APS RESPONSES TO COMMISSION QUESTIONS
AT THE NOVEMBER 15, 2004 OPEN MEETING

1. *What factors led the Environmental Protection Agency (EPA) to issue its PCB rules and what did those rules require with respect to the phase-out of PCBs? Was APS required to be PCB-free by a certain date? Was that a factor in the design of the Westwing Substation? Was the issuance of the IEEE standard in 1984 related to the EPA PCB regulations?*

APS Response:

Polychlorinated biphenyls ("PCBs") are regulated by the Environmental Protection Agency ("EPA") under the Toxic Substances Control Act ("TSCA" or "the Act"), 15 U.S.C. §§ 2601-2629. TSCA was enacted in 1976 and, among other issues, provides EPA with the authority to limit or prohibit the manufacture, use, distribution, and disposal of existing chemical substances. TSCA specifically required EPA to regulate PCBs and established a legal presumption that PCBs pose an unreasonable risk to human health and the environment. EPA's PCB regulations are set forth at 40 C.F.R. Part 761.

The EPA regulations do not require APS (or any other utility) to be PCB-free by a certain date. Instead, the applicable regulations contemplate that most equipment in use that contains PCB will remain in place for their useful lives. However, owners of electrical equipment that contain regulated concentrations of PCB's are subject to numerous prohibitions, restrictions and use authorizations. For example:

- As of October 1, 1985, the use and storage for reuse of PCB Transformers that pose an exposure risk to food or feed is prohibited;

- As of October 1, 1985, the installation of PCB Transformers, which have been placed into storage for reuse or which have been removed from another location, in or near commercial buildings is prohibited;

- After October 1, 1988, the use of PCB Large High Voltage Capacitors and PCB Large Low Voltage Capacitors is prohibited unless the capacitor is used within a restricted-access electrical substation or in a contained and restricted-access indoor installation; and

- As of October 1, 1990, the use of network PCB Transformers with higher secondary voltages (secondary voltages equal or greater than 480 volts) in or near commercial buildings is prohibited.

APS has complied with each of the above requirements.

For electrical equipment that contains regulated concentrations of PCB's and is not prohibited by the above location-specific settings, EPA has established "use authorizations" that allow such equipment to continue to be used but impose certain recordkeeping, inspection, and location-specific operating requirements. APS has a comprehensive program in place for compliance with these requirements.

The Westwing Substation was constructed before the issuance of the PCB regulations. In addition, the Westwing Substation transformers never contained PCBs. Instead, they contained only mineral oil and therefore were not subject to the PCB regulations. We were unable to find any connection through our research between the issuance of the IEEE standard in 1984 and EPA's PCB regulations.

2. *Provide copies of the Spring 2003, Fall 2003 and Spring 2004 Navajo Transmission System Engineering and Operating Committee meetings.*

APS Response:

On December 2, 2004, APS provided to the Commission a response to this question. Attached at Tab A is a Joint Response from the Westwing Substation owners (APS, SRP, TEP and USBR) and the transmission agent for USBR (WAPA) to the January 3, 2005 letter from Commissioner Mayes to Mr. William Post (and others) that set forth additional questions regarding the contents of the Navajo Transmission Engineering and Operating ("E&O") Committee minutes. The Joint Response was prepared by representatives to the E&O Committee from each of the listed organizations, all of which are members of the E&O Committee, except WAPA, which attends at the request of USBR. In addition to providing the Joint Response, APS would like to take this opportunity to emphasize the following points concerning the record to date on E&O Committee activities that have been associated with the events of the past summer.

The structure and activities of the E&O Committee neither contributed to the cause of nor impacted the extent of the damage resulting from the July 4, 2004 transformer fire at the Westwing Substation. As detailed in the APS December 2, 2004 memorandum and the attached joint response, there were a number of reliability initiatives ongoing at the Westwing Substation that took priority over the installation of firewalls. All of the members of the E&O Committee have been fully supportive of APS as the Westwing Substation Operating Agent in approving all recommended reliability initiatives. Even if a decision had been made in September 2003 to install firewalls at the Westwing Substation, there would not have been sufficient time to complete the project design, implement an RFP, schedule the required outages, and complete construction to have the firewalls in place at the Westwing Substation for the summer of 2004.

The structure of the E&O Committee and its business practices and procedures fully support APS as the Operating Agent in its duty to reliably operate and maintain the Southern Navajo Transmission System, including the Westwing Substation. The E&O Committee meets formally on a regularly scheduled basis twice a year, once in the fall usually in September and once in the spring usually in April. Normal committee business is conducted during those meetings. On occasion, system reliability requires the E&O Committee to make a decision sooner than the next scheduled meeting. Equipment failure, equipment damage, or priority system enhancements, for example, could require E&O Committee action prior to the next regularly scheduled E&O Committee meeting. The E&O Committee is able to approve a necessary repair or improvement as a Capital Budget Item (CBI) using an expedited process through e-mail correspondence and telephone calls. Recently, this process has been conducted primarily by e-mail with telephone follow-up as necessary to expedite approvals. Emergency CBI approvals typically are received via e-mail and a copy of the CBI with the owners' E&O Committee representative signature may then be faxed to the E&O Committee chairman. When e-mail approval has been obtained from all owners, APS as the Operating Agent can take immediate action to implement the project. At the next regularly scheduled meeting, the formal signatures are then obtained on the CBI for records. Recent instances of the use of this process on the Navajo Transmission System include the following projects:

- Modification of relay communications between Crystal and Navajo on the 500kV line (January 2004).
- Installation of Gas in Oil Analyzer on WW T#1 (January 2004)
- Jack's Peak Commercial Power Project (February 2004).
- Replacement of failed 230kV Liberty line breaker at the Westwing Substation (June 2004).
- Replacement of Capacitor C6 at Moenkopi (December 2004).
- Addition of 3-DS3 Microwave System from Mt. Elden to Jack's Peak (December 2004).

The Committee also holds special meetings as required to conduct business where more detailed face to face discussion among the members is desired. For example, in September 2004, the owners held a special meeting to approve the purchase of seven new transformer units for the Westwing Substation in time to have them in service for the summer of 2005.

These methods of conducting Committee business between regularly scheduled meetings have been highly effective and the Committee has successfully supported APS as the Operating Agent in managing the Navajo Transmission System.

3. *Why were firewalls installed at the Four Corners Power Plant in 1993 but nowhere else?*

APS Response:

APS installed firewalls on the generator step up transformers at Units 1, 2 and 3 at the Four Corners Power Plant and at Units 2 and 3 at the Cholla Power Plant in the early to mid-1990s in response to a risk assessment that indicated such installations were important for personnel and equipment protection.

4. *How many APS major transmission facilities have firewalls? For those facilities that are co-owned, provide the names and ownership shares. If any facilities have firewalls, identify how long it took to install the firewalls.*

APS Response:

Attached at Tab B is a listing of the major transmission facilities owned or operated by APS. The document identifies the joint owners and ownership percentages for the facility (where applicable), as well as the fire mitigation measures in place at the site. Like SRP did in its response to this question, APS has defined "major transmission facility" to include extra-high voltage substations. In addition, set out in the following table is a summary of APS' current plans relating to fire protection at those major transmission facilities:

Substation/Switchyard Name	In-Service Date	Fire Protection Scheme
Moenkopi Switchyard	1969	No transformers - Adequate spacing between reactor banks. Considering firewalls/spacing for individual single phase reactors in each bank
Navajo Switchyard	1975	No transformers - Adequate spacing between reactor banks. Considering firewalls/spacing for individual single phase reactors in each bank
North Gila Substation	1983	Firewalls to be added with transformer addition in 2005
Westwing 500-kv Substation	1973	Firewalls to be added with transformer replacements in 2005 and 2006
Westwing 230-kv Substation	1986	Firewalls under consideration
Saguaro Substation	1954/1978	Adequate spacing between transformers
Four Corners Substation	1962	Firewalls added for transformer bank in 2005 Adequate spacing for other transformers / reactor banks Considering firewalls/spacing for individual single phase reactors in each bank
Yavapai Substation	1996	Adequate spacing between transformers
Preacher Canyon Substation	1981	Adequate spacing between transformers
Cholla Substation	1961	Firewalls under consideration
Pinnacle Peak Substation	1960s	Firewalls to be added with transformer replacement in 2005 Adequate spacing between transformers

5. *What is Rural Metro's ability to put out a fire today at Westwing?*

APS Response:

Our discussions with Rural Metro and the Phoenix Fire Department indicate that it would be challenging for most fire departments to effectively fight a fire of the size and complexity of the fire that occurred at the Westwing Substation. In order to enhance the ability of fire departments to respond to such a fire, APS has engaged in discussions with Rural Metro, the Central Arizona Life Safety Response System Council, and various Valley fire departments regarding coordination of fire protection service for the Westwing Substation and similar facilities. Currently, the parties are discussing a partnership under which Rural Metro would rely on the support from the City of Phoenix's foam trucks in responding to substation fires. APS is hopeful that those discussions ultimately will lead to a mutual aid agreement between the various fire fighting agencies, which would result in enhanced fire fighting capabilities throughout the Valley. In the meantime, however, APS has been working with the Phoenix Fire Department's Command Training Center to develop Standard Operating Procedures ("SOPs") for fighting electrical fires and to implement training for each of the Valley's fire departments, as well as fire departments throughout the state. The first phase of the training, which included a review of the Summer 2004 events and an analysis of the proposed SOPs, took place in Fall 2004. Two additional phases of training are scheduled to be completed in 2005. In March, an additional review of the SOPs and an overview of electrical issues will be done. Prior to June 2005, joint exercises with simulations of substation events will be completed.

6. *How long was the process from planning to implementation to replace the relays at Westwing on the Westwing-Liberty 230kV line?*

APS Response:

In March 2004, WAPA indicated to APS that it wanted to replace the relays on its 230kV Westwing-Liberty line. As the Operating Agent at the Westwing Substation, APS would replace the relays for WAPA at the Westwing Substation, while WAPA would replace the relays at Liberty. A Letter Agreement for the Westwing Substation relay change out was executed by WAPA and APS in April, 2004. The relay panels were ready for installation by APS in late June 2004. However, because WAPA indicated that it would need a three-week outage to complete other work on the line during the same time period, and both APS and WAPA wanted to avoid such a lengthy outage during the summer peak period, APS and WAPA agreed to schedule the relay change out for the fall of 2004. The work was completed in November 2004.

7. *APS indicated during the November Open Meeting that it already was taking follow up actions based on the Summer 2004 event. What actions has APS taken to date and what, if any additional actions will it take as result of the Summer events and the resulting investigation?*

APS Response:

During the November 2004 Open Meeting, APS indicated that we had a number of activities under way in response to the lessons learned from the Summer 2004 events. Specifically, the Company has added redundancy for primary and breaker-failure relaying at the Westwing Substation, changed out all of the 230kV line relays at the Westwing Substation to solid state, and installed additional relays to isolate the 500kV system from the 230kV system at the Westwing and Yavapai Substations and at the 69kV system at North Gila.

In addition, APS is currently reviewing all of the other 230kV and above substations that it owns or operates to ensure that there are no single points of failure in the protective relaying schemes that would result in a lack of redundancy or backup that could result in a local disturbance spreading to other areas.

APS started with the most critical 525kV substations and is now working through the rest of the 525kV substations. So far, the Company has completed the review and made recommendations for the Westwing, Yavapai, Navajo, and Moenkopi 525kV switchyards. Upon completion of the review of the 525kV yards, APS will review the 345kV and 230kV switchyards. Examples of upgraded protection schemes that APS will put in place as a result of the investigation include: (i) redundant bus differential schemes; (ii) redundant battery banks; (iii) backup separation schemes to separate the 525kV from lower voltages; and (iv) redundant lockouts.

APS plans to complete all of the reviews by May 1, 2005. The APS Reliability Analysis & Management department will then coordinate with the Transmission Projects department to schedule and complete the upgrades.

8. *Why were firewalls installed at Redhawk?*

APS Response:

Firewalls were constructed at Redhawk to provide protection to the generating station, which is consistent with current construction practices for such new projects. Similarly, firewalls were installed by PWEC at its West Phoenix CC4 and CC5 and Saguaro CT3 units. As indicated in the response to Question 3, APS has completed a review of its existing generating facilities and identified locations where firewalls should be added.