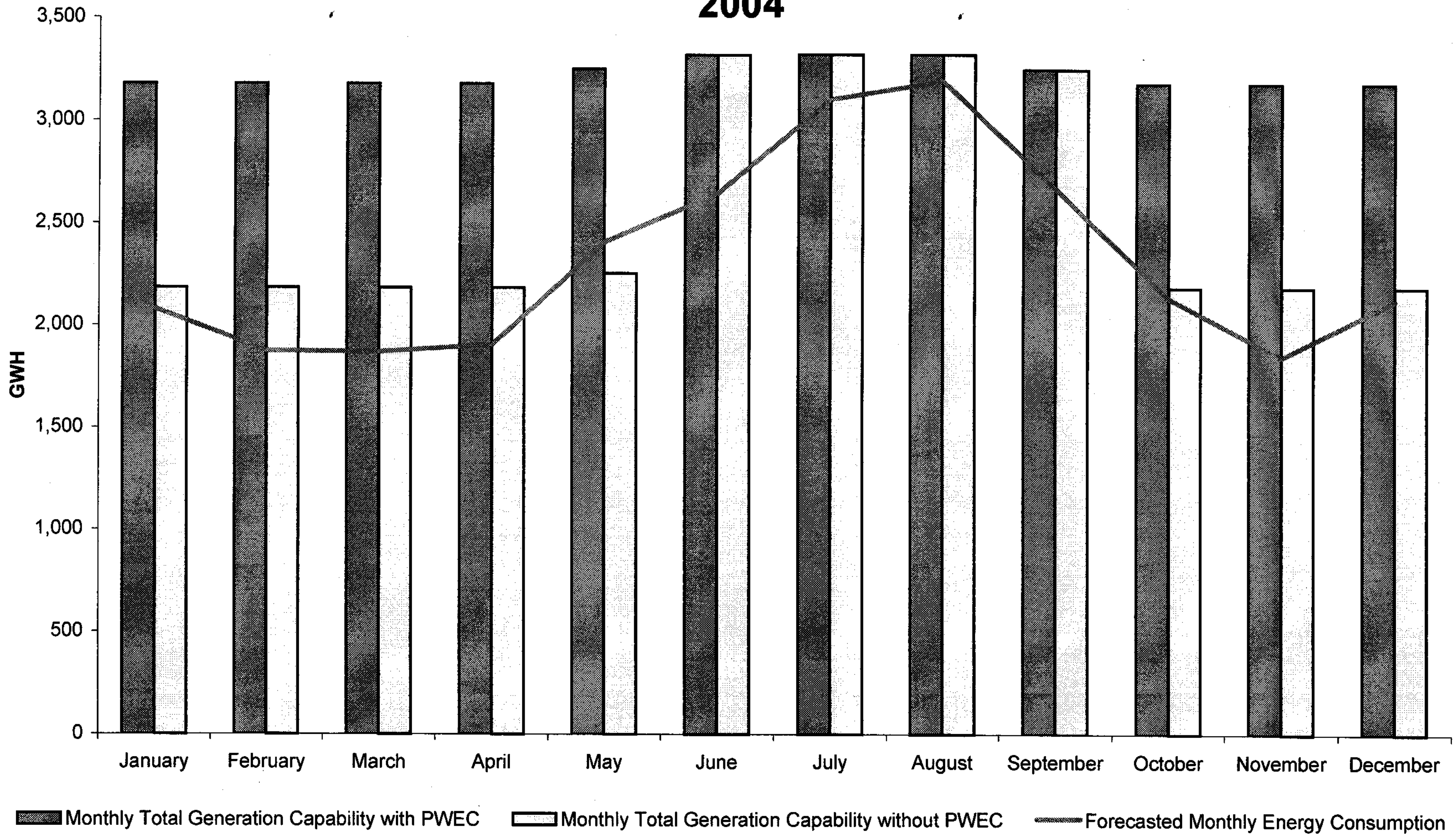
Exhibit JDT-6
APS FORECASTED MONTHLY PEAK LOAD v. GENERATION CAPACITY WITH PWEC ASSETS
2004



Notes:
1) "With PWEC" refers to the generation capacity APS would own if the rate base request were approved.
2) Capacities are not adjusted to account for variations that will result due to maintanance and forced outages.
3) Pacificorp exchange allows APS access to capacity from May 15 to September 15 and allows Pacificorp access to APS capacity from October 15 to February 15. It is assumed that APS receives the capacity or retains its own capacity in agreement with its intramonth expected peak demands. (i.e. In the figure, APS receives exchange in May and September, and does not provide exchange in February and October.
4) Monthly demands include 15% reserve margin.
5) Monthly demands have not been updated to reflect any more recent hourly forecasts that APS may have developed.

Sources: APB_WP9, DR001654_0051_TRACKB_APS-EWEN-WORKPAPERS, 12/03 APS RFP

Exhibit JDT-7
WITH PWEC ASSETS, APS HAS ENORMOUS EXCESS ENERGY GENERATION CAPABILITY
2004



Notes: Monthly Production Capability of plants calculated as follows: Coal and Combined Cycle at 85% capacity factor, Oil and gas-fired steam at 60% capacity factor, Hydro and CTs are excluded, SRP contract reported at minimum historical capacity factor."With PWEC" refers to the generation capacity APS would own if the rate base request were approved. "Without PWEC" refers to the generation capacity currently owned, and available under contract by APS and therefore includes APS's Track B purchases.

Sources: EIA 861, WECC Summary of Estimated Loads and Resources, APS Response to MR 1.4, APB_WP9, RC01035.

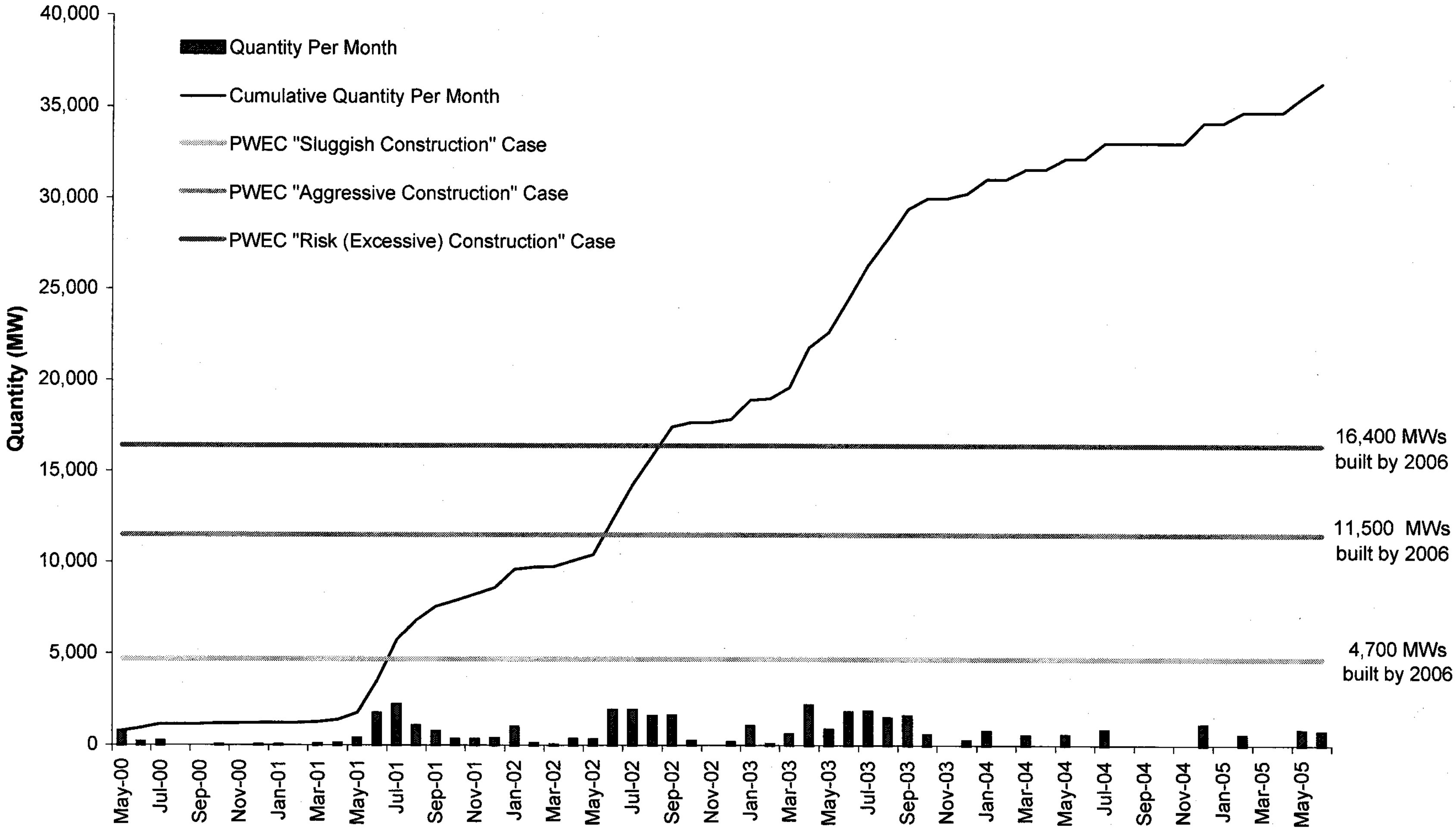
Exhibit JDT-8
RESULTS OF VARIOUS WESTERN UTILITIES' RFPs

Utility	Date	Time period	Product	MWs	Total responses
Pacificorp	Sep-01	2 months - 12 years	capacity/energy price/tolling - various		
NorthWestern Energy	Oct-01	various terms, beginning July 2002 for up to 11 years	full requirements; base load; peaking/reserves	1,100	14
Aquila	Jun-02	Starting July 2007	capacity	300	Confidential
Xcel	Dec-01	May 2005 - 2009	power	1,000	27
Cheyenne Light Fuel and Power Co	Dec-02	Starting January 2004, 3-15 years	full requirement	~146	
Idaho Power	Feb-03	Starting April 2004	devoted dispatchable energy; construction of new capacity	200	11
APS	Mar-03	1 year	summer load	2,460	
TEP	Mar-03	1 year	summer load	760	
Pacificorp	Jun-03	2004 - 2007	June - August peaking power	225	
Pacificorp	Jun-03	2005-2012	asset-based energy contracts in 25 MW blocks, for April	175	
Pacificorp	Jun-03	online by 2005	peaking plant	200	
Pacificorp	Jun-03	online by 2007	baseload plant	570	
El Paso	Jan-03	Starting 2006, 2009		150 (2006), 250 (2009)	22
Nevada Power	Jul-03	2004		2,000	
Portland General	Jun-03	Capacity starting December 2005, energy starting October 2006	energy (600 MW) capacity (400 MW)	1,000	40
SDG&E	May-03	2005-2007	capacity; energy	1,165	22*
WAPA	Oct-03	November 2003 - September 2004	capacity	12-23 MW	
Puget Sound Energy	Dec-03	starting 2005	generation/long-term contract	355	N/A

Note: Number of responses reflects number of entities responding, not total number of proposals received, where possible. A * indicates the total number of responses was the only publicly available information.

Source: Various trade press.

Exhibit JDT-9
CUMULATIVE AND MONTHLY QUANTITY OF NEW POWER GENERATION PLANTS BY ONLINE DATE v PWEC'S AUGUST 1999 NEW GENERATION RISK ASSESSMENT
Western US*



* Western US includes the WECC states: California, Arizona, Nevada, New Mexico, Utah, Idaho, Washington, Oregon, Colorado, Wyoming, and Montana.

Sources: RC02431; California Energy Commission; Second Biennial Transmission Assessment, 2002-2020; various trade press.

DIRECT TESTIMONY OF JOSEPH P. KALT

On Behalf of Arizona Competitive Power Alliance

Docket No. E-01345A-03- ____

February 3, 2004

Table of Contents

I. QUALIFICATIONS

Q: **WHAT IS YOUR NAME AND BY WHOM ARE YOU EMPLOYED?**

A: My name is Joseph P. Kalt. I am the Ford Foundation Professor of International Political Economy at the John F. Kennedy School of Government, Harvard University, Cambridge, MA 02138. The Kennedy School of Government is Harvard's graduate school for public policy and administration. I also work as a senior economist with Lexecon, an FTI Company. Lexecon is an economics consulting firm with offices in Cambridge, Massachusetts, and Chicago, Illinois. My *curriculum vitae* is attached hereto (Exhibit JPK-1) and lists my prior testimony as an expert and my publications.

Q: **PLEASE SUMMARIZE YOUR PROFESSIONAL AND EDUCATIONAL BACKGROUND.**

A: I hold B.A., M.A., and Ph.D. degrees in economics and I am a specialist in the economics of competition, antitrust, and regulation, with particular emphasis on the energy and natural resource sectors. Throughout my professional career, I have conducted research, published, taught, and testified extensively on the economics of market structure, contracting, regulation, pricing, valuation, and strategic performance, with particular emphasis on the energy industries. At Harvard, I served as an Instructor, Assistant Professor, and Associate Professor in the Department of Economics from 1978 to 1986, prior to joining the faculty of the Kennedy School of Government as a professor with tenure in 1986. At the Kennedy School, I have also served as Chair of the Economics and Quantitative Methods Cluster, Faculty Chair and Academic Dean for Research, Chair of Teaching Programs, and Chair of Ph.D. Programs. In the Department of Economics, I had primary responsibility for teaching the graduate and undergraduate courses in the economics of regulation and antitrust. At the Kennedy School, my teaching responsibilities have included the economics of regulation and antitrust; the economics of public policy, natural resource and environmental policy; and economic development on American Indian reservations.

My work as a professor in a graduate school for public policy and public administration entails consideration of the criteria of sound public policy, particularly as applied to questions of the regulation of economic affairs. Working with Lexecon (and its predecessors), I provide expert economic analysis and advice, particularly in regulated industries and to public policymakers concerned with such industries. My work in this matter has been supported by Lexecon and its professional staff. The views expressed are my own.

Q: **PLEASE DESCRIBE YOUR BACKGROUND AS IT RELATES TO THIS PROCEEDING.**

A: In the course of my academic and consulting experience, I have studied extensively the economics of the electric power, oil, natural gas, and coal industries, and the impacts on these industries of changing regulatory and competitive environments. I have provided expert testimony on these issues in various state and federal courts, as well as the United States Congress. Over my career, I have testified numerous times before the Federal Energy Regulatory Commission ("FERC") on matters ranging from electric power merger and transmission policy to natural gas pipeline and marketing policy. I have recently studied and testified at length as an expert on behalf of El Paso Merchant Energy, L.P. in the FERC's Nevada Power Company/Sierra Pacific Power Company, Public Utilities Commission of the State of California/California Electricity Oversight Board and PacifiCorp proceedings regarding the role of forward contracts in the electricity industry and the extent to which dysfunctional spot markets in California may have impacted forward electricity markets.

II. PURPOSE OF TESTIMONY AND SUMMARY OF FINDINGS

Q: **ON WHOSE BEHALF IS YOUR TESTIMONY SUBMITTED?**

A: My testimony is submitted on behalf of the Arizona Competitive Power Alliance ("Alliance").

Q: **WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

A: Along with my Lexecon colleague, Mr. Jeffrey Tranen, I have been asked by the Alliance to analyze the request of Arizona Public Service Company ("APS" or "Company") for authorization from the Arizona Corporation Commission ("Commission") to transfer into APS's rate base at 2004 depreciated original cost approximately 1,700 MW of electricity generation capacity[1] built by its unregulated affiliate, Pinnacle West Energy Company ("PWEC"). As a part of this proposal, APS also seeks to abrogate contracts it recently executed with PWEC to provide summer

[1] The plants are Red Hawk Units 1 & 2 with a capacity of 495 MW each; West Phoenix 4 at 120 MW; West Phoenix 5 at 525 MW; and, Saguaro SC 3 at 80 MW, which totals a little more than 1,700 MW of capacity.

capacity and energy through 2006 ("Track B Contracts").[2] I have been asked to investigate APS's assertions that it is in the public interest for APS to acquire and ratebase PWEC's generation assets ("PWEC assets"), and abrogate the Track B Contracts.

Q: **TO WHICH ASPECTS OF APS'S DIRECT CASE DO THE ALLIANCE'S WITNESSES RESPOND?**

A: Mr. Tranen and I respond to the testimony on the proposed PWEC asset transfer sponsored by Messrs. Wheeler, Robinson, Gordon, Landon, Hieronymus and Bhatti.

Q: **ARE YOU FAMILIAR WITH COMMISSIONER GLEASON'S LETTER TO THE PARTIES IN THIS DOCKET REGARDING ISSUES TO BE ADDRESSED IN TESTIMONY?**

A: Yes. The first two questions ask how the market value of a generation plant should be calculated or otherwise determined. In my testimony and in Mr. Tranen's, we discuss the failure of APS to provide any market valuation of these generation plants or any comparison of such a valuation to the book value price it proposes to use. Effectively, our response to these questions is that the market value of the PWEC assets is critical evidence for the Commission that APS should have provided in the first instance in support of its ratebasing proposal. Moreover, to establish the market value would require a fair and transparent request for a proposal process in which

---

[2] As I use the term in my testimony, Track B Contracts means APS's purchase contracts with PWEC that resulted from the initial Track B solicitation that took place over the past year. Although, I recognize that there are other smaller contracts that APS entered into as a result of the Track B solicitation, they are not covered by this reference.

PWEC competed directly with other market participants for the opportunity to supply APS.

Commissioner Gleason's third question asks about the merchant generation available to serve APS's customers. Mr. Tranen's testimony addresses the competitive market options available to APS instead of ratebasing the PWEC assets; I address this issue more generally by examining the reasonableness of continued reliance on the market for a portion of APS's supply.

Commissioner Gleason's fourth question asks for citation of relevant precedent from other jurisdictions. My testimony addresses the general concerns of regulators here and elsewhere about transactions between a utility and its affiliate. Because this is primarily a legal issue, however, I understand that the answer to this question will be contained in the Alliance's pre-hearing brief in this case.

Commissioner Gleason's final question regarding the impact of APS's proposal on competitive solicitations and the competitive market is addressed in both my testimony and Mr. Tranen's.

Q: **WHAT JUSTIFICATION HAS APS OFFERED IN SUPPORT OF ITS REQUEST TO ACQUIRE AND RATEBASE THE PWEC ASSETS?**

A: APS's filing relies primarily on its assertion that the PWEC assets were developed and have been managed using an "APS centric" planning framework.[3] In other words, APS apparently wants the Commission to believe that in building these large electricity generation plants using its sole shareholder Pinnacle West Capital Corp.'s ("PWCC") money, PWEC has always intended to provide APS's ratepayers a first call on the generation capability of these plants even at lower than market prices. APS further contends that PWEC has not acted as a profit maximizing firm, but instead has sacrificed significant financial gains when it purportedly chose to not market generation from these power plants at times of elevated market prices as it was holding the assets back for APS consumers.[4] APS's filing goes on to argue that although there are costs associated with ratebasing these power plants, there are likely future benefits that outweigh these costs to APS's ratepayers.[5]

A second theme in APS's filing is that APS should not rely on the competitive wholesale electricity market as it will likely be unable to provide reliable supplies sometime after 2006. Even if sufficient supplies are available in the market, APS contends that these supplies would be more expensive to ratepayers than the PWEC assets.

Finally, APS presents a theoretical discussion focused on purported benefits of additional vertical integration achieved by acquiring these assets. APS does not, however, offer evidence to substantiate this argument.

Q: **PLEASE SUMMARIZE YOUR TESTIMONY.**

A: In my testimony, I consider APS's request from the perspective of Arizona customers and ask if it is in the public interest for APS to acquire and ratebase the PWEC assets at book value. Within this framework, I focus in particular on the implications for customer prices, competition, and regulation. As I describe in my testimony, each of these factors is at play in APS's request. As Mr. Tranen shows, APS seeks to

[3] Direct Testimony of Hieronymous, Page 6:15-23.

[4] Id. at 26:11-13, 37:19-21, 38:19-21; Bhatti Direct Testimony at Page 18:16-21.

substantially increase its rates to cover the revenue requirement associated with these new assets. These expenses are much greater than what the market indicates APS must bear to reliably serve its customers.

Further, a central impact of APS's request will be to favor one competitive supplier—PWEC—over other competitive suppliers, including those in the Alliance who have no such ratebasing option available for their newly built generation capacity. APS's request amounts to the exercise of market power by APS, with attendant untoward effects on rates. That is, APS's request asks the Commission to allow APS to exercise market power over its customers by locking in prices that are higher than would otherwise prevail in the competitive market. If this were not true, PWCC, the sole shareholder of both APS and PWEC, would see more value in keeping the PWEC assets unregulated.

Q: **PLEASE OUTLINE THE FRAMEWORK OF YOUR ANALYSIS.**

A. In my analysis, I consider the public policy implications of the Commission's review of APS's requested treatment of the PWEC assets. Because most of APS's ratepayers lack direct access to competitive suppliers of power, APS's ratepayers rely on the Commission to protect them from poor management decisions and exercises of market power by APS, particularly when the risk of self-dealing with an affiliate is present. On these traditional issues of prudence and fairness, APS's filing is wholly inadequate.

APS's filing is targeted largely at evaluating whether PWCC's investment in the PWEC assets (made in anticipation of selling their output at "market" prices) was

[5] Hieronymus Direct Testimony at Page 9:9-10:4 and Bhatti Direct Testimony at Page 5:15-17.

prudent, an issue that is fundamentally irrelevant to this proceeding. In characterizing the investments as "APS-centric," APS simply waves away the fact that PWEC and APS have always been separate companies required by the Commission's rules to operate at arm's length. Even accepting the implicit assertion that altruistic PWCC has thus far eschewed rational profit maximization with its unregulated PWEC assets (contrary to management's fiduciary responsibility to shareholders), the matter at issue is not the prudence of PWCC's investment decisions in PWEC. The transaction before the Commission in this proceeding is APS's request that it be allowed to purchase and ratebase these assets *today* in order to recover their costs and returns from present and future ratepayers.

Q: **IN SUMMARY FORM, WHAT ARE YOUR FINDINGS?**

A: I find that approval of APS's request regarding the PWEC assets would be contrary to the public interest for two main reasons. First, APS's request is not consistent with the interests of APS's customers. The ratebasing of PWEC's assets would substantially increase APS's revenue requirement and thus raise rates to customers, without showing commensurate benefits. Second, the proposed transaction would unduly favor APS's affiliate, PWEC, by allowing the transfer of these assets in a manner that amounts to an exercise of market power. The transaction would force APS customers to bear risks that PWEC is now apparently unwilling to bear, the magnitude of which are uncertain because APS has failed to objectively evaluate the suitability of the PWEC assets for APS's future needs.

Q: **PLEASE EXPLAIN YOUR FINDINGS.**

A: I find that APS's request is economically equivalent to a bail out of PWEC and PWCC at the expense of the electricity customers of APS. It is clear that at least near-term prices paid by customers will be higher with the ratebasing of PWEC's assets than with acquisition of any net power needs on the open market. APS argues that the future portends higher prices on the open market than ratebasing PWEC's assets will yield. Presented as a virtual certainty, this assertion is speculation and contradicted by APS's very request in this proceeding – i.e., if future higher prices on the open market dominate lower prices over the nearer term, PWCC's financial interests would lie in leaving PWEC unregulated, not in transferring the plants to APS.

What APS's proposal here amounts to is a request that the Commission compel customers to pay a very high insurance payment (in the form of elevated prices paid to APS to cover the return on and of PWEC's capital) year-on-year for some twenty years. This insurance policy makes no sense for customers. PWCC's conduct in making the current proposal indicates that the economics it foresees do not support such an insurance policy, and consumers have better alternatives (including forward purchasing of power by APS).

Ownership of the PWEC assets will result in APS having considerably more capability to generate energy than it requires for its system operations for many years into the future. As a consequence, APS's proposal to ratebase the PWEC assets amounts to asking APS's customers to go into the business of selling power on the open wholesale power market – a business that PWCC is now apparently unwilling to continue with PWEC's assets.

It is also clear that granting APS's request would harm the competitive wholesale market and thus substantially undermine the extent to which competitors will be able to discipline APS in the future. Granting APS's request will send a clear and chilling signal to all existing and potential competitors in the Arizona power market that the playing field is not level, but is instead tilted substantially in favor of APS, PWEC and PWCC. Approval of the transaction would allow the Company to circumvent the competitive process that has been Commission policy since at least 1999.[6]

APS's witnesses take pains to argue, albeit only generically, that vertical integration of a regulated utility can be efficient and need not be inconsistent with the existence of competitive wholesale power markets. The data reviewed below, however, indicate that APS is asking the Commission to allow it to become one of the most vertically integrated investor-owned utilities in the Western U.S., and to simultaneously allow it to exercise market power by permitting its affiliate PWEC to obtain prices for its power that that are far higher than extant forward market prices which APS has already locked in as part of the recent Track B procurements. APS makes this request without providing any evidentiary assurance that it is in the interest of its Arizona customers, offering instead only unsubstantiated speculation that there will be future savings.

Q: **HOW IS YOUR TESTIMONY STRUCTURED?**

A: In Section III, I first review the public policy issues raised by APS's request and the importance of the Commission's role in reviewing this affiliate transaction. Thereafter, I discuss the economics of the transaction with a focus on how it will impact APS's Arizona customers. In particular, I examine evidence surrounding the development of the PWEC assets as merchant electricity generation facilities. Finally, in Section IV, I discuss the merits of APS's claim that its proposal for greater vertical integration results in a guarantee of more reliable service in the future without creating future regulatory challenges for the Commission.

III. PUBLIC POLICY IMPLICATIONS OF APS'S PROPOSED PURCHASE OF THE PWEC ASSETS

III.A The Commission's Role in the Review of APS's Request to Ratebase the PWEC Assets and Abrogate the Track B Contracts.

Q: **FROM A PUBLIC POLICY PERSPECTIVE, WHAT IS THE ROLE OF THE COMMISSION IN EVALUATING APS'S PROPOSED RATEBASING OF THE PWEC ASSETS?**

A: The Commission's role is to ensure that APS's proposal is in the public interest, taking into account all relevant facts and circumstances. Because most APS ratepayers lack effective direct access to competitive power suppliers,[7] they rely on the Commission to protect them from bad business decisions and exercises of market power by their power supplier, APS. When a monopoly utility acquires assets on behalf of its captive ratepayers and seeks to place those assets into its ratebase, the

[6] See, e.g., Decision Number 65154, September 10, 2002 at page 23.

[7] This does not appear to be in dispute. See, e.g., Direct Testimony of Gordon at Page 9, esp. fn 6.

Commission properly investigates whether the acquisition was a good business decision at the time it was made. Evaluating such acquisitions normally involves investigating whether the assets are needed to provide reliable service to ratepayers, whether the utility's needs could be met more cost-effectively, and whether the utility is paying a fair, competitive price for the assets.

Q: **DO SPECIAL PROBLEMS ARISE WHEN A MONOPOLY UTILITY COMPANY SUCH AS APS ACQUIRES ASSETS FROM AN AFFILIATE?**

A: Yes. In the case where a regulated monopoly utility such as APS is acquiring assets from an affiliated company such as PWEC, the Commission must also guard against the possibility that the transaction represents an exercise of market power by the utility. When a utility purchases goods or services from an affiliated company, the utility has an incentive to pay its affiliate more than the prevailing market price if it believes it has a reasonable prospect of managing the ratemaking process so as to pass the higher costs on to ratepayers. Regulators have long recognized this incentive; and policies to guard against such "vertical market power" include proscriptions on affiliate transactions (e.g., forced divestiture of generation assets), as well as codes of conduct specifying rules for affiliate transactions. These typically require that utilities pay no more than the competitive market price when they purchase goods and services from their affiliates. In this case, APS is attempting to recover the (depreciated) cost of the PWEC assets with no demonstration of their market value.

Q: **DOES THE COMMISSION REGULATE TRANSACTIONS BETWEEN UTILITIES AND THEIR AFFILIATES?**

A: Yes. I understand the Commission has rules governing affiliate interest issues (incl. A.A.C. R14-2-401, *et seq.*). These were designed to "ensure that ratepayers do not pay rates for utility service that include costs associated with holding company structure, financially beleaguered affiliates, or sweetheart deals with affiliates intended to extract capital from the utility to subsidize non-utility operations."[8] As a part of its industry restructuring efforts, the Commission has required utilities to issue and follow Codes of Conduct, which among other things, prevent preferential treatment of affiliated companies. The Commission's Orders in various restructuring dockets have also reiterated the Commission's concerns about and intolerance for preferential treatment or sweetheart deals between a utility and its affiliates.[9]

Q: **HAS THE FERC PROMULGATED ADDITIONAL REGULATIONS ON THESE ISSUES?**

A: Yes. With respect to an intra-corporate transfer of an asset between a utility and its affiliate, for example, to satisfy the public interest standard under Section 203 of the

---

[8] Commission's Concise Explanatory Statement, In the Matter of the Notice of Proposed Adoption of Rules for Regulation of Public Utility Companies with Unregulated Affiliates, Decision 56844, Attachment B at 2 (1990).

[9] See, e.g., Decision 61973 at 10 (1999) ("We share the concerns that the non-competitive portion of APS not subsidize the spun-off competitive assets through unfair financial arrangement."); Decisions 62416 and 62767 (2000) (adopting APS and TEP Codes of Conduct); Decision 65154 at 29-30 (2002) (requiring additional provisions in Codes of Conduct to cover utilities and affiliates in energy-related fields); Decision 65743 at 76, 78-79 (2003) ("We want to make clear that any preferential or discriminatory activity by APS, its parent or affiliates that interferes with a fair, unbiased solicitation process, whether specifically delineated or not in the standards of conduct, the Codes of Conduct, or this Decision, will not be tolerated, and that we will closely scrutinize the solicitation process for signs of any such abuse."; directing additional Staff reports be filed on utility Codes of Conduct); Decision 65796 at 39,40 (2003) (As a condition to approving APS's financing application re: the PWEC assets, requiring APS and PWEC to comply with all Affiliated Interest Rules and directing a preliminary inquiry into APS's compliance with its Code of Conduct).

Federal Power Act, FERC has required parties to demonstrate that the purchase and sale is on terms similar to any other available competitive alternatives.[10]

Q: **HAVE YOU CONSIDERED THESE FACTORS IN YOUR ANALYSIS?**

A: Yes. My analysis of APS's ratebasing proposal looks at the economics of the proposal and the extent to which the proposal is congruent with the stated regulatory objectives of the Commission. As I have indicated, with respect to economic impacts, I in part rely on the Testimony of Mr. Tranen, which offers a dissection of various costs associated with the acquisition of the PWEC assets. I also translate these impacts into a framework that makes clear what these impacts mean for consumers. Additionally, I analyze how the proposal stands to benefit APS's shareholder PWCC at the expense of APS's ratepayers.

III.B APS's Ratebasing Proposal Fails the Public Interest Standard from an Economic Standpoint.

Q: **PLEASE DESCRIBE APS'S PROPOSED TREATMENT OF THE PWEC ASSETS.**

A: APS proposes to purchase the PWEC assets at their current book value and to place them into APS's rate base. APS requests that the costs associated with the PWEC assets, including return of and on capital, operations and maintenance expenses, property taxes, and other items be included in APS's test year revenue requirement. As Mr. Tranen reports, APS's proposal would increase APS's test year revenue

[10] See, e.g., Ameren Energy Co, 103 FERC ¶61, 128 (2003); Boston Edison Company Re: Edgar Electric Energy Co., 55 FERC ¶61,382 (1991). APS and PWEC have not sought FERC approval for the proposed transfer of the PWEC assets. As proposed and supported in this filing, the transaction would not appear to meet a standard of competitive comparability, at least from the perspective of sound economic analysis.

requirement by almost $115 million or 65% of APS's total proposed revenue requirement increase.[11]

Q: **DOES APS ASSERT THAT BUYING THE PWEC ASSETS AND COMMITTING CUSTOMERS TO PAY FOR THEM IS IN THE PUBLIC INTEREST?**

A: Yes. APS's witnesses present a number of arguments to support its claim that the transaction is in the public interest. The general theme of these arguments is that the transaction will make ratepayers better off because it will protect them from future shortages and volatility in the competitive power market. APS claims that ratepayers will benefit because ratebasing the plants will lead to greater off-system sales margins. Further, according to Dr. Hieronymus, unless the Commission allows APS to buy the plants from PWEC, nothing will prevent PWEC from selling the assets' output at market prices to other buyers once the Track B contracts expire and the market is once again purportedly in a state of shortage. For example, Dr. Hieronymus states:

> "PWEC would face the same opportunities in export markets as would other generators and power marketers. A profit maximizing PWEC would not sell to APS for less than it could receive elsewhere, particularly having twice offered its capacity to APS's customers at cost-of-service prices and been turned down."[12]

In a nutshell, APS is telling the Commission that PWEC is offering to sell the assets at a cost-of-service price now, because they have an "APS centric" frame of mind; but if the Commission does not capitalize on this last chance, APS customers

[11] Mr. Wheeler testifies that APS is seeking higher annual revenues of approximately $175 million, of which $115 million is 65%. Wheeler Direct Testimony at Page 3: 4-6.

will surely be disappointed when the wholesale market turns against them in the future. In that purported future of shortages and price spikes, Dr. Hieronymus seems to be averring, PWEC will no longer be "APS centric". Indeed, elsewhere, Dr. Hieronymus indicates that PWEC can be expected to go so far as to exercise market power against APS and its customers if and when tight market conditions return.[13]

Q: **WHAT EVIDENCE DOES APS PRESENT THAT SUCH FUTURE TIGHT CONDITIONS AND PRICE SPIKES WILL IN FACT OCCUR?**

A: None. APS's assertion that the market will not provide adequate resources in the long term is based wholly on conjecture. For example, Dr. Hieronymus offers testimony regarding his predictions of conditions in the wholesale market after 2006, when the Track B Contracts end. According to Dr. Hieronymus:

> "Western power markets will cease to be in surplus, most likely between 2005 and 2008. My best estimate is for 2007."[14]
>
> "My expectation [is] of a near-shortage and price spike in the latter half of the decade . . . essentially at the same time that the Track B contracts will expire…."[15]
>
> It would be "folly" to "requir[e] that APS commit to replace the contracts and buy needed new supply to meet load growth from the market when its current Track B contracts expires at the end of 2006."[16]

According to Dr. Hieronymus, it is because of this "likely tightening" of Western power markets that it would be "quite risky in terms of reliability, prices, and price volatility" for APS to rely on the market for the capacity that rate-basing these

---

[12] Hieronymus Direct Testimony at Page 64:15-18.
[13] Hieronymus Direct Testimony at Page 64:19-21.
[14] Id. at Page 9:11-14.
[15] Id. at Page 9: 20-22.

[PWEC assets] would cover."[17] In other words, based on this speculative "analysis" of power markets after 2006, Dr. Hieronymus concludes that ratebasing the PWEC assets "is likely to be cost-effective, relative to purchasing from the competitive wholesale market, for APS."[18]

Q: **HAVE YOU ANALYZED APS'S CLAIM THAT THE PROPOSED PURCHASE PRICE IS A GOOD DEAL FOR RATEPAYERS?**

A: Yes. The Commission, as well as the customers who pay APS's regulated rates, would be justified in expressing skepticism at the Company's characterization of its proposal as charitable or magnanimous. As Dr. Hieronymus says: "A profit maximizing PWEC would not sell to APS for less than it could receive elsewhere."[19] Notwithstanding Dr. Hieronymus' assertions to the contrary, sound regulatory policy appropriately views PWEC as a profit maximizing company. Presumably, PWEC is no less "profit maximizing" today than it will be in 2007. This is reasonable and appropriate, since PWEC used shareholder money from PWCC to build the assets and has a fiduciary responsibility to PWCC and its shareholders.

Dr. Hieronymus' testimony is contradicted by PWEC's apparent willingness to sell the PWEC assets to APS at book value. PWEC would presumably violate its fiduciary responsibilities to its shareholder PWCC if it sold the PWEC assets or their output to APS (or to any other entity) at less than market price, regardless of whether the transaction takes place today or in 2007. If PWEC believes that power prices will

---

16 Id. at Page 50: 16-18.

17 Id. at Page 65: 8-10.

18 Id. at Page 10:3-4.

19 Id. at Page 64: 16-17.

spike beginning around 2007, that the PWEC assets will then be able to make large profits, and that the present value of those future higher price conditions outweighs present value of lower prices in the nearer term, then PWEC would reasonably expect these future profits to be reflected in the current value of the assets. It would be harming its shareholder PWCC if it sold them for anything less than that. On the other hand, APS's shareholder (also PWCC) will benefit if APS pays more than market price for the assets and then is able to recover the ratebased costs by raising the rates it charges its customers. It is reasonable to conclude selling the PWEC assets to APS and ratebasing them is a good deal for its shareholder PWCC, meaning that the proposed sales price is unlikely to be *less* than PWEC's view of the assets' market value.

APS offers no evidence to reassure the Commission and customers that the price is not *above* market value. Indeed, in a response to a data request, APS's policy witness Mr. Wheeler asserts that ratebasing the PWEC assets at book value should occur even if there are lower-cost alternatives available from credit-worthy third parties.[20]

Dr. Hieronymous can assert to have seen the future, but PWCC's conduct is inconsistent with Dr. Hieronymous' prediction. Ratebasing PWEC's assets is consistent with PWCC's shareholders' interests when the impact on the present value of revenues of expected future prices (appropriately adjusted for the probability that those prices will or will not turn out to be higher by various amounts) is such that the assets are worth *less* if they remain *out of* APS's rate base. This occurs when the effect of higher prices that can be secured by ratebasing the assets outweigh (in present value) the effect of purportedly foregoing higher market prices at some point(s) in the future. But this means, concomitantly, that the negative effect on customers (in present value) of having to commit to paying for the ratebased assets of PWEC and paying higher prices in the nearer term outweighs the effect of the possible impact of prices that are higher by some amounts in the future. In short, PWEC's conduct in seeking ratebasing of its assets is a bad deal for APS's consumers.

Q: **WHAT ABOUT APS'S ARGUMENT THAT IT IS BUYING THE PWEC ASSETS IN ORDER TO PROTECT CONSUMERS AGAINST FUTURE POWER MARKET SHORTAGES?**

A: In economic terms, APS argues that ownership of the PWEC assets would provide APS's customers with a form of insurance against future power market shortages. Ratebasing the PWEC assets purportedly would protect APS's customers from such shortages because, in exchange for committing to make large annual payments to APS, they would buy power from the PWEC assets at cost-of-service instead of market prices.

It is particularly important to understand what APS is arguing here. As noted, APS repeatedly asserts that, thus far, PWEC has eschewed rational profit-maximizing strategies and forgone opportunities to capture market price spikes (e.g., during 2000-01).[21] This, it asserts, reflects its "APS centric" focus and willingness to sacrifice its

---

[20] See Exhibit JPK-2, Wheeler Discovery Response AzCPA 1-107.

[21] See note 4 above.

shareholder PWCC's interests in "the bottom line."[22] Yet now, APS is effectively threatening that the next time market prices spike, PWEC will not be so nice. Rather, it will ride the market and visit the full force of the price spikes it purportedly foresees on APS's customers.[23]

Q: **WHETHER THIS THREAT IS EMPTY OR NOT, DO YOU BELIEVE THAT IT IS IN APS'S CUSTOMERS' INTERESTS TO "BUY" THE INSURANCE THAT RATEBASING IMPLIES?**

A: No. Insurance inherently involves committing to payments certain to be incurred in order to avoid the impact of otherwise uncertain payments. Notwithstanding risks that may otherwise be borne in an uncertain world, it is not always in a consumer's interests to buy insurance, especially when the price of insurance is high relative to the risks. In this regard, it is folly to treat speculation (e.g., by Dr. Hieronymus) of a price spike in 2007 as a certainty and to argue, therefore, that customers would be better off committing to ratebase treatment of power purchased from PWEC. In fact, as I have discussed, APS's conduct in seeking to get PWEC's assets into ratebase and away from the risks of relying on the marketplace suggests that the "insurance" that APS is offering is a good deal for the sole shareholder of APS and PWEC, PWCC, and therefore likely a bad deal for customers.

Q: **HAVE YOU ANALYZED THE TRANSACTION USING THE "INSURANCE" FRAMEWORK YOU JUST DISCUSSED?**

---

22 Direct Testimony of Hieronymus at Page 26:11-13.

23 See, e.g., Direct Testimony of Hieronymus at Page 50:21-23.

A: Yes. Using this framework, I have prepared Exhibit JPK-3. This Exhibit illustrates the nature of the long-term commitment to paying APS that is implied by ratebasing of PWEC's assets. In the Exhibit, the insurance payment reflected is the annual commitment by customers (attendant to ratebasing) associated with covering both return of and on capital for the PWEC assets. As shown in Exhibit JPK-3, this payment ranges from approximately $160 million to approximately $40 million per year in nominal terms over the next twenty years, or slightly more than $1 billion in present value terms.[24] In the near years — 2004-2006 – this payment commitment makes APS's proposed rates much higher than they would be if the Company instead relied on the Track B Contracts.

This cost disparity should alarm customers, especially since APS's filing provides no quantitative support to show that this insurance policy is cost-effective for APS's customers. As I have discussed above, serving PWCC's shareholders' interests by ratebasing PWEC's assets indicates that the insurance policy PWCC is offering is *not* cost-effective on a net present value basis for consumers. Not only does the Company's conduct indicate that customers do not need this insurance; even if the insurance were needed, it has not been demonstrated that other forms of insurance are available more cheaply from other providers (such as various options that APS has previously purchased through the Track B process). The alternative to this insurance policy, particularly using the forward market as a means of satisfying

[24] Exhibit JPK-3 presents annual costs including only depreciation and return on undepreciated ratebase grossed up to account for income taxes. For purposes of taking this present value, I have employed a 10% discount rate. This rate is conservative relative to other rates that the ACC applies to various consumers' funds when it requires utilities to pay customers interest on their deposits. These interest

expected future demand, is already providing benefits through the Track B Contracts. To ask APS customers to pay for after-the-fact insurance, and throw out reliance on forward purchase contracts, is nonsensical. As I have found in my recent studies,[25] and Mr. Tranen discusses in his testimony, there is no reason to doubt that the forward market can provide adequate supplies. Moreover, APS's January 27, 2004 Summary of Responses Received to its Power Supply Resource Request for Proposals Dated December 3, 2003 indicates that nine entities submitted a total of thirteen bids in response to APS's request for future power supplies.

III.C APS's Proposal Would Put Its Customers in the Merchant Power Business.

Q: **PLEASE EXPLAIN HOW APS'S CUSTOMERS WILL INCUR MORE RISK IF APS BUYS THE PWEC ASSETS AND PLACES THEM IN ITS RATE BASE.**

A: Placing the PWEC assets in APS's rate base will shift the market risk associated with the PWEC assets from PWEC's shareholder PWCC to APS's customers. Having decided it no longer desires to bear this merchant risk itself, PWEC is attempting to off-load the risk onto APS's customers.

As Mr. Tranen's Exhibit JDT-7 shows, in acquiring the assets APS would enormously increase the amount of power it has available for off-system sales during

---

rates range from 0.77% to 10%. See tariffs of APS, Tucson Electric Power, Ajo Gas Service, Duncan Rural Services Corp., and Southwest Gas Corp.

[25] See, for example, Prepared Direct Testimony of Joseph P. Kalt, Ph.D., October 17, 2002, Federal Energy Regulatory Commission Docket Nos. EL02-60-003 and EL02-62-003, and Prepared Direct Testimony of Joseph P. Kalt, Ph.D., October 8, 2002, Federal Energy Regulatory Commission Docket Nos. EL02-80-003, *et al*, Direct Testimony, June 28, 2002, and Prepared Answering Testimony,

those months when it is already at or above its capacity requirements. Similarly, Exhibit JPK-4 shows that the PWEC assets would make APS annually, on net, a large net *seller* of capacity and energy in the wholesale market. Mr. Wheeler testifies that the benefits of these off-system sales will flow through to ratepayers through lower rates. However, the magnitude of these future benefits is small in the test year and highly speculative in future years. Conversely, the increased cost to APS's ratepayers resulting from ratebasing the PWEC assets is immediate, substantial and ongoing for years. In fact, the Company's filing only offers a limited test-year quantitative analysis of these off-system sales benefits (which Mr. Tranen shows are quite small relative to the insurance payment customers would have to commit to under ratebasing (see Exhibit JDT-2)) and does not make the case that these benefits would off-set the year-on-year commitment to increased costs that ratepayers would incur as a result of rate-basing the PWEC assets. Mr. Wheeler also neglects to point out the downside — that if off-system sales do not materialize, the losses associated with the unused excess capacity would also flow through to APS ratepayers.

Q: **ARE YOU SAYING THAT THE RISKS ASSOCIATED WITH THESE SPECULATIVE BENEFITS ARE MORE APPROPRIATELY BORNE BY PWEC'S SHAREHOLDER, PWCC?**

A: Yes. From a public policy perspective, PWCC should bear this risk because it chose to make the investment in the PWEC assets and stood to gain if it had turned out to be profitable. My analysis of documents relevant to this proceeding leads me to

---

August 27, 2002, of Joseph P. Kalt, PhD., in Federal Energy Regulatory Commission Docket No. EL02-26-000, *et al.*

conclude that PWCC built the PWEC assets as merchant investments with the expectation that their output could be sold profitably at market prices. While, as noted above, APS takes pains to now assert that PWEC's *intention* has been to eschew the bottom line and serve APS's customers' interests at PWCC's (and PWCC's shareholders') expense, this proposition lacks credibility because it is inconsistent with the public policy expectation that unregulated firms will be profit maximizing.

I find no evidence that PWEC expected or desired to sell the plants' output to APS at anything other than market prices or to place them in rate base prior to the market turning so soft after 2000. Further, the terms of the 1999 Settlement stipulated that PWEC would sell to APS at market prices.[26] Mr. Wheeler indicates that, during the Track B proceeding, APS fully expected PWEC to offer power service to APS at nothing less than the wholesale market price.[27]

APS is petitioning the Commission for preferential treatment that amounts to a "heads I win, tails you lose" bargain. Consider the arguments PWCC and PWEC would make if the Commission attempted to force PWEC to sell the plants or their output to APS at cost-of-service prices if the present value of PWEC's assets implied by those cost-of-service prices were *lower* than the market value of the assets under continued market pricing. PWCC and PWEC (or, at least, PWCC's shareholders if they were properly informed) would rightly be expected to argue that such an action by the Commission would be tantamount to an illegal taking of shareholder property.

---

[26] APS Settlement Agreement, May 14, 1999 at page 7.

[27] See Exhibit JPK-2, Wheeler Discovery Response AzCPA 1-110 and AzCPA 1-112.

Q: **IS THERE EVIDENCE THAT APS IS AWARE THAT THE TRANSACTION WOULD TRANSFER MARKET RISK FROM PWEC TO APS'S CUSTOMERS?**

A: Yes. For example, PWEC planning documents from June 2001 include an analysis of four scenarios for sales from the PWEC assets. One of the dimensions analyzed was the amount of market risk PWEC would face under each scenario. In the scenario where PWEC sells its output at market prices, the company's market risk is "high." In the scenario where the assets are covered under full cost of service ratemaking, PWEC's market risk is "nil." See Exhibit JPK-5.

Q: **IN ADDITION TO THIS RISK TRANSFER, ARE THERE OTHER BENEFITS PWCC AND PWEC WOULD GAIN FROM THE TRANSFER?**

A: Yes. PWCC and PWEC would be able to exit investments that they no longer expect to be profitable. At the time PWCC built the PWEC assets, it believed the plants would be able to make high profits by selling into California. See Exhibit JPK-6. PWCC explained its investment decisions as being based on policy changes in the western markets. To capture these profits, PWCC sited the PWEC assets on key transmission lines. See Exhibit JPK-6.

Q: **WHAT CHANGED?**

A: The enormous increase in merchant power investment in Arizona and the west generally has led to a glut in capacity and thereby made the PWEC assets much less valuable. As Exhibit JPK-7 shows, during the planning stages, PWEC expected these assets to run at very high levels of output. When its analyses showed high plant values, PWEC apparently did not consider either a cost-of-service contract or ratebase treatment for the assets. To the contrary, PWEC explicitly counted on being able to make sales at competitive wholesale prices.[28] See Exhibit JPK-6. Today, as Exhibit JPK-7 shows, PWEC's planning documents show expectations that the plants will run only at a fraction of what was originally expected. It is as if a company built a factory expecting it to operate at 70-80% of its capacity utilization and now finds it operating at much lower level of capacity utilization, which severely impacts its expected future operating margins.

Q: **HAVE YOU FOUND EVIDENCE THAT PWEC HAS CONSIDERED THIS SITUATION?**

A: Yes. Exhibit JPK-8 is an excerpt of an analysis carried out in mid-2001 which shows that PWEC realized that, following price declines in the wholesale market, (see Exhibit JPK-9), a better approach for it to ensure stable earnings from the PWEC assets was to move them into the APS rate base, a scenario it referred to as "re-regulation."

Q: **FROM A PUBLIC POLICY PERSPECTIVE, IS IT SOUND ECONOMICALLY FOR THE COMMISSION TO APPROVE TRANSFERRING THESE MERCHANT GENERATION RISKS FROM PWEC SHAREHOLDERS TO APS'S CONSUMERS?**

---

28 The actual arrangements for selling output for the PWEC assets varied over time given various changes PWCC made to its corporate structure. Initially PWCC set-up a marketing and trading business unit which was responsible for disposing of the PWEC assets' capacity (PWEC is primarily responsible for insuring the plants operate reliably). Eventually PWCC placed responsibility for the marketing and trading of the PWEC assets' output into a different unregulated APS affiliate called APS Marketing and Trading. See Exhibit JPK-2, Discovery Responses LCA 4-97 and 4-98.

A: No. APS is requesting that the Commission sanction a significant transfer of risk from PWEC's shareholder PWCC to APS customers. As I discuss below, this, in effect, constitutes a request to exercise market power. PWCC made a clearly documented business decision to enter the merchant energy sector through the creation of PWEC and the construction and acquisition of various power assets. PWCC is now attempting to significantly reduce its exposure to the merchant sector by selling some of its assets to APS. APS's filing does not address this transfer of risk to customers and does not in any way demonstrate that this transfer is in the customers' interest.

III.D The PWEC Assets Are Merchant Plants.

Q: **APS SUPPORTS ITS PROPOSAL BY CLAIMING THAT THE PWEC ASSETS WERE BUILT TO SERVE APS'S RATEPAYERS. DOES THIS CONTENTION HAVE ANY BEARING ON THIS APPLICATION?**

A: No. This argument is a red herring. Documents produced in discovery and presented in Exhibit JPK-6 show that the PWEC assets were planned and constructed based on wholesale market expectations, not expectations of being part of the APS rate base. And, as noted, the terms of the 1999 Settlement stipulated that PWEC would sell to APS at market prices.

Q: **APS ASSERTS THAT RATEBASING IS APPROPRIATE BECAUSE THE PWEC ASSETS WERE BUILT EXPRESSLY TO SERVE APS'S NATIVE LOAD AND WITH THE EXPECTATION THAT THEY WOULD BE**

COMBINED WITH EXISTING APS GENERATION RESOURCES. DO YOU AGREE?

A: No. APS's argument appears to be that raising consumer prices by ratebasing the assets is fair, because PWEC built the assets with the subjective *intention* of serving APS's consumers. However, APS does not claim that the PWEC assets were built with the intent of serving APS's customers on a cost-of-service basis, or placing the assets in rate base. Furthermore, although Mr. Wheeler argues that the PWEC assets were built with the expectation that they would be combined with APS generation to create a highly competitive asset portfolio, Mr. Bhatti's testimony demonstrates that PWEC expected that the new generation, on a stand alone basis, would yield very high returns from sales at expected market prices. It was apparently not until the middle of 2001 that PWEC began to consider the extent to which a softening wholesale market may be rendering its initial profitability estimates for these assets inaccurate.[29] As shown in Exhibit JPK-9, PWEC's desire to reduce its exposure to the wholesale market came only after wholesale prices had collapsed.

Q: **IS THERE OTHER EVIDENCE THAT SUPPORTS THE PROPOSITION THAT THE PWEC ASSETS WERE BUILT AS MERCHANT PLANTS?**

A: Yes. The huge energy surplus that would result from including the PWEC assets in the APS rate base suggests that had the investment decisions really been made on an "APS centric" basis, PWEC would have invested in lower-cost simple-cycle combustion turbines that would have been sufficient to meet the APS's capacity requirements while avoiding the need to rely upon market energy sales to justify the higher capital costs of combined-cycle units.

Based on these observations and my analysis of discovery documents in this case, I conclude that the PWEC assets were intended to serve the western wholesale market. As the western market comprises Arizona, then APS's ratepayers are included in this market. The car dealer sometimes says that: "This car was built for you." Economically, what this means is: "I ordered this car because I knew you (or people like you) would be likely to buy it from me at a price that would be profitable." In summary, it is irrelevant whether PWEC's decision to build plants was based in part on expected load growth in Arizona or on the hope that the PWEC assets would be combined in a generation portfolio with deregulated APS generation. PWEC understood that the plants' output was to be sold at market prices rather than through cost of service rates and analyzed the decision to build these plants on a stand-alone basis.

IV. REGULATORY IMPACT OF APS'S PROPOSAL ON CURRENT COMMISSION OBJECTIVES

IV.A APS is Already Vertically Integrated and Making It More So by Ratebasing the PWEC Assets Is Inconsistent with Competitive Market Development.

Q: **PLEASE ADDRESS APS'S EXPRESSED INTENT TO INCREASE ITS "VERTICAL INTEGRATION" BY ACQUIRING THE PWEC ASSETS.**

[29] I also note that Exhibit JDT-9 shows the extent to which PWEC underestimated the amount of new capacity that would be built in the Western U.S. Given this now-observed change in supplies, the capacity utilization levels shown in Exhibit JPK-7 are hardly surprising.

A: APS's witnesses claim that increasing APS's vertical integration through acquisition of the PWEC assets is beneficial to customers.[30] Acquisition of the PWEC assets would unquestionably make APS much more vertically integrated, and thereby decrease its reliance on the competitive market for future resource procurement. In fact, if APS buys the PWEC assets it will be one of the two most vertically integrated utilities in the WECC. Further, APS is already "vertically integrated" at an above-average level when compared with other electric utilities in the WECC. See Exhibit JPK-10. Given these facts, APS's generic assertions that some vertical integration can be efficient do not establish that the increased vertical integration associated with ratebasing the PWEC assets is in the best interest of customers, especially given the negative impacts it will have on the development of competitive wholesale markets.

IV.B APS's Proposal Is an Attempt to Exercise Market Power.

Q: **PLEASE EXPLAIN THE RISK OF VERTICAL MARKET POWER.**

A: Regulators and economists have long recognized that a regulated utility with market power in one sector of the energy industry (e.g., distribution) would have both the incentive and possibly the opportunity (through manipulation of the rate-making process) to use that monopoly to extract rents from competitive sectors (e.g., generation). For example, as APS's expert, Dr. Gordon, and a co-author have written:

> "Vertical market power, a leading concern in the regulation of utilities and their affiliates, refers to the possibility that a firm can exercise its horizontal market power at one stage of the production process (such as transmission or distribution) to influence price and output at another

[30] See, e.g., Wheeler Direct Testimony, Page 12: 22:25.

> stage, such as generation and retail sales, or in new markets...the principal vertical market power concern in the industry has been that integrated transmission and distribution owners would use their control of bottleneck facilities to favor sales of their own generation over sales of their competitors."[31]

Q: HAVE UTILITY REGULATORS EXPRESSED CONCERN ABOUT VERTICAL MARKET POWER?

A: Yes. Concerns about vertical market power have been central to most of the efforts to promote competition in power and gas markets. For example, the FERC has recently issued new rules on codes of conduct for gas and electricity transmission providers specifically intended to prevent the exercise of vertical market power by transmission providers.

> "9. The Commission is concerned that a Transmission Provider's market power could be transferred to its affiliated businesses because the existing rules do not cover all affiliate relationships. For example, an integrated entity could exercise market power in delivered natural gas service to raise costs of rival generators or inhibit entry of new generators into wholesale power markets."[32]

In addition, in calling for renewed attention to both affiliate and non-affiliate transactions, the Chairman of the FERC has recently voiced particular concern about "the acquisition of temporarily distressed generation assets by the local utilities that would otherwise be buying under long-term contract."[33]

---

[31] Kenneth Gordon and Charles Augustine, "Fostering Efficient Competition in the Retail Electric Industry: How Can Regulators Help Solve Vertical Market Power Concerns? First, Do No Harm." Prepared for the Edison Electric Institute, August 1998.

[32] Standards of Conduct for Docket No. RM01-10-000 Transmission Providers ORDER NO. 2004 FINAL RULE (Issued November 25, 2003), slip. op., at 6.

[33] See Exhibit JPK-2, attached as Comments of FERC Chairman Pat Wood during Merrill Lynch Conference Call, January 26, 2004 at page 13.

Q: PLEASE EXPLAIN WHY APS'S PROPOSAL CONSTITUTES AN ATTEMPTED EXERCISE OF MARKET POWER.

A: It is a textbook case. Economically, APS's proposal is a proposal to pay higher-than-market prices to PWEC over at least the near term and raise rates in present value terms to get its customers to pay the costs and assume the risks of PWEC's merchant power business. Competition is defined as price-taking – the competitive firm takes market prices as given and supplies accordingly; it lacks the power to unilaterally control the price and push higher prices onto consumers. Thus, as a matter of straightforward economics, PWEC's ability to realize higher-than-market prices at any time going forward by putting the PWEC assets in APS's rate base arises because doing so enables PWEC to utilize APS's regulated status to allow it to exercise market power. If it was not exercising market power, PWEC would not be able to realize above-market prices. This ability arises from PWEC's vertical relationship under ratebasing, coupled with APS's status as a local regulated utility whose rates are not being set by competition. That is, APS's ability to pass higher-than-market wholesale prices emanating from the ratebasing of PWEC's assets reflects the fact that APS is not a price taking, competitive seller at the retail level. The ability to make, rather than take, retail prices is not surprising. As APS acknowledges:

> "[APS's r]etail customers can, in principle, choose to take service from a competitive provider, although few (if any) competitors are offering retail service in Arizona at the present time."[34]

If its retail prices were being set by the discipline of competition, APS would not be able to pass higher-than-competitive-market wholesale prices from PWEC onto the APS retail customers. And if APS thereby were unable to pass what are effectively higher-than-competitive-market PWEC prices at wholesale onto retail consumers, PWCC would not benefit from ratebasing the PWEC assets.

Q: **HOW DO YOU RESPOND TO DR. HIERONYMUS' TESTIMONY THAT THE COST-EFFECTIVENESS OF APS'S ACQUISITION OF THE PWEC ASSETS, RELATIVE TO THE WHOLESALE MARKET, IS IRRELEVANT TO THE COMMISSION'S RULING ON APS'S REQUEST?[35]**

A: I strongly disagree. The Commission has stated that it expects APS to apply least cost planning principles in acquiring new generation.[36] These principles require a comparison of APS's proposal to market-based alternatives. It is clear that APS has failed to adequately assess and analyze the cost-effectiveness of its proposal as compared to market alternatives, notwithstanding the fact that the Commission requires this analysis.

Q: **WHY IS THIS ANALYSIS SO CRITICAL TO THE COMMISSION'S REVIEW OF APS'S PROPOSAL?**

A: Overseeing a regulated utility's acquisition of resources on behalf of its customers, with the intent of recovering the cost of those assets from its customers, is a fundamental role of the Commission. Recognizing that inter-affiliate transactions could be a source of ratepayer harm, regulators (including the Commission) and

---

[34] Direct Testimony of Gordon at Page 9, fn. 10.

[35] Direct Testimony of Hieronymus at Page 51: 16-20.

[36] Decision 65743 at 75 (2003).

economists have found that careful analysis of such transactions is critical for ensuring ratepayers are protected.

The current proceeding is an opportunity for the Commission to prevent such an abuse. If the Commission approves APS's request to shift cost and risk from shareholders to ratepayers, and ratepayers actually enjoy economic benefits (which, as I have shown, is inconsistent with the evidence of APS's conduct), the Commission should not be surprised to find APS before it at a later date with a new proposal that would attempt to transfer the merchant cost and risk back to shareholders to recapture these benefits.

IV.C APS's Proposal Would Harm the Competitive Market.

Q: **IS THE IMPACT OF APS'S RATEBASING PROPOSAL ON THE COMPETITIVE WHOLESALE MARKET RELEVANT TO THE COMMISSION'S DECISION-MAKING?**

A: Yes. APS's ratepayers stand to benefit substantially from an efficient and well-functioning wholesale market in Arizona and the west generally. These benefits are provided in a number of ways. First, availability of wholesale providers gives APS important options for procuring resources to meet its growing load. Absent the wholesale market, APS would have no choice but to own sufficient generation capacity to meet its entire load. Further, the presence of competitive providers acts as a discipline on the costs and the behavior of a regulated company such as APS. This is true even if APS retains its effective monopoly in serving retail customers in its service territory.

Q: DO YOU AGREE WITH APS'S WITNESSES' TESTIMONY TO THE EFFECT THAT APS'S PROPOSAL IS CONSISTENT WITH THE COMMISSION'S STATED POLICY OF SUPPORTING COMPETITIVE WHOLESALE POWER MARKETS?[37]

A: No. The Commission should take no comfort from these assurances. To the contrary, it must be recognized that the Commission's action in this matter is likely to have a material effect on the future development of wholesale competition in Arizona. Approving APS's request would send a clear signal to potential investors in future projects that Arizona is not a level playing field.

Q: PLEASE EXPLAIN HOW APPROVAL OF APS'S PROPOSED TREATMENT OF THE PWEC ASSETS WOULD HAVE A "CHILLING EFFECT" ON WHOLESALE POWER MARKETS.

A: As described above, at the time the PWEC assets were built, PWEC expected, and the regulatory framework was designed, to sell those assets' output at competitive wholesale market prices. In this regard, the PWEC assets are no different from other merchant power plant investments that have been made in the west and throughout the country. Now, PWEC is attempting to transfer the risks and costs of these assets to ratepayers—an option that doesn't exist for other merchant investors in Arizona. If the rate basing request is approved, other market participants will have been denied a fair opportunity to compete with PWEC. Such preferential treatment will signal the market that the playing field is not level. Going forward, this will adversely impact current and future investors' expectations and willingness to participate in the

---

[37] See, e.g., Gordon Direct Testimony, Page 20:3:7

wholesale marketplace. As the Chairman of the FERC recently pointed out, conduct of the form that APS requests here "take[s] players out of the competitive market and the wholesale market, and they make that market thereby thinner and weaker as a consequence."[38]

V. CONCLUSION

Q: PLEASE SUMMARIZE YOUR CONCLUSIONS.

A: I find that APS is asking the Commission to sanction an enormous transfer of risk and costs from PWEC's shareholder PWCC to APS's ratepayers. APS attempts to characterize this transfer as a high-minded action by PWCC to give up the opportunity to make high profits from the PWEC assets so that customers can be protected from future power market shortages and provided with bountiful supplies of excess power to sell at high prices. The Commission should reject APS's proposal. Allowing APS to buy the PWEC assets would harm customers by forcing them to accept the costs and risks of merchant investments that, had they been profitable, would have benefited PWCC, not customers. In its economic essentials and impacts, this is a case of a regulated utility attempting to game the regulatory process in a manner that harms customers and enriches shareholders.

Q: DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY IN THIS CASE?

A: Yes.

---

[38] See Exhibit JPK-2, attached as Comments of FERC Chairman Pat Wood during Merrill Lynch Conference Call, January 26, 2004 at page 29.

Exhibit JPK-1

JOSEPH PEGGS KALT
John F. Kennedy School of Government
Harvard University
Cambridge, MA 02138
(617) 495-4966

PROFESSIONAL EXPERIENCE

JOHN F. KENNEDY SCHOOL OF GOVERNMENT, HARVARD UNIVERSITY, CAMBRIDGE, MA
Ford Foundation Professor of International Political Economy, 1992 - present

> Areas of specialization include Industrial Organization, Economics of Antitrust and Regulation, Natural Resource Economics, Public Choice and Political Economy, Microeconomic Theory.

Member, Standing Committee on Higher Degrees in Political Economy and Government, 2002 - present
Faculty Chair, Interfaculty Initiative, Harvard University Native American Program, 2000 - present
Co-Director, The Harvard Project on American Indian Economic Development, 1987 - present
Chair, Economics and Quantitative Methods Cluster, 1995 - 2000
Professor of Political Economy, 1986 - 1992
Faculty Chair and Academic Dean for Research, 1992 - 1994
Chairman, Environment and Natural Resources Program, Center for Science and International Affairs, 1990 - 1994
Chairman of Degree Programs, 1990 - 1992
Chairman of Ph.D. Programs, 1989 - 1990
Assistant Director for Natural Resources, Energy and Environmental Policy Center, 1985 - 1990
Co-Director, Harvard Study on the Future of Natural Gas Policy (with Frank C. Schuller), Energy and Environmental Policy Center, John F. Kennedy School of Government, 1984-86

LEXECON INC, AN FTI COMPANY (AND PREDECESSOR CONSULTING ENTERPRISES)
Senior Economist, 2003 – present (and since 1983 with predecessor enterprises)

DEPARTMENT OF ECONOMICS, HARVARD UNIVERSITY, CAMBRIDGE, MA
Associate Professor of Economics, 1983 - 1986
Assistant Professor of Economics, 1980 - 1983
Instructor in Economics, 1978 - 1980

> Taught Economics of Antitrust and Regulation, Intermediate Microeconomics, and Principles of Economics.

PRESIDENT'S COUNCIL OF ECONOMIC ADVISERS, WASHINGTON DC
Junior Staff Economist, 1974 - 75

Analyzed federal energy, environmental, transportation, and tax policies.

EDUCATION

University of California, Los Angeles
Ph.D. in Economics, 1980
Dissertation: "Federal Control of Petroleum Prices: A Case Study of the Theory of Regulation"
M.A. in Economics, 1977

Stanford University, Stanford, CA
B.A. in Economics, 1973

EXPERT TESTIMONY

TTX Company
Before the Surface Transportation Board, Finance Docket No. 27590 (Sub-No.3), Application for Approval of Polling Of Car Service With Respect to Flatcars. January 5, 2004.

Chevron U.S.A. Inc.
In the District Court, 17th Judicial District, Parish of LaFourche, LA, Chevron U.S.A. Inc. v. State of Louisiana, Louisiana State Mineral Board, and Louisiana Department of Natural Resources. Expert Report, November 21, 2003; Supplemental Expert Report, January 9, 2004.

Motiva Enterprises, LLC, Shell Oil Company, Shell Oil Products Company, LLC, and Equiva Trading Company
Superior Court, Complex Litigation Docket at Waterbury, Wyatt Energy, Inc., v. Motiva Enterprises, LLC, Shell Oil Company, Shell Oil Products Company, LLC (as successor to Shell Oil Company), and Equiva Trading Company. Expert Report, November 20, 2003.

The Burlington Northern & Santa Fe Railway Company
In the United States District Court for the Northern District of California, San Francisco Division, Truck-Rail Handling, Inc. and Quality Transport, Inc. v. The Burlington Northern & Santa Fe Railway Company. Expert Witness Report, August 18, 2003; Supplemental Expert Witness Report, September 22, 2003; Deposition, September 25, 2003.

Shell Oil Company, Shell Western E&P, Inc., Shell Cortez Pipeline Company, Kinder Morgan CO_2 Company, L.P., Mobil Oil Corporation, Mobil Producing Texas and New Mexico, Inc., and Cortez Pipeline Company

Before the District Court, County of Montezuma, State of Colorado, Celeste C. Grynberg, individually and as trustee on behalf of the Rachel Susan Trust, the Stephen Mark Trust, and the Miriam Zela Trust; and Jack J. Grynberg v. Shell Oil Company, Shell Western E&P, Inc., Shell Cortez Pipeline Company, ExxonMobil Corporation formerly known as Mobil Oil Corporation, Mobil Producing Texas and New Mexico, Inc., Cortez Pipeline Company, Kinder Morgan CO_2 Company, L.P. formerly known as Shell CO_2 Company, Ltd., and John Does 1-10 Whose True Names Are Unknown. Affidavit, June 12, 2003; Expert Report, June 20, 2003; Supplemental Expert Report, August 15, 2003; Deposition, December 2, 2003; Affidavits, January 6, 2004; Affidavit, January 22, 2004.

Dex Holdings, LLC

Before the Washington Utilities and Transportation Commission, In the Matter of the Application of Qwest Corporation Regarding the Sale and Transfer of Qwest Dex to Dex Holdings, LLC. Rebuttal Testimony, April 17, 2003; Oral Testimony, May 23, 2003.

Amerada Hess Corporation

First Judicial District, State of New Mexico, County of Santa Fe, Patrick H. Lyons, Commissioner of Public Lands of the State of New Mexico, Trustee, v. Amerada Hess Corporation. Second Supplemental Expert Report, April 7, 2003; Deposition, May 8, 2003.

Department of Defense Jet Fuel Contract Litigation, *In the United States Court of Federal Claims,* declarations in various individual cases, December 2002-present.

SDDS, Inc.

In the Circuit Court, Sixth Judicial District, SDDS, Inc., v. State of South Dakota. Affidavit in Support of Motion in Limine, December 23, 2002; Affidavit, January 17, 2003; Expert Report, February 24, 2003; Expert Report, April 25, 2003; Deposition, May 13, 2003; Oral Testimony, July 2, 2003, July 11, 2003; Oral Rebuttal Testimony, July 17, 2003; Affidavit, October 22, 2003.

Mardi Gras Transportation System Inc.

United States of America, Before the Federal Energy Regulatory Commission, Caesar Oil Pipeline Company, LLC. Affidavit, December 5, 2002.

United States of America, Before the Federal Energy Regulatory Commission, Proteus Oil Pipeline Company, LLC. Affidavit, December 5, 2002.

Powerex Corp.

Before the American Arbitration Association, In the Matter of an International Commercial Arbitration Between Powerex Corp., formerly British Columbia Power Exchange Corporation, and Alcan Inc., formerly Alcan Aluminum Limited. Expert Report, November 20, 2002; Oral Testimony, December 12, 2002.

Texaco Inc., Texaco Exploration and Production Inc., Texaco Trading and Transportation Inc.
In the District Court, 19th Judicial District, Parish of East Baton Rouge, LA, State of Louisiana and Secretary of the Department of Revenue and Taxation v. Texaco Inc.; State of Louisiana and Secretary of the Department of Revenue and Taxation v. Texaco Exploration and Production Inc.; State of Louisiana and Secretary of the Department of Revenue and Taxation v. Texaco Trading and Transportation Inc. Expert Report, November 11, 2002.

Ticketmaster Corporation
United States District Court, Central District of California, Tickets.com, Inc., v. *Ticketmaster Corporation and Ticketmaster-Online Citysearch, Inc.* Rebuttal Expert Report, November 8, 2002; Deposition, November 20, 2002.

The Burlington Northern & Santa Fe Railway Company
In the United States District Court for the Western District of Texas, Austin Division, South Orient Railroad Company, Ltd., v. The Burlington Northern & Santa Fe Railway Company and Union Pacific Railway Company. Expert Witness Report, October 30, 2002; Deposition, November 15, 2002.

El Paso Merchant Energy, L.P.
United States of America before the Federal Energy Regulatory Commission, Public Utilities Commission of the State of California, California Electricity Oversight Board v. Sellers of Long-Term Contracts to the California Department of Water Resources, Sellers of Energy and Capacity Under Long-Term Contracts with the California Department of Water Resources. Prepared Direct Testimony, October 17, 2002; Rebuttal Testimony, November 14, 2002; Deposition, November 24, 2002; Oral Testimony, December 10, 2002; Prepared Reply Testimony, March 20, 2003.

ExxonMobil
United States Department of the Interior, Board of Land Appeals, Appeal of July 2, 2001 Decision; Request for Value Determination Regarding the Arm's-Length Nature of a Gas Sales Contract. Affidavit, October 8, 2002.

El Paso Merchant Energy, L.P.
United States of America, Before the Federal Energy Regulatory Commission, PacifiCorp v. Reliant Energy Services, Inc., Morgan Stanley Capital Group Inc., Williams Energy Marketing & Trading Company, El Paso Merchant Energy L.P. Prepared Direct Testimony, October 8, 2002; Prepared Rebuttal Testimony, November 26, 2002; Deposition, December 5, 2002; Oral Testimony, December 18, 2002.

Oxy USA, Inc.
In the Twenty-Sixth Judicial District, District Court, Stevens County, Kansas, Civil Department, Opal Littell, Cherry Rider, and Bonnie Beelman vs. Oxy USA, Inc. Expert Witness Report, October 7, 2002; Expert Witness Rebuttal Report, October 29, 2002; Oral Testimony, April 8, 2003.

Shell Western E & P Inc., Shell Gas Trading Company, and Shell Oil Company

United States District Court, 112th Judicial District, Crockett County, TX, Minnie S. Hobbs Estate, et al., v. Shell Western E & P Inc., Shell Gas Trading Company, and Shell Oil Company. Expert Report, August 28, 2002; Deposition, December 14, 2002; Supplemental Expert Report, August 1, 2003; Affidavit, August 20, 2003; Oral Testimony, October 7, 2003.

Conoco Inc. and Phillips Petroleum Company

United States District Court for the Northern District of Oklahoma, Transeuro Amertrans Worldwide Moving and Relocations Limited vs. Conoco Inc. and Phillips Petroleum Company. Affidavit, August 21, 2002; Oral Testimony, September 17, 2002.

Conoco Inc., Amoco Production Company, and Amoco Energy Trading Corp.

United States District Court for the District of New Mexico, Elliott Industries Limited Partnership v. Conoco Inc., Amoco Production Company, and Amoco Energy Trading Corp. Expert Report, July 1, 2002; Affidavit, July 6, 2002; Deposition, August 13, 2002.

El Paso Merchant Energy, L.P. and Calpine Energy Services, L.P.

United States of America, Before the Federal Energy Regulatory Commission, Nevada Power Company and Sierra Pacific Power Company v. Duke Energy Trading and Marketing, L.L.C., Enron Power Marketing, Inc., El Paso Merchant Energy, L.P., American Electric Power Services Corp.; Nevada Power Company v. Morgan Stanley Capital Group Inc., Calpine Energy Services, L.P., Mirant Americas Energy Marketing, L.P., Reliant Energy Services, Inc., BP Energy Company, Allegheny Energy Supply Company, L.L.C.; Southern California Water Company v. Mirant Americas Energy Marketing, L.P.; Public Utility District No. 1 , Snohomish County, Washington, v. Morgan Stanley Capital Group Inc. Prepared Direct Testimony, June 28, 2002; Prepared Answering Testimony, August 27, 2002; Deposition, September 24, 2002.

CFM International, Inc.

United States District Court for the Central District of California, Western Division, Aviation Upgrade Technologies, Inc., v. The Boeing Company, CFM International, Inc., and Rolls Royce plc. Expert Report, June 28, 2002.

Elkem Metals Company and CC Metals & Alloys, Inc.

Before the United States International Trade Commission, Ferrosilicon from Brazil, China, Kazakhstan, Russia, Ukraine, and Venezuela, Remand Proceedings. Affidavit, May 23, 2002; Oral Testimony, June 6, 2002.

Amoco Production Company

In the District Court, La Plata County, Colorado, Richard Parry, Linda Parry, Evelyn L. Payne and David Groblebe, et al., v. Amoco Production Company. Expert Report, May 1, 2002; Oral Testimony, August 29, 2002.

Chevron U.S.A., Conoco, and Murphy Exploration & Production Company

In the United States Court of Federal Claims, Chevron U.S.A., Inc.; Conoco Inc.; and Murphy Exploration & Production Company v. United States of America. Expert Report, May 1, 2002.

British Columbia Lumber Trade Council and the Province of British Columbia

In the Matter of Certain Softwood Lumber Products from Canada (C-122-839), International Trade Administration, U.S. Department of Commerce. "Log Export Restraints, Price 'Gaps,' and the Transmission of Softwood Log Price Effects Across Canada," December 12, 2001; "Response to Reports of Stoner and Mercurio Dated January 2002," January 16, 2002.

American Quarter Horse Association

In the 251st District Court, Potter County, Texas, Kay Floyd, et al., v. American Quarter Horse Association. Affidavit, October 30, 2001; Expert Report, February 1, 2002.

Amoco Production Company, Amerada Hess Corporation, Shell Western E&P, Inc., Shell Land & Energy Co.

First Judicial District, State of New Mexico, County of Santa Fe, Ray Powell, Commissioner of Public Lands of the State of New Mexico, Trustee, v. Amoco Production Company, Amerada Hess Corporation, Shell Western E&P, Inc., and Shell Land & Energy Co. Expert Report, September 21, 2001; Deposition, November 7, 2001; Supplemental Expert Report, January 31, 2002.

Shell Oil Company

Montana Sixteenth Judicial District Court, Fallon County, Fidelity Oil Company v. Shell Western E & P, Inc., and Shell Oil Company. Expert Report, September 7, 2001.

Anne E. Meyer and Mary E. Hauf, et al., v. Shell Western E & P, Inc., and Shell Oil Company. Rebuttal Report, September 7, 2001.

Fran Fox Trust, et al., v. Shell Western E & P, Inc., and Shell Oil Company. Rebuttal Report, September 7, 2001.

Marvel Lowrance and S-W Company v. Shell Western E & P, Inc., and Shell Oil Company. Rebuttal Report, September 7, 2001.

El Paso Merchant Energy, L.P.

United States of America before the Federal Energy Regulatory Commission, Public Utilities Commission of the State of California v. El Paso Natural Gas Company, El Paso Merchant-Gas, L.P., and El Paso Merchant Energy Company. Prepared Direct Testimony, May 8, 2001; Oral Testimony, May 29-30, Oral Rebuttal Testimony, June 6-8, 2001; Oral Surrebuttal Testimony, June 19, 2001; Prepared Rebuttal Testimony, March 11, 2002; Oral Testimony, March 26-27, 2002.

Teléfonos de Mexico

In the United States District Court for the Western District of Texas, San Antonio Division, Access Telecom, Inc., v. MCI Telecommunications Corp., MCI International, Inc., SBC Communications, Inc., SBC International, Inc., SBC International Latin America, Inc., and Teléfonos de Mexico. Expert Report, January 22, 2001; Supplement to the Expert Report, February 14, 2001; Deposition, February 22, 2001.

Compaq Computer Corporation

In the United States District Court for the Eastern District of Texas, Beaumont Division, Charles Thurmond, Hal LaPray, Tracy D. Wilson, Jr., and Alisha Seale Owens vs. Compaq Computer Corporation. Opinion, December 15, 2000; Deposition, January 4, 2001.

American Airlines

In the Matter of the United States Department of Justice v. AMR Corporation. Expert Report, October 11, 2000; Deposition, October 31-November 1, 2000; Supplemental Expert Report, November 16, 2000; Revised Supplemental and Rebuttal Expert Report, December 4, 2000; Deposition, December 14-15, 2000; Declaration, January 5, 2001; Declaration, March 14, 2001.

Tosco Corporation

In the United States District Court for the District of Hawaii, Carl L. Anzai, Attorney General, for the State of Hawaii, As Parens Patriae for the Natural Persons Residing in Hawaii, and on behalf of the State of Hawaii, its Political Subdivisions and Governmental Agencies, vs. Chevron Corporation, et al. Expert Report, October 23, 2000; Deposition, January 8-9, 2001; Supplemental Report, April 16, 2001; Deposition, April 24, 2001.

Phillips Petroleum Company, GPM Gas Corporation, Phillips Gas Marketing Company, Phillips Gas Company, and GPM Gas Trading Company

In the District Court of Fort Bend, Texas, 268th Judicial District, Kathryn Aylor Bowden, Beulah Poorman Vick, Omer F. Poorman, and Monte Cluck vs. Phillips Petroleum Company, GPM Gas Corporation, Phillips Gas Marketing Company, Phillips Gas Company, and GPM Gas Trading Company. Deposition, August 1, 2000; Oral Testimony at class certification hearing, September 8, 2000.

Exxon Corporation, Shell Oil Company, and Union Oil Company of California

In the United States District Court for the Eastern District of Texas, Lufkin Division, J. Benjamin Johnson, Jr., and John M. Martineck, Relators, Bringing this Action on Behalf of the United States of America, vs. Shell Oil Company, et al. Expert Report on behalf of Exxon Corporation, June 16, 2000.

In the United States District Court for the Eastern District of Texas, Lufkin Division, United States of America ex rel. J. Benjamin Johnson, Jr., and John M. Martineck vs. Shell Oil Company, et al.. Expert Reports on behalf of Shell Oil Company and Union Oil Company of California, June 16, 2000; deposition on behalf of Shell Oil Company, August 8-11, 2000.

Exxon Company, U.S.A.

Before the Hearing Officer of the Taxation and Revenue Department of the State of New Mexico, In the Matter of Protest to Assessment No. EX-001. Expert Report, April 17, 2000.

Government of Canada

In the Matter of an Arbitration Under Chapter Eleven of the *North American Free Trade Agreement: Between Pope & Talbot, Inc., and The Government of Canada.* Affidavit, March 27, 2000; Second Affidavit, April 17, 2000; Oral Testimony, May 2, 2000.

BP Amoco, PLC, and Atlantic Richfield Company

In the United States District Court for the Northern District of California, San Francisco Division, Federal Trade Commission vs. BP Amoco, PLC, and Atlantic Richfield Company. Expert Report, March 1, 2000; Deposition, March 7, 2000.

Burlington Northern Santa Fe

Before the Surface Transportation Board, STB Ex Parte No. 582, Public Views on Major Rail Consolidations. Statement (with Amy Bertin Candell), February 29, 2000.

Before the Surface Transportation Board, STB Ex Parte No. 582 (Sub-No. 1), Public Views on Major Rail Consolidations. Verified Statement (with José A. Gómez-Ibáñez), November 17, 2000; Verified Rebuttal Statement (with José A. Gómez-Ibáñez), January 11, 2001.

Te Ohu Kai Moana (Treaty of Waitangi Fisheries Commission)

In the High Court of New Zealand, Auckland Registry, between Te Waka Hi Ika O Te Arawa and Anor, and Treaty of Waitangi Fisheries Commission and ORs; between Te Runanganui O Te Upoko o Te Ika and ORS, and Treaty of Waitangi Fisheries Commission and ORS (Defendants); between Ryder and ORS, and Treaty of Waitangi Fisheries Commission and ORS; between Te Kotahitanga O Te Arawa Waka and ORS, and Treaty of Waitangi Fisheries Commission and ORS. Affidavit, February 4, 2000.

American Petroleum Institute

Before the United States of America Department of the Interior Minerals Management Service, Further Supplementary Proposed Rule for Establishing Oil Value for Royalty Due on Federal Leases. Declaration (with Kenneth W. Grant), January 31, 2000.

Amoco Production Company and Amoco Energy Trading Corporation

In the First Judicial District Court, County of Santa Fe, State of New Mexico, The Florance Limited Company, The M.J. Florance Trust No. 2, and The Florence A. Florance Trust vs. Amoco Production Co. and Amoco Energy Trading Corporation. Expert Report, December 15, 1999; Deposition, January 11-12, 2000.

Reliant Technologies, Inc.

In the U.S. District Court, Northern District of California/Oakland Division, Reliant Technologies, Inc., vs. Laser Industries, Ltd., and Sharplan Lasers, Inc. Expert Report, October 15, 1999; Deposition, December 2-3, 1999.

El Paso Natural Gas Company

In the District Court of Dallas County, Texas, Transamerican Natural Gas Corporation vs. El Paso Natural Gas Company, Meridian Oil, Inc., Burlington Resources Inc., Richard M. Bressler, Travis H. Petty, William A. Wise, Oscar S. Wyatt, The Coastal Corporation, and Coastal Oil and Gas Corporation. Expert Report, September 24, 1999; Deposition, September 28, 1999; Affidavit, November 19, 1999.

Exxon Corporation

Before the Superior Court, State of California, Los Angeles, In the Matter of the People of the State of California, City of Long Beach, et al., v. Exxon Corporation, et al. Deposition, May 11-12, 19, 1999; Oral Testimony, July 22-23, 26-29, 1999.

AIMCOR, American Alloys, Inc., Elkem Metals Company, and SKW Metals & Alloys, Inc.

Before the United States International Trade Commission, In the Matter of Ferrosilicon from Brazil, China, Kazakhstan, Russia, Ukraine, and Venezuela. Oral Testimony, April 13, 1999.

El Paso Energy Corporation and El Paso Tennessee Pipeline Co.

EPEC Gas Latin America, Inc., and EPEC Baja California Corporation, Plaintiffs, v. Intratec S.A. de C.V. and Intratec Resource Co., L.L.C., Defendants and Third Party Plaintiffs, v. El Paso Energy Corporation and El Paso Tennessee Pipeline Co., Third Party Defendants. Expert Report, March 26, 1999.

Bass Enterprises Production Company

Bass Enterprises Production Company, et al., v. United States of America, Assessment of Bass Enterprises Production Company's and Enron Oil and Gas Company's Economic Losses Arising from the Temporary Taking of Oil and Gas Lease. Expert Report, March 19, 1999; Deposition, May 13, 1999; Oral Testimony, October 24-25, 2000; Supplemental Expert Report, June 11, 2001; Deposition, June 30, 2001; Oral Testimony, July 23-24, 2001.

Government of Canada

Before the Arbitration Panel Convened Pursuant to Article V of the Softwood Lumber Agreement Between The Government of Canada and The Government of the United States of America, Canada-United States Softwood Lumber Agreement: In the Matter of British Columbia's June 1, 1998 Stumpage Reduction. Economic Report, March 12, 1999.

Elkem Metals Company, L.P. and Elkem ASA

In the United States District Court for the Western District of Pennsylvania, Bethlehem Steel Corporation vs. Elkem Metals Company, L.P., and Elkem ASA. Expert Report, December 9, 1998; Deposition, March 26-27, 1999.

Shell Oil Company and Shell Western E&P, Inc., Mobil Producing Texas and New Mexico, Inc., and Cortez Pipeline Company

In the United States District Court, District of Colorado, United States Government and CO_2 Claims Coalition, LLC, vs. Shell Oil Company and Shell Western E&P, Inc., Mobil Producing Texas and New Mexico, Inc., and Cortez Pipeline Company. Expert Report, November 23, 1998; Deposition, January 11-12, 1999; Affidavit, January 21, 1999; Supplemental Expert Report, April 30, 1999; Second Supplemental Expert Report, March 30, 2001.

American Alloys, Inc., Globe Metallurgical, Inc. and Minerais U.S. Inc.

In re Industrial Silicon Antitrust Litigation: Civil No. 95-2104, before the United States District Court, Western District of Pennsylvania. Oral Testimony, November 2, 1998.

Group of Oil Company Defendants

In re: Lease Oil Antitrust Litigation No. II, MDL No. 1206, before the United States District Court, Southern District of Texas, Corpus Christi Division. Deposition, September 28, October 15, 1998; Affidavit, October 8, 1998.

Rockwell International Corporation and Rockwell Collins, Inc.

In the United States District Court for the District of Arizona, Universal Avionics Systems Corporation, an Arizona corporation, v. Rockwell International Corporation, a Delaware corporation; Rockwell Collins, Inc., a Delaware corporation. Expert Report, September 15, 1998; Second Expert Report, November 18, 1998; Supplement to September 15, 1998, Expert Report, July 30, 1999; Supplement to November 18, 1998, Amended Second Expert Report, July 30, 1999; Deposition, September 22-23, 1999.

American Alloys, Inc., Globe Metallurgical, Inc., Minerais U.S. Inc., and SKW Metals and Alloys, Inc.

In re Industrial Silicon Antitrust Litigation: Civil No. 95-2104, before the United States District Court, Western District of Pennsylvania. Daubert Testimony, September 14, 1998.

Texaco, Inc.

In the Matter of Texaco Inc., et al., v. Duhe, et al., Before the United District Court for the Western District of Louisiana. Expert Report (with Kenneth Grant), June 30, 1999.

In the matter of John M. Duhe, Jr., et al. v. Texaco Inc., et al., Before the 16th Judicial District Court, Parish of Iberia, State of Louisiana. Oral Testimony, March 2, 1999.

In the Matter of Long, et al., v. Texaco, Inc., et al., Before the United States District Court for the Middle District of Louisiana. Expert Report (with Kenneth Grant), August 14, 1998; Deposition, October 2-3, 1998.

Honeywell, Inc.

In the matter of Litton Systems, Inc., v. Honeywell Inc., before the United States District Court, Central District of California, Case No. CV-90-4823 MPR (EX), Report on

Assessment of Litton's Antitrust Damages, August 3, 1998; Deposition, August 24-26, 1998; Oral Testimony, December 2-4, 1998.

North West Shelf Gas Project

In the Matter of an Arbitration Between Western Power Corporation and Woodside Petroleum Development Pty. Ltd. (ACN 006 325 631), et al. First Statement, May 6, 1998; Second Statement, May 15, 1998; Third Statement, July 22, 1998; Oral Testimony, July 22-28, 1998.

Northern Natural Gas Company

United States of America before the Federal Energy Regulatory Commission, In the Matter of Northern Natural Gas Company. Prepared Direct Testimony, May 1, 1998.

Association of American Railroads

Market Dominance Determinations—Product and Geographic Competition, Before the Surface Transportation Board. Joint Verified Statement (with Robert D. Willig), May 29, 1998; Reply Verified Statement (with Robert D. Willig), June 29, 1998.

Review of Rail Access and Competition Issues, Before the Surface Transportation Board. Joint Verified Statement (with David Reishus), March 26, 1998; Oral Testimony, April 3, 1998.

Exxon Corporation and Affiliated Companies

In the United States Tax Court, Exxon Corporation and Affiliated Companies v. Commissioner of Internal Revenue. Rebuttal Report, February 19, 1998.

Exxon Company

Before the United States of America Department of the Interior Minerals Management Service, Review of the Federal Royalties Owed on Crude Oil Produced from Federal Leases in California. Affidavit, February 17, 1998.

Elkem Metals Company, L.P.

In Re Industrial Silicon Antitrust Litigation and Related Cases, In the United States District Court for the Western District of Pennsylvania. Expert Report, January 9, 1998; Deposition, February 5-6, 1998.

TransCanada Gas Services Limited

Paladin Associates, Inc., et al., v. Montana Power Company, et al., In the United States District Court for the District of Montana. Expert Report, November 19, 1997; Expert Rebuttal Report, December 22, 1997; Deposition, January, 1998; Affidavit May 19, 1998.

Koch Pipeline Company, L.P.

In the Matter of CF Industries, Inc. v. Koch Pipeline Company, L.P., Before the Surface Transportation Board. Verified Statement (with Amy B. Candell), November 10, 1997; Deposition, December 12, 1997; Reply Verified Statement, January 9, 1998; Rebuttal Verified Statement, February 23, 1998.

Phillips Petroleum Company

In the Matter of Canyon Oil & Gas Co. v. Phillips Petroleum Company, Before the United States District Court. Expert Report (with Kenneth Grant), September 30, 1997.

Union Oil Company of California and Shell Oil Company

Review of the Federal Royalties Owed on Crude Oil Produced from Federal Leases in California. Expert Report, June 30, 1997; Supplemental Report, July 28, 2000.

CSX Corporation and CSX Transportation, Inc., Norfolk Southern Corporation and Norfolk Southern Railway Company

Before the Surface Transportation Board. Direct Testimony June 12, 1997; Rebuttal Verified Statement, December 15, 1997.

Williams Production Company et al.

San Juan 1990-A, L.P., K&W Gas Partners, L.P., Map 1992-A Partners, L.P. and the Board of Trustees of Leland Stanford Junior University v. Williams Production Company and John Doe, in the First Judicial District, County of Santa Fe, State of New Mexico. Affidavit, August 29, 1997.

San Juan 1990-A, L.P., K&W Gas Partners, L.P., Map 1992-A Partners, L.P. and the Board of Trustees of Leland Stanford Junior University v. El Paso Production Company, Meridian Oil Inc., and John Doe, in the First Judicial District, County of Santa Fe, State of New Mexico. Second Affidavit, February 7, 2000.

Pro Se Testimony

In the Matter of United States of America, Department of the Interior, Minerals Management Service, Establishing Oil Value for Royalty Due on Federal Leases, and on Sale of Federal Royalty Oil. Comments, May 27, 1997; Supplemental Comments (with Kenneth W. Grant), August 4, 1997.

Group of Oil Company Defendants

In the Matter of Doris Feerer, et al. v. Amoco Production Company., et al., In the United States District Court for the District of New Mexico. Expert Report, May 5, 1997; Supplemental Expert Report, July 14, 1997; Deposition, December 4-5, 1997.

Pennsylvania Power & Light Company

Before the Pennsylvania Public Utilities Commission. Direct Testimony, April 1, 1997; Rebuttal Testimony, August 1997.

Honeywell, Inc.

In the Matter of Litton Systems, Inc., v. Honeywell Inc., before the United States District Court, Central District of California, Case No. CV-90-0093 MRP, Preliminary Expert Report, March 7, 1997.

Crow Indian Tribe

Rose v. Adams in the Crow Tribal Court, Montana, Report Concerning the Crow Tribe Resort Tax (with David Reishus), November 27, 1996; Testimony, January 23, 1997; Surrebuttal Report (with David Reishus), February 25, 1997; Report (with David Reishus), March 31, 2000.

Exxon Corporation

In the Matter of Allapattah Services, Inc., et al. v. Exxon Corporation, U.S. District Court for the Southern District of Florida. Affidavit, November 25, 1996; Expert Report, January 22, 1997; Deposition, September 22 and November 11, 1998; Expert Report, April 15, 1999; Deposition, May 3-4, 1999; Affidavit, May 16, 1999; Affidavit, June 6, 1999; Deposition, July 12, 1999; Daubert Testimony, July 15-17, 1999; Oral Testimony, August 24-25, 1999; Oral Testimony, February 6, 7, 8, 12, 2001.

Public Service Company of New Hampshire

Testimony on market power and antitrust issues before the *New Hampshire Public Utilities Commission,* January 21, 1997.

Group of Oil Company Defendants

In the Matter of Carl Engwall, et al. v. Amerada Hess Corp., et al., Fifth Judicial District Court, County of Chaves, State of New Mexico. Deposition, November 1-2, December 6, 1996; Testimony in class certification proceeding, January 16-17, 1997.

Fond du Lac Band of Chippewa Indians

In the Matter of Fond du Lac Band of Chippewa Indians, et al. v. Arne Carlson, et. al., U.S. District Court, District of Minnesota, Fourth Division. Report, December 4, 1996; Supplemental Report, December 20, 1996.

Group of Oil Company Defendants

In the Matter of Laura Kershaw, et al. v. Amoco Production Co., et al., District Court of Seminole County, State of Oklahoma. Deposition, November 5 and December 6, 1996.

Northeast Utilities

Direct Testimony before the State of New Hampshire Public Utilities Commission, Electric Industry Restructuring (with Adam B. Jaffe), October 18, 1996.

Pro Se Testimony

United States of America before the Federal Energy Regulatory Commission Alternatives to Traditional Cost-of-Service Ratemaking for Natural Gas Pipelines, Regulation of Negotiated Transportation Services of Natural Gas Pipelines (with Adam B. Jaffe), May 30, 1996.

Burlington Northern Santa Fe

Before the Surface Transportation Board In the Matter of Union Pacific Corp., Union Pacific RR Co. and Missouri Pacific RR. Co. -- Control and Merger -- Southern Pacific Rail Corp., Southern Pacific Trans. Co., St. Louis Southwestern RW, Co. SPCSL Corp., and the Denver and Rio Grande Western Corp. Verified Statement, April 27, 1996; Deposition, May 14,

1996. Merger Oversight Proceeding, Verified Statement, July 8, 1998; Verified Statement, October 16, 1998.

Exxon Corporation

Before the Department of Revenue, State of Alaska, In the Matter of Exxon Corporation & Affiliated Companies. Rebuttal Report, April 29, 1996; Deposition, May 21, 1996; Pre-filed Expert Testimony, August 26, 1996; Hearing Testimony, March 10-11, 1997.

Burlington Northern Railroad Company

Before the Surface Transportation Board In the Matter of Burlington Railroad Company -- Crossing Compensation -- Omaha Public Power District. Verified Statement, April 1996.

Pennzoil Company

Lazy Oil Co., et al. v. Witco Corporation, et al. Expert Report, January 29, 1996; Deposition, March 1996.

Yavapai-Prescott Indian Tribe

Yavapai-Prescott Indian Tribe v. Harold Scott (Director of Revenue, State of Arizona), et al. Declaration, June 27, 1995; Second Declaration, August 10, 1995.

State of Michigan

Before the Court of Claims, State of Michigan, Carnagel Oil Associates, et al., v. State of Michigan, The Department of Natural Resources, et al; Miller Brothers, et al., v. State of Michigan, The Department of Natural Resources, et al. Deposition, May 30, 1995.

Northeast Utilities

Before the Massachusetts Department of Public Utilities, In the Matter of Electric Industry Restructuring (rulemaking proceeding). Testimony, April and June 1995.

Burlington Northern Railroad Company

Before the Interstate Commerce Commission In the Matter of Burlington Northern Railroad Company -- Control and Merger -- The Atchison, Topeka and Santa Fe Railway Company, Washington, DC. Verified Statements, October 1994 and April/May 1995.

Northern Natural Gas Pipeline Co.

United States of America before the Federal Energy Regulatory Commission In the Matter of Northern Natural Gas Pipeline Co. (rate filing). Filed Testimony, March 1995.

Houston Lighting and Power Company

Before the Public Utility Commission of Texas, In the Matter of Houston Lighting and Power Company (rate proceeding). Filed Testimony, September, December 1994, and February 1995.

Esso Standard Oil Company (Puerto Rico)

Esso Standard Oil Company (Puerto Rico), et al. v. Department of Consumer Affairs, Commonwealth of Puerto Rico in Federal District Court, Puerto Rico. Deposition, April, 1994. Testimony, July-August, 1994.

Atlantic Richfield Corp., Exxon U.S.A., Inc., and British Petroleum, Inc.

In the Superior Court for the State of Alaska, First Judicial District at Juneau, In the Matter of ANS Royalty Litigation, Report on Economic Analysis of the Fuel Gas Supply, June 6, 1994. Deposition, October 1994.

Governments of British Columbia and Canada

In the Matter of Certain Softwood Products from Canada, International Trade Administration, United States Department of Commerce, Report for the First Administrative Review. Filed Statement, April 12, 1994.

Southwestern Public Service Company

United States of America before the Federal Energy Regulatory Commission, In the Matter of El Paso Electric Company and Central and South West Services, Inc. Affidavit, February 25, 1994.

Mojave Pipeline Company

United States of America before the Federal Energy Regulatory Commission, In the Matter of Mojave Pipeline Company, Economic Analysis of Public Policy with Respect to Mojave Pipeline Company's Proposed Expansion. Filed Testimony, January 1994.

ARCO Pipe Line Company, Four Corners Pipe Line Company, and ARCO Transportation Alaska, Inc.

United States of America before the Federal Energy Regulatory Commission, In the Matter of Market-Based Ratemaking for Oil Pipelines, Comments in Response to Notice of Inquiry. Statement, January 1994.

Exxon

In Re: Columbia Gas Transmission Corporation, Claims Quantification Proceedings, U.S. Bankruptcy Court. Testimony, July 1993, October 1993.

SAGASCO Holdings Ltd.

Federal Court of Australia, In the Matter of Santos Ltd. acquisition of SAGASCO Holdings Ltd. Filed Testimony, August 1993.

El Paso Natural Gas Company

El Paso Natural Gas Company v. Windward Energy & Marketing, et al. Report, August 1993. Affidavit, September 4, 1993.

PSI Resources, Inc.

Indiana Utility Regulatory Commission, In the Matter of the Proposed Merger between PSI Resources, Inc., PSI Energy, Inc., Cincinnati Gas & Electric Co., and CINergy Corp. Filed Statement, June 1993.

Gulf Central Pipeline Company

Interstate Commerce Commission In the Matter of Farmland Industries, Inc. v. Gulf Central Pipeline Company, et al. Verified Statement, May 1993.

ARCO Pipe Line Company and Four Corners Pipe Line Company

United States of America before the Federal Energy Regulatory Commission, Revisions to Oil Pipeline Regulations Pursuant to the Energy Policy Act of 1992, Comments on the Commission Staff's Proposal. Filed Testimony, May 1993.

White Mountain Apache Tribe

United States Fish and Wildlife Service, U.S. Department of the Interior, In the Matter of the Proposed Endangered Species Act Designation of Critical Habitat for Salix Arizonica (Arizona Willow) on the Fort Apache Indian Reservation. Statement, April 1993.

General Chemical Corporation

Bureau of Land Management, U.S. Department of the Interior, In the Matter of the Proposed Increase in Royalty Rates on Soda Ash. Prepared Statements, February 1993.

Association of American Railroads

Interstate Commerce Commission In the Matter of Ex Parte No. 346 (Sub-No. 28) Rail General Exemption Authority: Export Corn and Export Soybeans. Verified Statement, December 1992.

Coalition of Petroleum Refiners

Office of Hearings and Appeals, U.S. Department of Energy, In the Matter of The Citronelle Exception Relief. Filed Statement, July 1992; Testimony, October 1992, November 1992, December 1992.

Exxon

State of California, et al. v. Standard Oil Co. of California, et al. Deposition, October 1992.

Burlington Northern Railroad Company

American Arbitration Association In the Matter of the Arbitration between Wisconsin Power & Light Company and Burlington Northern Railroad Company and Soo Line Railroad Company. Filed Testimony, August, September 1992.

Atlantic Richfield Company

Don Van Vranken, et al. v. Atlantic Richfield Company. Deposition, February 1992; Testimony, August 1992.

National Council on Compensation Insurance
State Corporation Commission, Commonwealth of Virginia, In the Matter of Revision of Workers' Compensation Insurance Rates. Testimony, April, July 1992.

Governments of British Columbia and Canada
International Trade Administration, U.S. Department of Commerce, In the Matter of Certain Softwood Lumber Products from Canada, Economic Analysis of Canadian Log Export Policy. Filed Statement, February, March, April 1992; Testimony, April 1992, May 1992.

Transcontinental Gas Pipe Line Corporation
United States of America before the Federal Energy Regulatory Commission. Testimony, March 1992.

Atlantic Richfield Company
Greater Rockford Energy and Technology, et al. v. Shell Oil Company, et al. Deposition, December 1991.

Better Home Heat Council
Commonwealth of Massachusetts Department of Public Utilities, In the Matter of the Petition of Boston Gas Company for Preapproval of Supplemental Residential Demand-Side Management Programs. Testimony, June 15, 1991.

British Petroleum and Exxon Corporation
In the Superior Court for the State of Alaska, First Judicial District at Juneau, In the Matter of ANS Royalty Litigation, State of Alaska, et al. v. Amerada Hess, et al. Expert report, April 1991; deposition, June, September 1991; supplemental report, April 1992.

Burlington Northern Company
Interstate Commerce Commission, In the Matter of National Grain and Feed Association v. Burlington Northern Railroad Co., et al. Testimony, May 14, 1991.

Arco Pipe Line Company
Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of ARCO Pipe Line Company, et al. February 1, 1991.

Liberty Mutual Insurance Company
Minnesota Workers' Compensation Insurance Antitrust Litigation, on behalf of Liberty Mutual Insurance Company, et al. Deposition, November 1990.

Misle Bus and Equipment Company
United States of America v. Misle Bus and Equipment Company. Testimony, September 1990.

Northeast Utilities Service Company

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of Northeast Utilities Service Company (Re: Public Service Company of New Hampshire). Testimony, March, July 1990.

Amoco Production Company

The Kansas Power and Light Company, et al., v. Amoco Production Company, et al. Deposition, March 1990 through June 1990.

Esso Standard Oil Company (Puerto Rico)

Esso Standard Oil Company (Puerto Rico) before the Department of Consumer Affairs, Commonwealth of Puerto Rico. Testimony, August 1989, April, May 1990.

Arizona Public Service

Utah International v. Arizona Public Service, et al., an arbitration proceeding, June 1989.

Coalition of Petroleum Refiners

Office of Hearings and Appeals, U.S. Department of Energy, In the Matter of The Citronelle Exception Relief. Testimony, March and July, 1989.

Atlantic Richfield Company

Department of Revenue, State of Alaska, In the Matter of Atlantic Richfield Company and Combined Subsidiaries, Oil and Gas Corporate Income Tax for 1978-1981. Testimony, December 1988.

Santa Fe Industries

Texas Utilities Company and Chaco Energy Company v. Santa Fe Industries, Inc., et al. Deposition, November 1988, March, July 1989.

El Paso Natural Gas

Doyle Hartman v. Burlington Northern, Inc., El Paso Natural Gas Co., et al. Deposition, October 1988.

Honeywell Inc.

MidAmerican Long Distance Company v. Honeywell, Inc. Deposition, August 1988.

Exxon

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of Brokering of Interstate Natural Gas Pipeline Capacity. Testimony, July 1988.

Natural Gas Pipeline Company of America

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of Natural Gas Pipeline Company of America. Testimony, November 1987.

Mojave Pipeline Company

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of Mojave Pipeline Company, et al. Testimony, June, October 1987.

Exxon

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of Columbia Gas Transmission Company. Testimony, April 1987.

Villa Banfi

L. Knife & Sons v. Villa Banfi. Testimony, February, March 1987.

Cities Service Corp.

Office of Hearings and Appeals, U.S. Department of Energy, In the Matter of U.S. Department of Energy v. Cities Service Corporation. Testimony, December 1986, February 1987.

Exxon

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of Texas Eastern Transmission Corp. Testimony, August 1986.

Mobil Oil Corporation

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of Northwest Central Pipeline Corp. Testimony, August 1986.

Bethlehem Steel Corporation

Federal Energy Regulatory Commission, U.S. Department of Energy, In the Matter of ANR Pipeline Co., et al. Testimony, May 1986.

Natural Gas Supply Association

Federal Energy Regulatory Commission, U.S. Department of Energy, Request for Supplemental Comments Re: FERC Order No. 436 and Related Proposed Rulemakings, Old Gas Decontrol, FERC's Block Billing for Pipelines, and the Winners and Losers in Natural Gas Policy. February 25, 1986.

Oil Refiners

Office of Hearings and Appeals, U.S. Department of Energy, In the Matter of MDL-378 Stripper Well Exemption Litigation. Testimony, July, September 1984.

Dorchester Gas Corp.

Office of Hearings and Appeals, U.S. Department of Energy, In the Matter of U.S. Department of Energy v. Dorchester Gas Corporation, on behalf of Dorchester Gas Corp. Testimony, January 1984.

PUBLICATIONS AND RESEARCH: BOOKS AND MONOGRAPHS

Current Issues in Native American Research, editor and co-author of two chapters, Harvard University Native American Program, forthcoming (manuscript, February 2004).

What Can Tribes Do: Strategies and Institutions in American Indian Economic Development, Vol. II, ed. (with Amy L. Besaw and Stephen Cornell) and co-author of one chapter, UCLA American Indian Studies Program, University of California Press, forthcoming 2004.

Native America at the New Millennium (with the research staff of the Harvard Project on American Indian Economic Development), February 2002 (forthcoming book manuscript June 2004).

New Horizons in Natural Gas Deregulation, ed. (with Jerry Ellig) and co-author of two chapters, Greenwood Press, 1995.

What Can Tribes Do? Strategies and Institutions in American Indian Economic Development, ed. (with Stephen Cornell), University of California, 1992.

National Parks for the 21st Century: The Vail Agenda, editor and primary author of the Report of the Steering Committee, National Park Foundation, Chelsea Green Publishing Co., 1992.

Cases in Microeconomics (with Jose A. Gomez-Ibanez), Prentice Hall, 1990.

Drawing the Line on Natural Gas Regulation, ed. (with F. C. Schuller) and author of two chapters, Greenwood-Praeger Press/Quorum Books, 1987.

The FACS/Ford Study of Economic and Business Journalism (with James T. Hamilton), Foundation for American Communications and the Ford Foundation, 1987.

The Economics and Politics of Oil Price Regulation: Federal Policy in the Post-Embargo Era, MIT Press, 1981; paperback edition, 1983.

Petroleum Price Regulation: Should We Decontrol? (with Kenneth J. Arrow), American Enterprise Institute, 1979.

PUBLICATIONS AND RESEARCH: ARTICLES

"Roundtable: Recent Developments in Section 2" (with Arron Edlin, A. Douglas Melamed, and Gary L. Roberts), *Antitrust Magazine,* vol. 18, No. 1, Fall 2003.

"Myths and Realities of Tribal Sovereignty: The Law and Economics of Indian Self-Rule" (with Joseph William Singer), Faculty Research Working Paper Series, John F. Kennedy School of Government, Harvard University, January 2004; and forthcoming in *Current*

Issues in Native American Research (ed. by Joseph P. Kalt, Harvard University Native American Program).

"Seizing the Future: Why Some Native Nations Do and Others Don't" (with Stephen Cornell, Miriam Jorgensen, and Katherine A. Spilde), working paper, Harvard Project on American Indian Economic Development, October 2003.

"One Works, the Other Doesn't: Two Approaches to Economic Development on American Indian Reservations" (with Stephen Cornell), working paper, Harvard Project on American Indian Economic Development, November 2002.

The First Nations Governance Act: Implications of Research Findings from the United States and Canada (with Stephen Cornell and Miriam Jorgensen), Report to the British Columbia Assembly of First Nations, July 2002.

"Public Policy Analysis of Indian Gaming in Massachusetts" (with Kenneth Grant and Jonathan B. Taylor), Faculty Research Working Paper Series #RWP02-019, John F. Kennedy School of Government, Harvard University, May 13, 2002.

"Means-Testing Indian Governments: Taxing What Works" (with Jonathan Taylor), in Richard C. Monk, ed., *Taking Sides: Race and Ethnicity*, McGraw-Hill/Dushkin, 2001.

"Where's the Glue? Institutional and Cultural Foundations of American Indian Economic Development" (with Stephen Cornell), *The Journal of Socio-Economics*, vol. 29, 2000.

"Open Access for Railroads? Implications for a Non-Hub, Congestible Network Industry"(with Amy B. Candell), Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries, May 2000 (unpublished working paper).

"What Tribes Can Do: An Interview with Joseph P. Kalt," *American Indian Report*, March 1999.

"Sovereignty and Nation-Building: The Development Challenge in Indian Country Today" (with Stephen Cornell), *The American Indian Culture and Research Journal*, vol. 22, no. 3, February 1999.

"Making Research Count in Indian Country: The Harvard Project on American Indian Economic Development" (with Manley A. Begay, Jr., and Stephen Cornell), *Journal of Public Service and Outreach*, vol. 3, no. 1, Spring 1998.

"Successful Economic Development and Heterogeneity of Governmental Form on American Indian Reservations" (with Stephen Cornell), in Merilee S. Grindle, ed., *Getting Good Government: Capacity Building in the Public Sector of Developing Countries*, Harvard University Press, 1997.

"Cultural Evolution and Constitutional Public Choice: Institutional Diversity and Economic Performance on American Indian Reservations" (with Stephen Cornell), Faculty Research

Working Paper Series, John F. Kennedy School of Government, January 1995; reprinted in John Lott, ed., *Uncertainty and Economic Evolution: Essays in Honor of Armen A. Alchian*, Routledge Press, 1997.

"Regulatory Reform and the Economics of Contract Confidentiality: The Example of Natural Gas Pipelines" (with A. B. Jaffe, S. T. Jones, and F. A. Felder), *Regulation*, 1996, No. 1.

"Precedent and Legal Argument in U.S. Trade Policy: Do They Matter to the Political Economy of the Lumber Dispute?" in *The Political Economy of American Trade Policy*, Anne O. Krueger, ed., University of Chicago Press, 1996.

"Do Precedent and Legal Argument Matter in the Lumber CVD Cases?" in *The Political Economy of Trade Protection*, Anne O. Krueger, ed., University of Chicago Press, 1996.

"Introduction: The New World of Gas Regulation" (with Jerry Ellig), J. Ellig and J. P. Kalt, eds., *New Directions in Natural Gas Deregulation*, Greenwood Press, 1995.

"Incentive Regulation for Natural Gas Pipelines" (with Adam B. Jaffe), in J. Ellig and J. P. Kalt, eds., *New Directions in Natural Gas Deregulation*, Greenwood Press, 1995.

"Where Does Economic Development Really Come From? Constitutional Rule Among the Modern Sioux and Apache" (with Stephen Cornell), *Economic Inquiry*, Western Economic Association International, Vol. XXXIII, July 1995, pp. 402-426.

"Insight on Oversight" (with Adam B. Jaffe), *Public Utilities Fortnightly*, April 1995.

"The Redefinition of Property Rights in American Indian Reservations: A Comparative Analysis of Native American Economic Development" (with Stephen Cornell), L. H. Legters and F. J. Lyden, eds., *American Indian Policy: Self-Governance and Economic Development*, Greenwood Press, 1994.

"Reloading the Dice: Improving the Chances for Economic Development on American Indian Reservations" (with Stephen Cornell), in J. P. Kalt and S. Cornell, eds., *What Can Tribes Do? Strategies and Institutions in American Indian Economic Development*, University of California, 1992, pp. 1-59.

"Culture and Institutions as Public Goods: American Indian Economic Development as a Problem of Collective Action" (with Stephen Cornell), in Terry L. Anderson, ed., *Property Rights and Indian Economies*, Rowman and Littlefield, 1992.

"The Regulation of Exhaustible Resource Markets" (with Shanta Devarajan), Environmental and Natural Resources Program, Center for Science and International Affairs, Kennedy School of Government, April 1991.

"Comment on Pierce," *Research in Law and Economics*, Vol. 13, 1991, pp. 57-61.

"Pathways from Poverty: Economic Development and Institution-Building on American Indian Reservations" (with Stephen Cornell), *American Indian Culture and Research Journal,* 1990.

"The Apparent Ideological Behavior of Legislators: Testing for Principal-Agent Slack in Political Institutions" (with Mark A. Zupan), *Journal of Law and Economics,* April 1990.

"How Natural Is Monopoly? The Case of Bypass in Natural Gas Distribution Markets" (with Harry G. Broadman), *Yale Journal on Regulation,* Summer 1989.

"Culture and Institutions as Collective Goods: Issues in the Modeling of Economic Development on American Indian Reservations" (with Stephen Cornell), *Project Report,* Harvard Project on American Indian Economic Development, June 1989.

"Public Choice, Culture and American Indian Economic Development" (with Stephen E. Cornell), *Project Report,* Harvard Project on American Indian Economic Development, July 1988.

"The Political Economy of Protectionism: Tariffs and Retaliation in the Timber Industry," in R. Baldwin, ed., *Trade Policy Issues and Empirical Analysis,* University of Chicago Press, 1988.

"The Impact of Domestic Environmental Regulatory Policy on U.S. International Competitiveness," *International Competitiveness,* A.M. Spence and H.A. Hazard, eds., Ballinger Publishing Co., 1988.

"Re-Establishing the Regulatory Bargain in the Electric Utility Industry," *Discussion Paper Series,* Energy and Environmental Policy Center, Kennedy School of Government, March 1987, published as Appendix V in *Final Report of the Boston Edison Review Panel,* W. Hogan, B. Cherry and D. Foy, March 1987.

"Natural Gas Policy in Turmoil" (with Frank C. Schuller), in J. P. Kalt and F. C. Schuller, eds., *Drawing the Line on Natural Gas Regulation: The Harvard Study on the Future of Natural Gas Policy,* Greenwood-Praeger Press/Quorum Books, 1987.

"Market Power and Possibilities for Competition," in J. P. Kalt and F. C. Schuller, eds., *Drawing the Line on Natural Gas Regulation: The Harvard Study on the Future of Natural Gas Policy,* Greenwood-Praeger Press/Quorum Books, 1987.

"The Political Economy of Coal Regulation: The Power of the Underground Coal Industry," in R. Rogowsky and B. Yandle, eds., *The Political Economy of Regulation,* Federal Trade Commission, GPO, 1986, and in *Regulation and Competitive Strategy,* University Press of America, 1989.

"Regional Effects of Energy Price Decontrol: The Roles of Interregional Trade, Stockholding, and Microeconomic Incidence" (with Robert A. Leone), *Rand Journal of Economics,* Summer 1986.

"A Framework for Diagnosing the Regional Impacts of Energy Price Policies: An Application to Natural Gas Deregulation" (with Susan Bender and Henry Lee), *Resources and Energy Journal*, March 1986.

"Exhaustible Resource Price Policy, International Trade, and Intertemporal Welfare," February 1986 (revised June 1988), *Journal of Environmental Economics and Management*, 1989.

"Intertemporal Consumer Surplus in Lagged-Adjustment Demand Models" (with Michael G. Baumann), *Energy Economics Journal*, January 1986.

"A Note on Nonrenewable Resource Extraction Under Discontinuous Price Policy" (with Anthony L. Otten), *Journal of Environmental Economics and Management*, December 1985.

"Capture and Ideology in the Economic Theory of Politics" (with Mark A. Zupan), *American Economic Review*, June 1984.

"The Ideological Behavior of Legislators: Rational On-the-Job Consumption of Just a Residual?" (with Mark A. Zupan), Harvard Institute of Economic Research, Discussion Paper No. 1043, March 1984 (revised November 1984, Stanford University Conference on *The Political Economy of Public Policy*, R. Noll, ed.).

"A Comment on 'The Congressional-Bureaucratic System: A Principal Agent Perspective,'" *Public Choice*, Martinus Nijhoff Publishers, Dordrecht, The Netherlands, Vol. 44, 1984, pp. 193-95.

"The Creation, Growth and Entrenchment of Special Interests in Oil Price Policy," in *Political Economy of Deregulation*, Roger G. Noll and Bruce M. Owen, eds., American Enterprise Institute, 1983.

"The Costs and Benefits of Federal Regulation of Coal Strip Mining," *Natural Resources Journal*, October 1983.

"Oil and Ideology in the United States Senate," *The Energy Journal*, April 1982.

"Public Goods and the Theory of Government," *The Cato Journal*, Fall 1981.

"The Role of Governmental Incentives in Energy Production" (with Robert S. Stillman), *Annual Review of Energy*, Vol. 5, Annual Reviews Inc., 1980, pp. 1-32.

"Why Oil Prices Should be Decontrolled" (with Kenneth J. Arrow), *Regulation*, September/October 1979, pp. 13-17.

"Technological Change and Factor Substitution in the United States, 1929-67," *International Economic Review*, Spring/Summer 1977.

"The Capital Shortage: Concept and Measurement" (with George M. von Furstenberg), *The Journal of Economics and Business*, Spring/Summer 1977, pp. 198-210.

"Problems of Stabilization in an Inflationary Environment: Discussion of Three Papers," *1975 Proceedings of the Business and Economic Statistics Section: American Statistical Association Annual Meetings*, pp. 20-22.

PUBLICATIONS AND RESEARCH: RESEARCH REPORTS AND MONOGRAPHS

"The Context and Meaning of Family Strengthening in Indian America: A Report to the Annie E. Casey Foundation" (with Amy Besaw, Andrew Lee, Jasmin Sethi, Julie Boatright Wilson, Marie Zemler), The Harvard Project on American Indian Economic Development, John F. Kennedy School of Government, Harvard University, November 2003.

Alaska Native Self-Government and Service Delivery: What Works? (with Stephen Cornell), Report to the Alaskan Federation of Natives, The Harvard Project on American Indian Economic Development, John F. Kennedy School of Government, Harvard University, August 2003.

"The Costs, Benefits, and Public Policy Merits of the Proposed Western Navajo-Hopi Lake Powell Pipeline" (with Jonathan B. Taylor and Kenneth W. Grant II), December 22, 1999.

"A Public Policy Evaluation of the Arizona State Land Department's Treatment of the Island Lands Trust Properties at Lake Havasu City" (with Jonathan B. Taylor and Matthew S. Hellman), August 16, 1999.

"Reserve-Based Economic Development: Impacts and Consequences for Caldwell Land Claims" (with Kenneth W. Grant, Eric C. Henson, and Manley A. Begay, Jr.), August 10, 1999.

"Policy Recommendations for the Indonesian Petrochemical Industry" (with Robert Lawrence, Henry Lee, Sri Mulyani and LPEM, and DeWitt & Company), March 1, 1999.

"American Indian Gaming Policy and Its Socio-Economic Effects: A Report to the National Gambling Impact Study Commission" (with Stephen Cornell, Matthew Krepps, and Jonathan Taylor), July 31, 1998.

Preliminary Report in Response to an IRS Report (with David Reishus), August 8, 1997, and *Preliminary Report Concerning the Value of a Business Opportunity* (with David Reishus), September 12, 1997. Reports prepared on behalf of a large international petroleum company in connection with IRS tax assessment.

"Public Interest Assessment of the Proposed BLM/Del Webb Land Exchange in Nevada," report submitted to the U.S. Department of the Interior on behalf of Del Webb Conservation Holding Corporation, June 25, 1996.

"Politics Versus Policy in the Restructuring Debate," The Economics Resource Group, Inc., funded by Northeast Utilities System Companies, June 1995.

"Indexing Natural Gas Pipeline Rates" (with Amy B. Candell, Sheila M. Lyons, Stephen D. Makowka, and Steven R. Peterson), The Economics Resource Group, Inc., April 1995.

"An Economic Analysis of Electricity Industry Restructuring in New England" (with Adam B. Jaffe), The Economics Resource Group, Inc., funded by Northeast Utilities System Companies, April 1995.

"Oversight of Regulated Utilities' Fuel Supply Contracts: Achieving Maximum Benefit from Competitive Natural Gas and Emission Allowance Markets" (with Adam B. Jaffe), The Economics Resource Group, Inc., funded by Enron Gas Services Corporation, April 1993.

"Incentives and Taxes: Improving the Proposed BTU Tax and Fostering Competition in Electric Power Generation," Harvard University and The Economics Resource Group, Inc., March 10, 1993.

"An Assessment of the Impact of the PT Chandra Asri Petrochemical Project on Indonesia's Economy" (with Henry Lee, Dr. Robert Lawrence, Dr. Ronald M. Whitefield, and Bradley Blesie), The Economics Resource Group, Inc., December 1991.

"The Federal Energy Regulatory Commission's Proposed Policy Statement on Gas Inventory Charges (PL 89-1-000)" (with Charles J. Cicchetti and William W. Hogan), *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, July 1989.

"The Redesign of Rate Structures and Capacity Auctioning in the Natural Gas Pipeline Industry," *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, June 1988.

"The Redefinition of Property Rights in American Indian Reservations: A Comparative Analysis of Native American Economic Development," *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, June 1987

"A Review of the Adequacy of Electric Power Generating Capacity in the United States, 1985-93 and 1993-Beyond" (with James T. Hamilton and Henry Lee), *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, June 1986.

"Energy Issues in Thailand: An Analysis of the Organizational and Analytical Needs of the Thailand Development Research Institute," Harvard Institute for International Development, March 1986.

"Possibilities for Competition in the Gas Industry: The Roles of Market Structure and Contracts," prepared for Harvard Study on the Future of Natural Gas Policy, Working Group Meeting, October 1985.

"Natural Gas Decontrol, Oil Tariffs, and Price Controls: An Intertemporal Comparison," Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, April 1985.

"Market Structure, Vertical Integration, and Long-Term Contracts in the (Partially) Deregulated Natural Gas Industry," *Discussion Paper Series*, Harvard Institute of Economic Research, Harvard University, April 1985.

"Can a Consuming Region Win under Gas Decontrol?: A Model of Income Accrual, Trade, and Stockholding" (with Robert A. Leone), *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, February 1984.

"Natural Gas Decontrol: A Northwest Industrial Perspective" (with Susan Bender and Henry Lee), *Discussion Paper Series*, John F. Kennedy School of Government, Harvard University, November 1983.

"Natural Gas Decontrol: A Northeast Industrial Perspective" (with Henry Lee and Robert A. Leone), *Discussion Paper Series*, John F. Kennedy School of Government, Harvard University, October 1982.

"Television Industry Self-Regulation: Protecting Children from Competition in Broadcasting" (with George J. Holder), Harvard Institute of Economic Research, Discussion Paper No. 896, April 1982.

"The Use of Political Pressure as a Policy Tool During the 1979 Oil Supply Crisis" (with Stephen Erfle and John Pound), *Discussion Paper Series*, John F. Kennedy School of Government, Harvard University, April 1981.

"Problems of Minority Fuel Oil Dealers" (with Henry Lee), *Discussion Paper Series*, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, April 1981.

OTHER PUBLICATIONS AND LEGISLATIVE TESTIMONY

"Institution Building: Organizing for Effective Management" in *Building Native Nations: Environment, Natural Resources, and Governance*, ed. by Stephanie Carroll Rainie, Udall Center for Studies in Public Policy, The University of Arizona, 2003.

Statement to U.S. Senate Committee on Indian Affairs, *Lessons in Economic Development*, Hearings Regarding International Lessons in Economic Development, September 12, 2002 (hearings cancelled September 11, 2002).

Statement to U.S. House of Representatives Committee on Government Reform, Subcommittee for Energy Policy, Natural Resources and Regulatory Affairs, Hearings Regarding Natural Gas Capacity, Infrastructure Constraints, and Promotion of Healthy Natural Gas Markets, Especially in California, October 16, 2001.

Statement to U.S. Senate Committee on Indian Affairs, *Harvard University Native American Program*, Hearings Regarding Native American Program Initiatives at the College and University Level (with Dr. Ken Pepion), June 21, 2001.

Statement to The Surface Transportation Board, *Public Views on Major Rail Consolidations* (with José A. Gómez-Ibáñez), November 17, 2000, and January 11, 2001.

Statement to U.S. Senate Committee on Indian Affairs, *Impact of Federal Development Initiatives in Indian Country*, Hearing Regarding S.2052, of September 27, 2000.

Foreword to *Impossible to Fail*, J.Y. Jones, Hillsboro Press, 1999.

Statement to U.S. House of Representatives, Subcommittee on Energy and Mineral Resources, *Federal Oil Royalty Valuation* (HB 3334), Hearing of May 21, 1998.

Statement to the National Gambling Impact Study Commission, *Economic Impact of Gaming by American Indian Tribes*, Hearing of March 16, 1998.

"Measures Against Tribes Are Counterproductive," editorial (with Jonathan B. Taylor), *Indian Country Today*, September 22-29, 1997.

"American Indian Economic Development," *Tribal Pathways Technical Assistant Program Newsletter*, February 1997, p. 3.

Statement to U.S. Senate Committee on Indian Affairs, *Economic Development in Indian Country*, Hearing of September 17, 1996.

"A Harvard Professor Looks at the Effects of Allowing U.S. Hunters to Import Polar Bear Trophies," *Safari Times*, April 1994.

Statement to U.S. Congress, Joint Economic Committee, Subcommittee on Trade, Productivity and Economic Growth, *The Economic Impact of Lower Oil Price*, Hearing of March 12, 1986.

"Administration Backsliding on Energy Policy" (with Peter Navarro), *Wall Street Journal*, editorial page, February 9, 1982.

Statement to the Energy and Natural Resources Committee, U.S. Senate, *Government Responses to Oil Supply Disruptions*, Hearing of July 28-29, 1981, U.S. Government Printing Office, 1981, pp. 623-630 and 787-801.

"Staff Report on Effects of Restrictions on Advertising and Commercial Practice in the Professions: The Case of Optometry," Ronald S. Bond, *et al.*, Executive Summary, Bureau of Economics, Federal Trade Commission, September 1980.

"Redistribution of Wealth in Federal Oil Policy," *San Diego Business Journal*, August 18, 1980, pp. 22-3.

"The Energy Crisis—Moral Equivalent of Civil War" (with Peter Navarro), *Regulation*, January/February 1980, pp. 41-43.

"Windfall Profits Tax Will Reap Bonanza—But For Whom?" (with Peter Navarro), *The Miami Herald*, December 23, 1979, editorial page.

SELECTED PRESENTATIONS

"The State of U.S. Railroads and the Challenges Ahead," briefing of Capitol Hill staff, Association of American Railroads, April 17, 2003.

"The State of the Railroad Industry and the Challenges Ahead," briefing of Roger Nober, Chairman, US Surface Transportation Board, Association of American Railroads, January 28, 2003.

"The Wealth of American Indian Nations: Culture and Institutions," Federal Reserve Bank of Boston, December 11, 2002.

"The Roots of California's Energy Crisis: Law, Policy, Politics, and Economics," Regulation Seminar, Center for Business and Government, Kennedy School, Harvard University, November 7, 2002.

"Public Policy Foundations of Nation Building in Indian Country," National Symposium on Legal Foundations of American Indian Self-Governance," Mashantucket Pequot Nation, February 9, 2001.

"Twenty-Five Years of Self-Determination: Lessons from the Harvard Project on American Indian Economic Development," Udall Center for Studies in Public Policy, University of Arizona, November 13-14, 1999.

Proceedings of the Fourth Annual DOE-NARUC Natural Gas Conference, Orlando, FL, February 1995.

Keynote Address, "Sovereignty and American Indian Economic Development," Arizona Town Hall, Grand Canyon, AZ, October 1994.

"Is the Movement Toward a Less-Regulated, More Competitive LDC Sector Inexorable?, (Re)Inventing State/Federal Partnerships: Policies for Optimal Gas Use," U.S. Department of Energy and The National Association of Regulatory Utility Commissioners Annual Conference, Nashville, TN, February 1994.

"Cultural Evolution and Constitutional Public Choice: Institutional Diversity and Economic Performance on American Indian Reservations," Festschrift in Honor of Armen A. Alchian, Western Economic Association, Vancouver, BC, July 1994.

"Precedent and Legal Argument in U.S. Trade Policy: Do they Matter to the Political Economy of the Lumber Dispute?" National Bureau of Economic Research, Conference on Political Economy of Trade Protection, February, September 1994.

"The Redesign of Rate Structures and Capacity Auctioning in the Natural Gas Pipeline Industry," Natural Gas Supply Association, Houston, TX, March 1988.

"Property Rights and American Indian Economic Development," Pacific Research Institute Conference, Alexandria, VA, May 1987.

"The Development of Private Property Markets in Wilderness Recreation: An Assessment of the Policy of Self-Determination by American Indians," Political Economy Research Center Conference, Big Sky, MT, December 4-7, 1985.

"Lessons from the U.S. Experience with Energy Price Regulation," International Association of Energy Economists Delegation to the People's Republic of China, Beijing and Shanghai, PRC, June 1985.

"The Impact of Domestic Regulation on the International Competitiveness of American Industry," Harvard/NEC Conference on International Competition, Ft. Lauderdale, FL, March 7-9, 1985.

"The Welfare and Competitive Effects of Natural Gas Pricing," American Economic Association Annual Meetings, December 1984.

"The Ideological Behavior of Legislators," Stanford University Conference on the Political Economy of Public Policy, March 1984.

"Principal-Agent Slack in the Theory of Bureaucratic Behavior," Columbia University Center for Law and Economic Studies, 1984.

"The Political Power of the Underground Coal Industry," FTC Conference on the Strategic Use of Regulation, March 1984.

"Decontrolling Natural Gas Prices: The Intertemporal Implications of Theory," International Association of Energy Economists Annual Meetings, Houston, TX, November 1981.

"The Role of Government and the Marketplace in the Production and Distribution of Energy," Brown University Symposium on Energy and Economics, March 1981.

"A Political Pressure Theory of Oil Pricing," Conference on New Strategies for Managing U.S. Oil Shortages, Yale University, November 1980.

"The Politics of Energy," Eastern Economic Association Annual Meetings, 1977.

WORKSHOPS PRESENTED

Federal Reserve Bank of Boston; University of Indiana; University of Montana; Oglala Lakota College; University of New Mexico; Columbia University Law School; Department of Economics and John F. Kennedy School of Government, Harvard University; MIT; University of Chicago; Duke University; University of Rochester; Yale University; Virginia Polytechnic Institute; U.S. Federal Trade Commission; University of Texas; University of Arizona; Federal Reserve Bank of Dallas; U.S. Department of Justice; Rice University; Washington University; University of Michigan; University of Saskatchewan; Montana State University; UCLA; University of Maryland; National Bureau of Economic Research; University of Southern California.

OTHER PROFESSIONAL ACTIVITIES

Board of Trustees, The Communications Institute, 2003-present

Board of Trustees, Fort Apache Heritage Foundation, 2000-present

Mediator (with Keith G. Allred), Nez Perce Tribe and the North Central Idaho Jurisdictional Alliance, MOU signed December 2002

Mediator, *In the Matter of the White Mountain Apache Tribe v. United States Fish and Wildlife Service*, re: endangered species management authority, May-December, 1994

Steering Committee, National Park Service, 75th Anniversary Symposium, 1991-93

Board of Trustees, Foundation for American Communications, 1989-2003

Editorial Board, *Economic Inquiry*, 1988-2002

Advisory Committee, Oak Ridge National Laboratory, Energy Division, 1987-1989

Commissioner, President's Aviation Safety Commission, 1987-88

Principal Lecturer in the Program of Economics for Journalists, Foundation for American Communications, teaching economic principles to working journalists in the broadcast and print media, 1979-present

Lecturer in the Economics Institute for Federal Administrative Law Judges, University of Miami School of Law, 1983-1991

Research Fellow, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University, 1981-1987

Editorial Board, MIT Press Series on *Regulation of Economic Activity*, 1984-1992

Research Advisory Committee, American Enterprise Institute, 1979-1985

Editor, *Quarterly Journal of Economics*, 1979-1984

Referee for *American Economic Review, Bell Journal of Economics, Economic Inquiry, Journal of Political Economy, Review of Economics and Statistics, Science Magazine, Journal of Policy Analysis and Management, Social Choice and Welfare, Quarterly Journal of Economics*, MIT Press, North-Holland Press, Harvard University Press, *American Indian Culture and Research Journal*

TEACHING EXPERIENCE

Native Americans in the 21st Century: Nation Building I & II (University-wide, graduate and undergraduate); Introduction to Environment and Natural Resource Policy (Graduate, Kennedy School of Government); Seminar in Positive Political Economy (Graduate, Kennedy School of Government); Intermediate Microeconomics for Public Policy (Graduate, Kennedy School of Government); Natural Resources and Public Lands Policy (Graduate, Kennedy School of Government); Economics of Regulation and Antitrust (Graduate); Economics of Regulation (Undergraduate); Introduction to Energy and Environmental Policy (Graduate, Kennedy School of Government); Graduate Seminar in Industrial Organization and Regulation; Intermediate Microeconomics (Undergraduate); Principles of Economics (Undergraduate); Seminar in Energy and Environmental Policy (Graduate, Kennedy School of Government)

HONORS AND AWARDS

Allyn Young Prize for Excellence in the Teaching of the Principles of Economics, Harvard University, 1978-79 and 1979-80

Chancellor's Intern Fellowship in Economics, 9/73 to 7/78, one of two awarded in 1973, University of California, Los Angeles

Smith-Richardson Dissertation Fellowship in Political Economy, Foundation for Research in Economics and Education, 6/77 to 9/77, UCLA

Summer Research Fellowship, UCLA Foundation, 6/76 to 9/76

Dissertation Fellowship, Hoover Institution, Stanford University, 9/77 to 6/78

Four years of undergraduate academic scholarships, 1969-1973; graduated with University Distinction and Departmental Honors, Stanford University

Research funding sources have included: The National Science Foundation; USAID (IRIS Foundation); Pew Charitable Trust; Christian A. Johnson Family Endeavor Foundation; The Ford Foundation; The Kellogg Foundation; Harvard Program on the Environment; The Northwest Area Foundation; the U.S. Department of Energy; the Research Center for Managerial Economics and Public Policy, UCLA Graduate School of Management; the MIT Energy Laboratory; Harvard's Energy and Environmental Policy Center; the Political Economy Research Center; the Center for Economic Policy Research, Stanford University; the Federal Trade Commission; and Resources for the Future; The Rockefeller Foundation.

Exhibit JPK-2
APS WITNESS WORKPAPERS, DISCOVERY RESPONSES, AND OTHER RELEVANT DOCUMENTS CITED IN KALT TESTIMONY

ARIZONA COMPETITIVE POWER ALLIANCE FIRST SET OF DATA REQUESTS TO ARIZONA PUBLIC SERVICE COMPANY IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN, AND FOR APPORVAL OF PURCHASED POWER CONTRACT E-01345A-03-0437

AzCPA 1-107. Do you believe that APS should acquire the PWEC generation assets even if it could be demonstrated that power could be procured on a long-term basis from a credit-worthy third party at a lower cost following the expiration of the PWEC Track B contracts? Please explain your response in detail, including supporting workpapers for any calculations performed.

RESPONSE:

Yes. While APS believes that future energy needs should be met through a mix of generation assets owned and operated by APS and purchases from the wholesale generation market, the purpose for and benefits of acquiring and rate basing the PWC assets as part of this plan are provided in Mr. Wheeler's testimony at page 13, line 1, through page 18, line 25. In addition, APS recently announced that it soon will be soliciting competitive bids for long-term power in order to further this objective.

Witness: Steve Wheeler

ARIZONA COMPETITIVE POWER ALLIANCE FIRST SET OF DATA REQUESTS TO ARIZONA PUBLIC SERVICE COMPANY IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN, AND FOR APPORVAL OF PURCHASED POWER CONTRACT E-01345A-03-0437

AzCPA 1-110. Regarding the direct testimony commencing at page 15, line 4, had the Electric Competition Rules and the 1999 Settlement been fully implemented, would PWEC have been legally obligated to enter into contracts to sell power to APS at below prevailing market prices? If your answer is in the affirmative, please provide a detailed explanation for your conclusion.

RESP0NSE:

APS assumed that PWEC sales would be at the market prices prevailing in an efficiently-functioning competitive market. It is not aware of any legal obligation of PWEC to sell power to APS or any other entity for less than this fully-competitive market price.

Witness: Steve Wheeler

**ARIZONA COMPETITIVE POWER ALLIANCE FIRST SET OF DATA REQUESTS
TO ARIZONA PUBLIC SERVICE COMPANY
IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN, AND FOR APPORVAL OF PURCHASED POWER CONTRACT
E-01345A-03-0437**

AzCPA 1-112. Did PWEC intentionally propose what it believed to be below-market prices in response to the Track B solicitation? If your response is in the affirmative, please describe in detail why PWEC proposed such prices.

RESPONSE:

PWEC did an independent Track B bid. APS has no reason to believe PWEC bid less that its (PWEC's) evaluation of then current prices.

Witness: Steve Wheeler

LA CAPRA'S FOURTH SET OF DATA REQUESTS
TO ARIZONA PUBLIC SERVICE COMPANY
IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN, AND FOR APPORVAL OF PURCHASED POWER CONTRACT
E-01345A-03-0437

LCA 4-97 (a) Please identify all APS departments, groups, committees, etc. that have had past involvement in generation planning, generation development, power procurement, power trading, or making decisions regarding the foregoing at APS (if different from those in the preceding data request). (b) Please specify the specific responsibilities of each such entity, and (c) please identify the persons involved by name and position for each entity.

RESPONSE:

Generation planning is and was performed by the Resource Planning department. The responsibilities of the APS Resource Planning Department were already provided in response to LCA 3-71. Ajit Bhatti, currently the Vice President, Resource Planning, heads the Resource Planning department.

New generation development was performed by the GBU, which originally encompassed only APS generation Planning and Development, but with the creation of PWEC in late 1999, covered both APS and PWEC. See Response to LCA 4-96.

David Hansen, currently the Vice President, Marketing & Trading headed the Marketing & Trading department first at PWCC and now at APS. This department has responsibility for power procurement and power trading.

Witness- Ajit Bhatti

**LA CAPRA'S FOURTH SET OF DATA REQUESTS
TO ARIZONA PUBLIC SERVICE COMPANY
IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN, AND FOR APPORVAL OF PURCHASED POWER CONTRACT
E-01345A-03-0437**

LCA 4-98 Please identify the entity that is responsible for executing sales transactions for PWEC supplies (i.e., who sells PWEC power):

(a) in real-time markets;
(b) in day-ahead markets;
(c) involving transactions of less than three months; and
(d) involving transactions of more than three months.

RESPONSE:

(a), (b), (c) All sales of PWEC output acquired under Track B for APS customers is controlled by APS Marketing and Trading (Regulated). All sales of PWEC output outside of Track B are controlled by APS Marketing and Trading (Unregulated).

(d) Only PWEC personnel were involved with respect to the sale from PWEC to APS as part of Track B; APS Marketing and Trading (Unregulated) in conjunction with PWEC, is responsible for all other transactions.

Witness-Steve Wheeler/Donald Robinson

MERRILL LYNCH

January 26, 2004
10:00 a.m. ET

Coordinator — Good day, ladies and gentlemen, and welcome to your FERC conference call. At this time, all lines are in a listen only mode. After our presentation, we'll open the call to questions. I'd like to advise you this conference is being recorded for replay purposes. Now I'd like to turn the call over to your host, Mr. Steve Fleischman. Sir, please proceed.

S. Fleischman — Thank you. Good morning. I'm sure a lot of you had trouble getting into your offices today, but thanks of taking the time. I'm very happy to have Pat Wood, who is the Chairman of FERC, speak with us today. One of our focuses this year is to highlight a number of the key regulatory developments and regulatory movers and shakers, so to speak, as we think, in general, the sector has somewhat calmed down from its crisis mode over the last few years and that, in many cases, regulatory developments will be key issues from a value perspective, and who better to kick that off

Atlantic, but also to talk about the issue more broadly. It's coming up in MISO. It's coming up in California. It's coming up in New England and New York. It's everywhere, but how to deal with just these little local market power issues. When you might have a competitive market working pretty much across a large region, you don't necessarily need to get in there with real heavy-handed approaches everywhere. We just need to be more surgical about how we look at market power and not try to use, I think as we have in the past, including even in the recent past, a real broad brush to deal with that.

Not you asked kind of a parenthetical question about a pending case. As the Commission always has, we will look at any acquisitions, mergers or sales that impact the competitive power market. We look at those for their effect on the marketplace, their effect on rates, their effect on customers. As the wholesale regulator, I will admit some concern about the acquisition of temporarily distressed generation assets by the local utilities that would otherwise be buying under a long-term contract.

I think we're, to cut to the chase, concerned about not only deals with the affiliates, but just deals that make the power markets more concentrated as opposed to more disaggregated. That means less competition, and it

P. Wood I think we're concerned about both, for slightly different reasons. I think the Ameren case probably was that. We had a Cinergy case that we basically let get through, but announced the reasons why we care about those things, but those are the same reasons why we care about all the …. They take players out of the competitive market and the wholesale market, and make that market thereby thinner and weaker as a consequence.

We're concerned on a number of levels, but that's one, with both the affiliated acquisitions and the non-affiliated acquisitions. The OGE would probably be a good example of the second category that you mentioned.

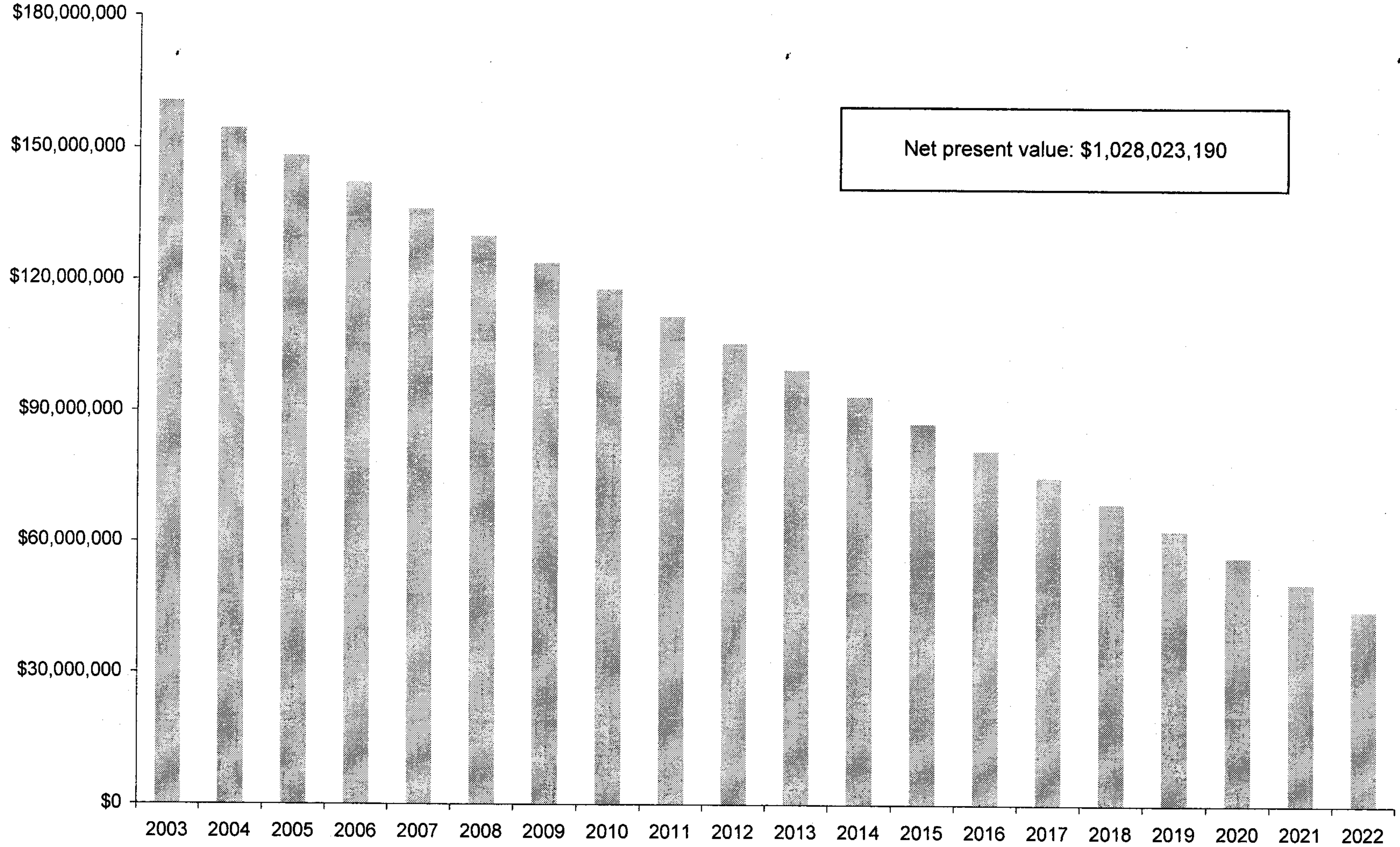
J. Green Is it fair to say, from what I heard you mention, that you would rather see an arrangement of the long-term PBA or something like that as opposed to outright ownership?

P. Wood Correct.

J. Green Thank you very much.

Coordinator You have a question from Jessica Rutledge of Lazard Asset Management.

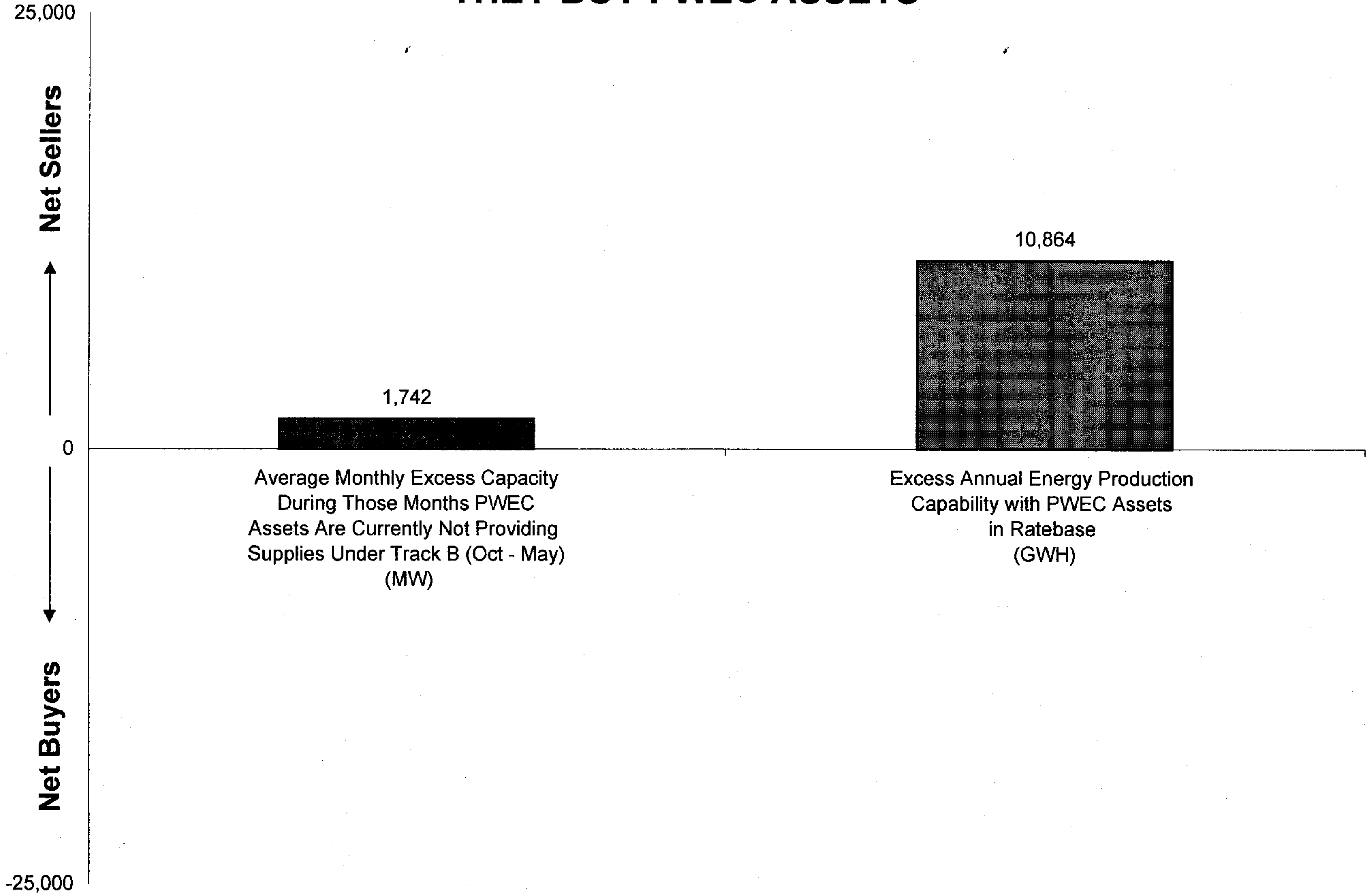
Exhibit JPK-3
"INSURANCE" PURCHASED BY CONSUMERS IF PWEC ASSETS ARE RATEBASED



Annual amount is calculated as depreciation plus the annual return on undepreciated ratebase (at 8.31%), grossed up to account for taxes (using the Company's "gross up factor" of 1.6529). A twenty-year depreciable life is assumed. Present value is calculated using a discount rate of 10%.

Sources: Schedule B-2 (revised); Direct Testimony of Chris N. Froggatt; Direct Testimony of Donald G. Robinson; Ajo Gas Service Tariff.

Exhibit JPK-4
APS RATEPAYERS WILL BE NET SELLERS OF POWER IF THEY BUY PWEC ASSETS



Sources: APB_WP9, DR001654, 12/03 AZ RFP, RC001035, APS Response to MR 1.4. See also Exhibits JDT-4 through JDT-7.

Exhibit JPK-5

Planning Scenarios- Attributes

	Scenario 1 Return to Regulation	Scenario 2 Return to Part Regulation	Scenario 3 Current Path - Dereguation	Scenario 4 Bilateral Ten Year Agreement
Business Transaction	APS/PWEC Full Reqmts Contract	Existing Units Contract	Full Market	APS/PWEC Full Reqmts Contract
Off System Purchases	PWEC buys emergency purchases	Delivery Buys @ Mkt	Delivery Buys @ Mkt	PWEC Manages
APS DELIVERY:				
PCorp & SRP Purchases	Stays with Delivery	Stays with Delivery	Stays with Delivery	Stays with Delivery
Delivery Energy Price	PWEC Units @ 11.25% plus emergency purchase	Existing Gen @ 11.25% + Purchases @ Mkt	Market Price	Ten Year Bi-lateral contract w/ PWEC
Delivery Customer Prices	To maintain 11.25% ROE before O/S margins	To maintain 11.25% ROE before O/S margins	To maintain 11.25% ROE	Affordable PBR
Delivery Purchase Power Adjustment Clause	YES	YES	YES	NO
PWEC GENERATION:				
Existing Generation Sales	Priority to APS, excess to market	Priority to APS, excess to market	To Market	Priority to APS, excess to market
Existing Generation Price	APS load @ 11.25% + Off-System margin kept	APS Load @ 11.25% + Off-System Margin	Market Price	Affordable delivery price, Allocated
New Generation Sales	Priority to APS, excess to market	To Market	To Market	Priority to APS, excess to market
New Generation Price	APS load @ 11.25% + Off-System margin kept	Market Price	Market Price	Affordable delivery price, Allocated
Exposure to market risk	Nil	Moderate	High	Nil
Capacity - MW's (2006)	754	3779	7705	754
Energy - GWH (2006)	xxx	xxx	xxx	xxx

APB_W30 6/104

Exhibit JPK-6

PWEC PLANTS WERE BUILT TO SELL INTO THE COMPETITIVE WHOLESALE MARKET

Before the Arizona Power Plant and Transmission Line Siting Committee ("Siting Committee"), PWCC clearly stated its intent to develop the Redhawk facility as a merchant plant in the proceedings for its Certificate of Environmental Compliance ("CEC"). In that hearing, the following exchange occurred:

> Q. (Steve Wheeler, counsel for Pinnacle West Energy Corp.) What specific authority is being requested from the Siting Committee in this application?
>
> A. (Ed Fox, PWCC Vice President for Communications, Environment and Safety) We are requesting that the Siting Committee grant a Certificate of Environmental Compatibility for the construction of four 530 MW combined cycle natural gas fired generating units in western Maricopa County.
>
> I want to provide a quick overview of the project. These facilities will be merchant plants. They truly will be in the competitive market. They will sell energy or not depending on their ability to sell at a price that can get into the market, and as such, the risk for the generation in selling that generation will be with Pinnacle West Energy.
>
> It is intended to provide the need of the expanding, not just the Phoenix market, but also the general market in the southwest which continues to grow. And we've heard a lot of testimony on the need for new generation in both Maricopa County in Arizona and the southwest, and this site was selected in part to meet that need.

Likewise, PWCC clearly stated in its intent to develop the West Phoenix facility as a merchant plant in the proceedings for its CEC before the Siting Committee, where the following exchange occurred:

> THE WITNESS: Thank you, Sir.
> Let me start over. Pinnacle West Energy requests that the Commission grant it a Certificate of Environmental Compatibility for the construction of two combined cycle natural gas-fired generating units here in Phoenix, Arizona. Unit 1 that we call unit combined cycle four, CC4, will be 120 megawatts, and CC5, which will be 530 megawatts.

Source: Various trade press.

Exhibit JPK-6

PWEC PLANTS WERE BUILT TO SELL INTO THE COMPETITIVE WHOLESALE MARKET

> Q. (BY MR. WHEELER) Will these be dedicated units? And by that I mean, will the output be sold to one particular customer in the contract?
>
> A. No, they won't. As I explained earlier, as the utility industry moves in the competitive marketplace, part of that competitive marketplace is in the generation of electricity itself. And these facilities will be merchant plants that will be selling into the wholesale market. In this regard, and being part, selling into the wholesale market, the competitive market, being an unregulated subsidiary of Pinnacle West Capital Corporation, the ratepayers will not be at risk for this venture and for this expansion.

Finally, in March 2000, PWCC further clarified that the Redhawk unit was intended as a merchant facility when it announced that it had entered into a joint development agreement with Reliant Energy Power Generation, Inc. under which Reliant and PWCC would share "construction and operation of three merchant power plants in Arizona and Nevada" including the planned Redhawk facility. In describing the Joint Development Agreement, Mr. Post stated that the Nevada projects and the Redhawk facility "will allow us to meet increasing demands for power across the southwest and at the same time promote a competitive market that will ultimately benefit consumers. . . . We intend to create a robust generation business that helps ensure a reliable supply of electricity in the West." The same article quoted Bill Stewart, PWEC's President, as stating:

> We intend to offer competitively priced electricity in growing Southwest markets by producing low-cost energy that is accessible to key transmission hubs. . . . These projects are part of our overall growth strategy that will keep us near the top of western power producers. This partnership is a demonstration of our oft-stated goal of being a broad-based supplier for power markets in the West, where we have extensive business experience and market knowledge.

Likewise, in describing the planned development of the Redhawk facility, a September 29, 1999, article in Business Wire stated that "the plant will compete in deregulated energy markets of Arizona, California and other western states and will be operated by Pinnacle West Energy, the new Pinnacle West generating entity that was formed earlier this week." The article went on to quote PWEC's President Bill Stewart as saying:

Source: Various trade press.

Exhibit JPK-6

PWEC PLANTS WERE BUILT TO SELL INTO THE COMPETITIVE WHOLESALE MARKET

> We intend to be a vigorous player in these competitive generation markets . . . We have a strong record of low-cost, efficient plant operation. We can best serve the public and our shareholders by pursuing these developing markets, particularly in Arizona and the Southwest.

"PWE[C] entered into two agreements with APS on March 15, 2000 for APS to provide firm transmission from both West Phoenix Unit 4 and West Phoenix Unit 5 to the Palo Verde 500 Kv switchyard. For West Phoenix Unit 4, APS is providing 125 MW of reserved capacity beginning August 1, 2001 and ending March 31, 2004. For West Phoenix 5, a reserved capacity of 525 MW will begin June 1, 2003 and end September 30, 2004."
- Workpaper APB_WP28

"Pinnacle West Capital Corporation plans to develop a natural gas-fired electric generating station of up to 2,120 megawatts approximately 50 miles west of Phoenix near the Palo Verde Nuclear Generating Station switchyard, Generation President Bill Stewart announced today.
The plant will compete in deregulated energy markets of Arizona, California and other western states and will be operating by Pinnacle West Energy, the new Pinnacle West generating entity that was formed earlier this week.
'We intend to be a vigorous player in these competitive generation markets,' Stewart said.
(...)
The plant's location was selected because the Palo Verde switchyard is a major transmission hub and provides access to energy markets in Arizona, California and across the Southwest, a region that has seen significant growth. Since 1994, electricity usage in Arizona has increased more than 4.5 percent a year. "

- Pinnacle West press release, "Pinnacle West to Build Large Power Plant Project in Western Maricopa County", September 19, 1999

"Pinnacle West Energy, the generation subsidiary of Pinnacle West Capital Corporation (NYSE: PNW), today announced the beginning of construction of the Redhawk Power Plant, the largest of the projects among the company's current generation expansion activities. The Dec. 19 groundbreaking marks just one of three important milestones for the company's expansion program.
The 2,120-megawatt Redhawk Power Plant, located near the Palo Verde Nuclear Generating Station 55 miles west of Phoenix, will be the first project to actually break ground in the Palo Verde area.
"This is a major accomplishment for us, as well as for customers throughout Arizona and the West," said Bill Stewart, President of Pinnacle West Energy. "This project, along with others we have announced, will allow us to help meet increasing demands for power in Arizona and markets across the Southwest

Source: Various trade press.

Exhibit JPK-6

PWEC PLANTS WERE BUILT TO SELL INTO THE COMPETITIVE WHOLESALE MARKET

and at the same time promote a competitive market that will ultimately benefit customers. We intend to offer competitively priced electricity in these markets by producing reliable, low-cost power that is accessible to key transmission hubs.""

- Pinnacle West press release, " A Pinnacle West Energy Announces Generation Expansion Milestones", December 4, 2000

"Redhawk is a larger merchant plant..."

- Generation Business Plan 2000, Pinnacle West Energy Redhawk Project (Exhibit P-12)

"PWE is evaluating potential partnerships with other generating companies. We plân to use our ownership of the West Phoenix and Redhawk projects as leverage to obtain interests in generating plants outside Arizona under favorable conditions.

Potential partners find the growth in our service area and the Redhawk location at Palo Verde power trading "hub" to be to be attractive business opportunities. We in turn will look for turbine availability, diversification outside Arizona, immediate entry into competitive western markets, operating plants with cash flow and earnings and strategic locations in high-growth areas and/or on the "right" side of transmission constraints."

- Generation Business Plan 2000, Pinnacle West Energy Negotiate Partnerships (Exhibit P-12)

" Pinnacle West Energy has signed a joint development agreement with Reliant Energy Power Generation, Inc. (Reliant) covering construction and operation of three new merchant plants. Pinnacle West Energy plans to contribute the first two units (1,060 MW) of the Redhawk project to the joint agreement. Construction is expected to start in the third quarter of 2000, with commercial operation scheduled in the summer of 2002. Reliant plans to contribute two new natural gas-fired projects (1,500 MW) in Nevada to the venture."

- Pinnacle West Capital Corporation, 1999 Form 10-K at 52, filed March 30, 2000.

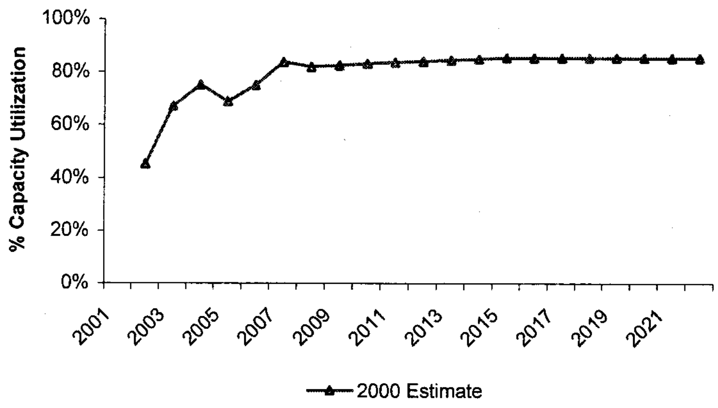
"The new generating facilities will be used to sell capacity and energy to the wholesale market and the delivery amounts will vary depending on the seasonal prices at the specified delivery points."

- Description of the supply characteristics of the capacity and energy to be delivered by W. Phoenix Power Plant, AZPS Firm Point to Point Transmission Service Application, November 1, 1999.

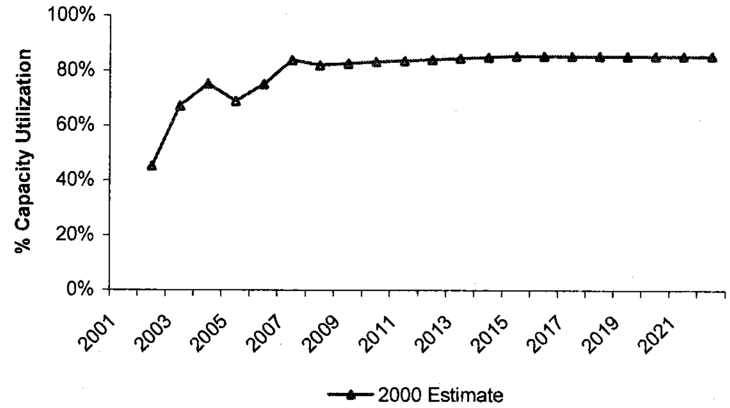
Source: Various trade press.

Exhibit JPK-7a
PWEC'S ORIGINAL FORECASTS OF CAPACITY UTILIZATION FOR ITS NEW ASSETS

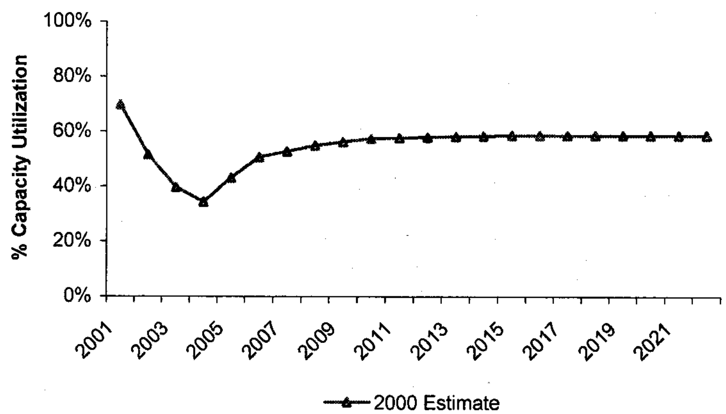
Redhawk 1



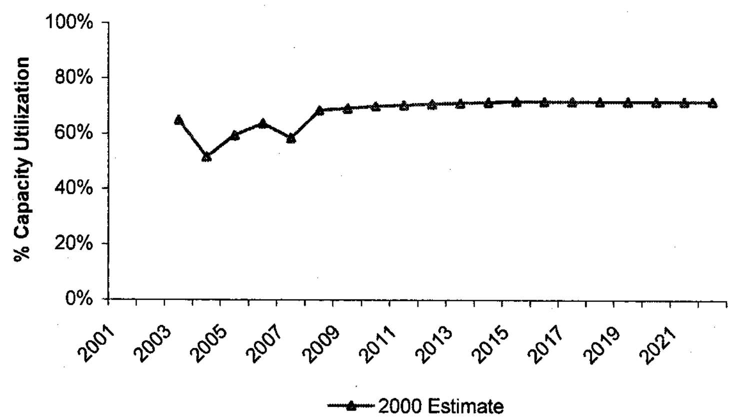
Redhawk 2



West Phoenix 4



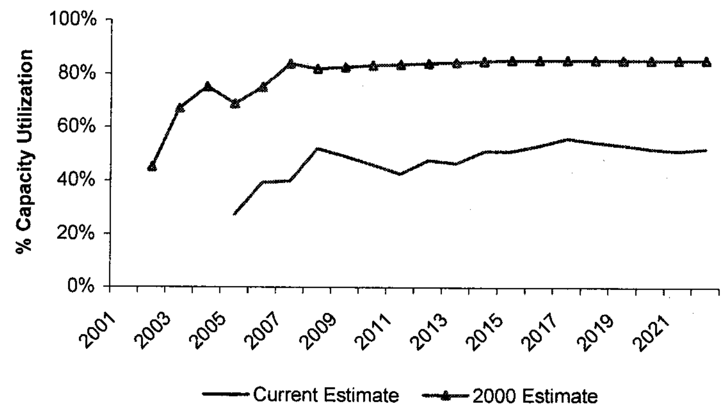
West Phoenix 5



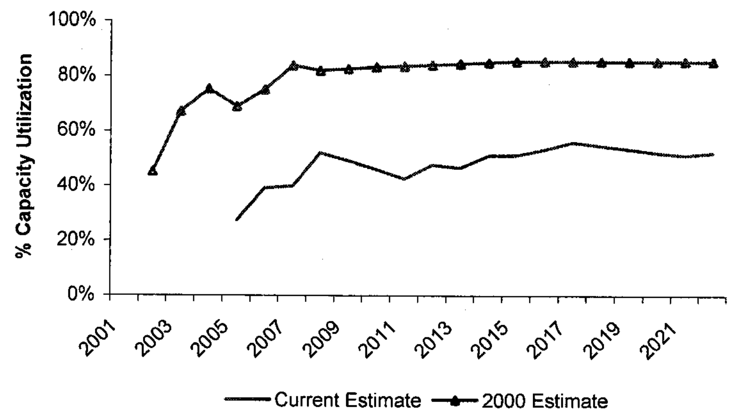
Source: APS' 2nd Informal Response to AZCPA's Data Request (Back up analyses for Direct Testimony of Ajit Bhatti, Attachment AB-5).

Exhibit JPK-7b
PWEC'S ORIGINAL v. CURRENT FORECASTS OF CAPACITY UTILIZATION FOR ITS NEW ASSETS

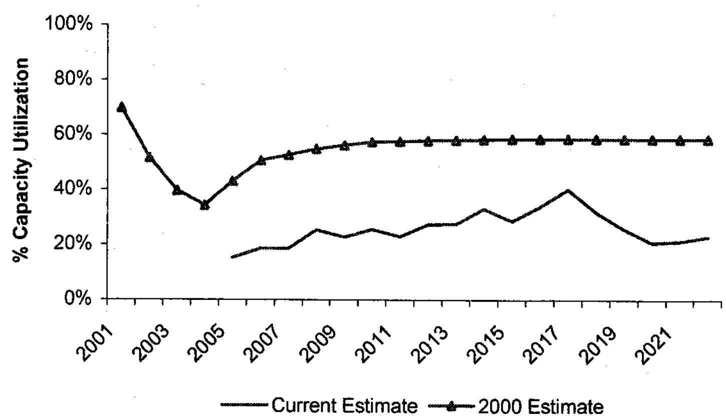
Redhawk 1



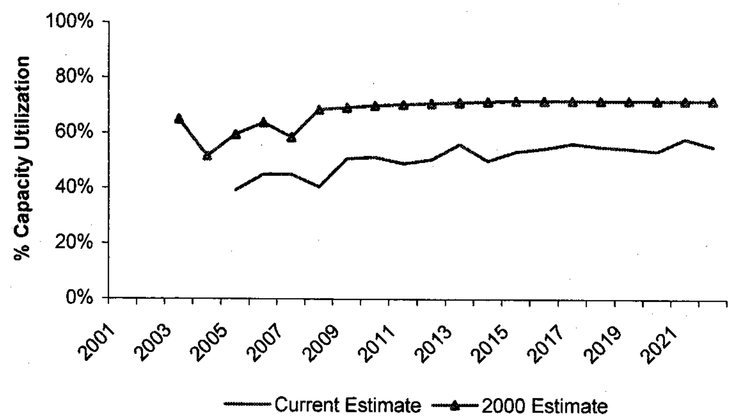
Redhawk 2



West Phoenix 4



West Phoenix 5

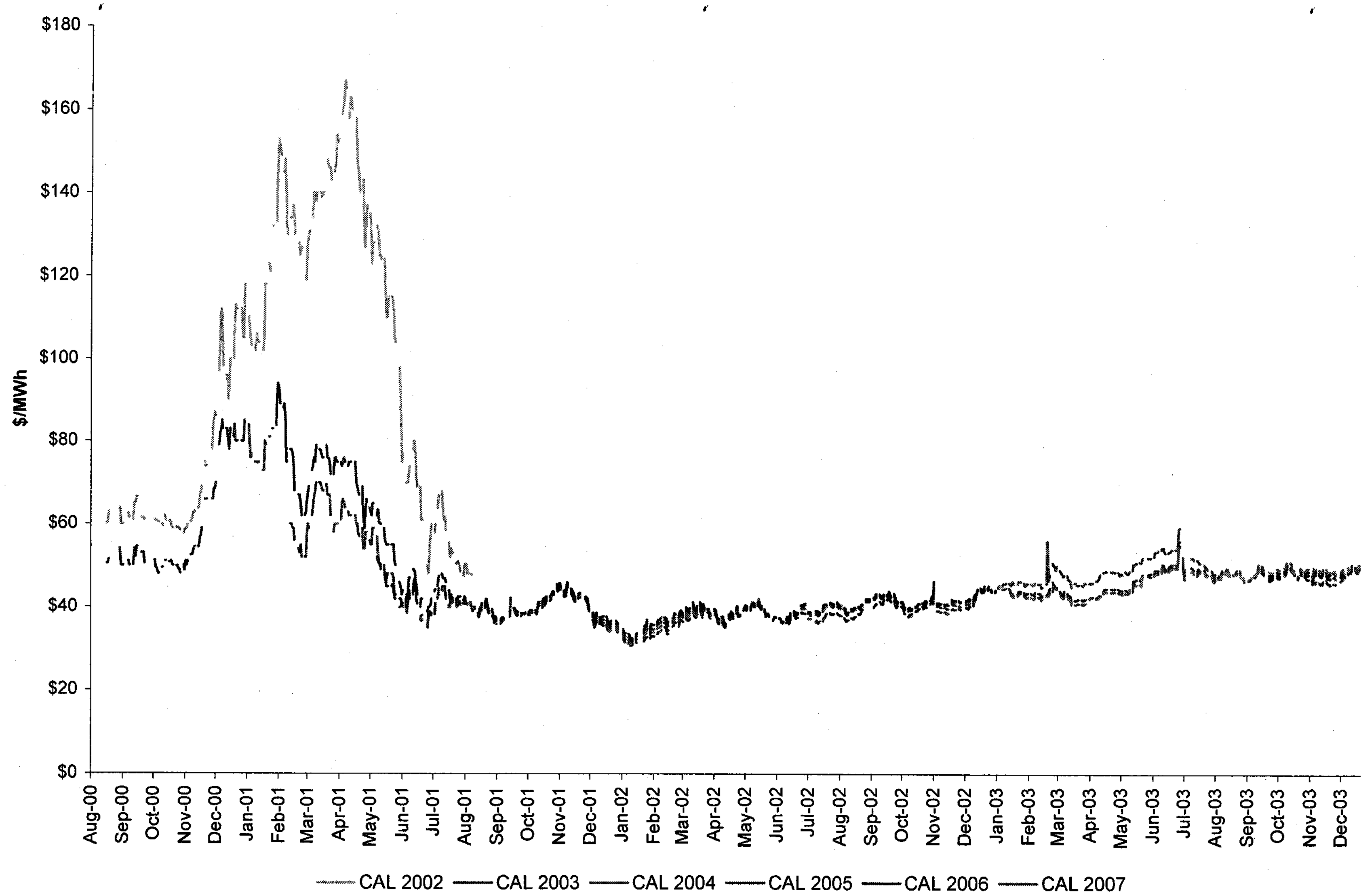


Sources: RC01243, RC01244; APS' 2nd Informal Response to AZCPA's Data Request (Back up analyses for Direct Testimony of Ajit Bhatti, Attachment AB-5).

Significant Results - Continued

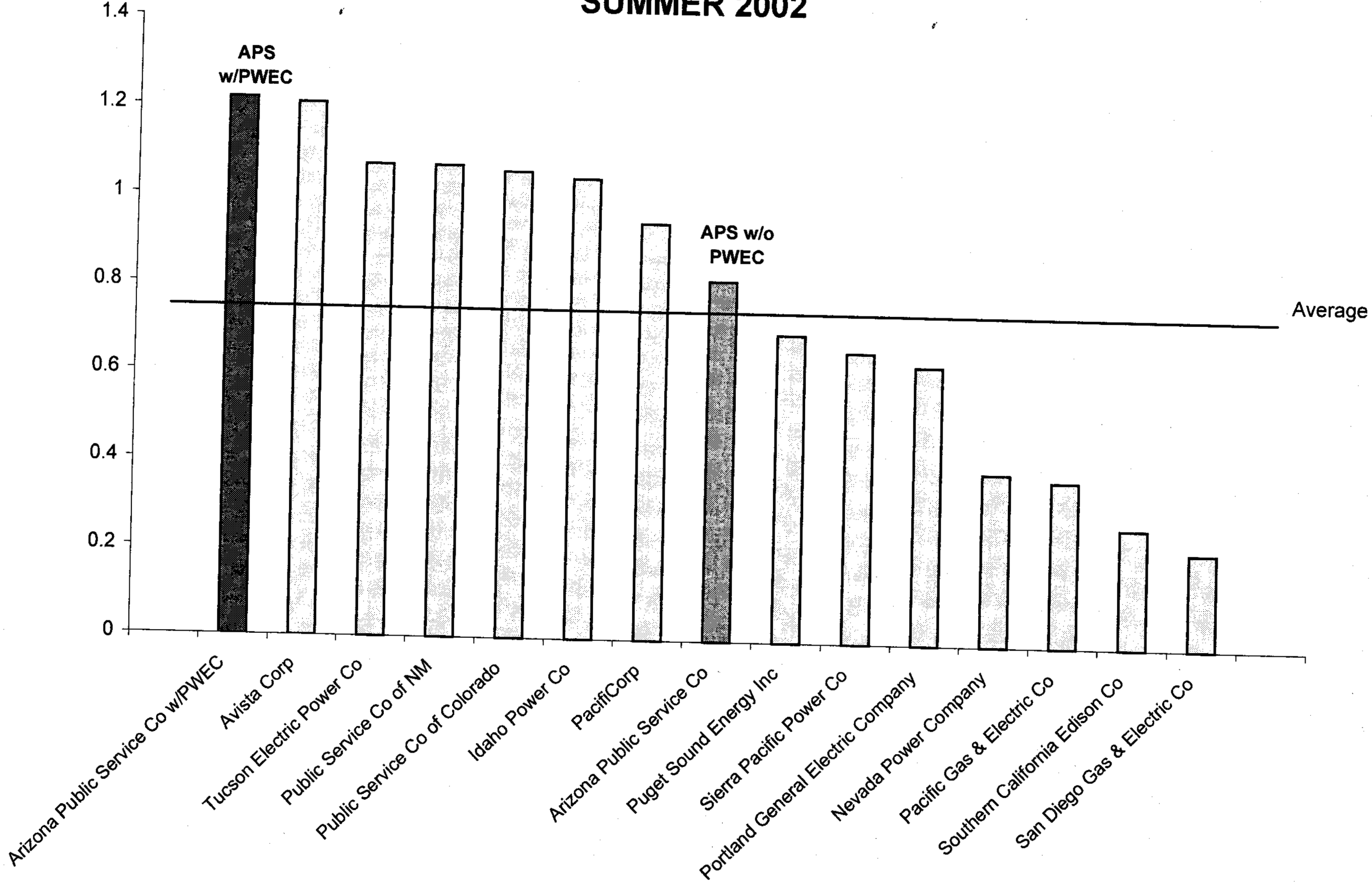
- Earnings
  - PWEC earnings steadily increase under re-regulation ($189-$300 Million)
  - PWEC earnings steadily increase under bi-lateral contract ($189-$368 Million)
  - PWEC earnings flat 2004 though 2009 under market scenario ($220-$245 Million)
  - PNW earnings based on Delivery receiving rate increase to retain 11.25% ROE each year

Exhibit JPK-9
PALO VERDE WHOLESALE FORWARD PRICES FELL SIGNIFICANTLY IN SPRING 2001



Source: TFS Energy.

Exhibit JPK-10
RATIO OF REPORTED CAPACITY TO PEAK LOAD FOR SEVERAL WESTERN U.S. INVESTOR-OWNED UTILITIES
SUMMER 2002



Sources: WECC Summary of Estimated Loads and Resources, EIA 860 Data, EIA 861 Data.