



Palo Verde Nuclear  
Generating Station

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102-05119-CDM/SAB/TNW/GAM  
June 17, 2004

ATTN: Document Control Desk  
U. S. Nuclear Regulatory Commission  
Mail Station P1-37  
Washington, DC 20555-0001

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Units 1, 2, and 3  
Docket Nos. STN 50-528/529/530  
Information Regarding PVNGS Offsite Power Grid Reliability**

In a telephone conference call on Thursday, June 17, 2004, to discuss the PVNGS offsite power grid reliability, Arizona Public Service Company (APS) agreed to submit to the NRC an engineering assessment regarding the expected grid stability had the three Palo Verde-to-Hassayampa 525 kV transmission lines not tripped during the June 14, 2004 loss of offsite power event. APS has concluded from the data provided below and the attached graph that the system would have remained stable, without loss of offsite power to the PVNGS units, if the three Palo Verde-to-Hassayampa 525 kV transmission lines had not tripped. Based on this conclusion, the negative sequence trip function for those lines, which caused them to trip during the June 14 event, is being removed. This trip function is accomplished by using a different method to detect an open pole condition.

#### Engineering Assessment

Attached is a graph showing the Palo Verde switchyard voltage during the initial 30 seconds of the June 14, 2004 grid disturbance. When the fault on the Westwing-to-Liberty 230 kV transmission line was initiated (time = 0 on the graph), the Palo Verde switchyard voltage was within its normal range (above 525 kV). Following the fault, the Palo Verde switchyard voltage trended downward, fluctuated, then stabilized around 500 kV. At about 12 seconds into the event, following tripping of the three Palo Verde-to-Hassayampa 525 kV transmission lines on negative sequence current, the voltage dropped significantly, and the resulting oscillations eventually led to tripping of the remaining 525 kV lines connected to the Palo Verde switchyard.

During the initial 12 seconds of the event, the Palo Verde switchyard voltage appeared to have stabilized at about 500 kV (95% of 525 kV). Operation at this level for a limited period of time (long enough for the fault to clear on its own or to allow for manual

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intervention) would not cause separation of the PVNGS safety buses from offsite power. This is because (1) the degraded voltage relays, which are used to transfer the PVNGS safety buses to the emergency diesel generators, are set at 90% of 4160 V, (2) the startup transformers boost the voltage 2-1/2%, and (3) the startup transformer loading is very light during normal plant operation.

Based on this data, APS concludes that if the three Palo Verde-to-Hassayampa 525 kV transmission lines had not tripped during the June 14, 2004 event, the PVNGS offsite power system would have remained stable long enough for the fault to have cleared on its own or by manual intervention.

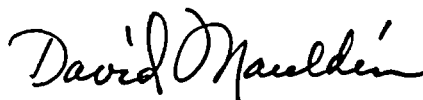
#### Follow up Action

APS understands that the Western Electric Coordinating Council (WECC) will conduct a detailed investigation of this event. APS will request that the investigation include a study to verify that the Palo Verde switchyard would have remained stable had the Palo Verde-to-Hassayampa transmission lines remained in service. APS will forward the findings of the study to the NRC when they become available.

No commitments are being made to the NRC by this letter. The follow up action above is a licensee-generated task.

Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,



CDM/SAB/TNW/GAM

Attachment: June 14, 2004 Event, Palo Verde Switchyard Voltage

cc: B. S. Mallett            NRC Region IV Regional Administrator  
M. B. Fields            NRC NRR Project Manager  
N. L. Salgado           NRC Senior Resident Inspector for PVNGS

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance

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**Attachment**

**June 14, 2004 Event,  
Palo Verde Switchyard Voltage**

# June 14, 2004 Event Palo Verde Switchyard Voltage

