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Brian Katz
Vice President

June 7, 2005

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

**SUBJECT: San Onofre Nuclear Generating Station, Units 2 and 3
Docket Nos. 50-361 and 50-362
Additional Information Regarding
Proposed Change Number (PCN) 561
Degraded Voltage Setpoints**

Reference: Letter from Brian Katz (SCE) to Document Control Desk (NRC), dated May 27, 2005, Subject: "San Onofre Nuclear Generating Station, Units 2 and 3, Docket Nos. 50-361 and 50-362, Proposed Change Number (PCN) 561, Degraded Voltage Setpoints"

Dear Sir or Madam:

The referenced letter (PCN-561) requested changes to Technical Specification (TS) Surveillance Requirement (SR) 3.7.3.3.a to revise the allowable values for the degraded voltage relays. During a phone call with the Nuclear Regulatory Commission (NRC) on June 3, 2005, additional information was requested regarding the basis for our request to review PCN-561 on an exigent basis.

Summary

During high summer load periods (such as would occur following July 1), should one San Onofre Nuclear Generating Station (SONGS) unit shut down, it is highly likely that the offsite transmission grid will not be able to support operability of the offsite source of power for the remaining unit at a switchyard voltage of approximately 222 kV (subsequently referred to as 222 kV). As described in detail below, the only actions available would likely be to shed offsite transmission loads, or to shutdown the remaining SONGS unit.

An unplanned shutdown or trip of a SONGS unit adds additional stress to the grid which routinely operates near full capacity during the peak summer load period. The forced shutdown of the remaining SONGS unit would further stress the grid which could also result in the shedding of additional offsite transmission loads via rotating blackouts.

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ADD 1

Approval of PCN-561 will allow Southern California Edison (SCE) to re-establish 218 kV as the minimum switchyard voltage necessary to support operability of the offsite power sources. As described below, this will allow the offsite transmission grid to remain OPERABLE should one SONGS unit shutdown during the high summer load period. Therefore, exigent review and approval of PCN-561 will avoid the potential for rotating blackouts.

SCE is preparing to implement the approved TS starting on July 5, 2005.

Additional Information requested by the NRC

- 1) Describe how the Grid Operator uses nomograms to determine switchyard voltage, and
- 2) provide a description of the actions available to maintain acceptable post-trip switchyard voltage, and
- 3) provide a description of the effect of the shutdown of both SONGS units during a high summer load period, and
- 4) discuss the schedule to implement the final proposed change described in PCN-561 (218 kV option).

Background

SCE is currently utilizing 222 kV as the minimum voltage necessary to support operability of the immediate access offsite power source. Whenever one San Onofre Nuclear Generating Station (SONGS) unit is shut down, the SCE Grid Operator must notify SONGS if, following a trip of the remaining unit (limiting case), the switchyard voltage is forecast to drop below 222 kV and not recover within 2.5 seconds. As discussed with the NRC on June 3, 2005, there are difficulties in maintaining the limiting case switchyard voltage above 222 kV. As a result, should one San Onofre Unit shut down during a high summer load period, the offsite power sources would likely be declared inoperable, eventually forcing the shutdown of the remaining unit.

PCN-561 revises the allowable values for the degraded voltage relay setpoints. Approval of PCN-561 will allow SCE to re-establish 218 kV as the minimum offsite grid voltage necessary to support operability of the immediate access offsite power source.

Nomogram Usage

The plan for the summer of 2005 is to operate both SONGS units. Should one SONGS unit be forced to shutdown, the remaining SONGS unit will maintain the SONGS switchyard above the minimum required voltage.

With one unit off line, it becomes necessary to know what the SONGS switchyard voltage will be should the remaining SONGS unit trip. The SCE Grid Control Center (GCC) has performed, and maintains current, computer studies that predict SONGS switchyard voltage subsequent to a trip of the remaining SONGS unit. Inputs to these studies are power import level into the SCE and San Diego Gas and Electric (SDG&E) local area, generation adjacent to SONGS that is off line and any critical transmission line(s) that are out of service. The output of these studies is an acceptable region of VAR flow to and from the SONGS switchyard. These studies are visually shown with a limit line on an X-Y plot with the North of SONGS (NOS) MVAR flow on the Y-axis and the South of SONGS (SOS) MVAR flow on the X-axis. The set of these visual representations become nomograms which are used to configure the grid to provide the required voltage at the SONGS switchyard.

Maintaining the post trip voltage in the SONGS switchyard above the minimum required is dependent on whether sufficient local generation is on line providing the necessary VAR support to the grid configuration at that time. VAR flows under the limit line in the nomogram predict SONGS post trip switchyard voltages will be above minimum requirements.

Whenever one SONGS unit is off line, the Independent System Operator (ISO), or GCC as directed by the ISO, will perform an evaluation of grid conditions to determine whether or not the SONGS switchyard voltage is forecast to remain above requirements subsequent to a trip of the remaining unit. The applicable nomogram is reassessed at least once per hour.

If the grid operating point cannot be put back into the acceptable region of the nomogram, the SONGS control room is notified that the critical system conditions are sufficient to cause the SONGS off site power source to be considered inoperable. SONGS control room personnel would then enter the appropriate Tech Spec 3.8.1 or 3.8.2 Condition.

Potential Mitigative Actions

The GCC manipulates the grid operating point back to the acceptable portion of the nomogram using some or all of the following:

- Switch on available shunt capacitors in the SCE/SDG&E area
- Increase VAR output of on line generation adjacent to SONGS
- Adjust 500 to 230 kV transformer taps in the southern portion of the SCE area
- Connect additional local area generation to the grid
- Reduce imports into the SCE/SDG&E area
- Expedite return-to-service of critical lines that are out of service

Attachment 1 shows the SONGS switchyard VAR operating points from the summer 2004 period (June 1 to Sept 30) with respect to the three levels of required switchyard voltage described in PCN-561. The nomogram lines in Attachment 1 are controlled by

the level of SCE/SDG&E area imports, nominally 10,000 MW, and any generation adjacent to SONGS that is not on line. The three nomogram lines in Attachment 1 depict 10,000 MW of imports and the plan to have all generation adjacent to SONGS on line during the high summer load periods:

- Green = 218 kV
- Blue = 219.5 kV
- Red = 222.2 kV

The locus of the 2928 hourly historical operating points is centered approximately around $SOS = -50$ MVAR and $NOS = +250$ MVAR. A statistical evaluation of these historical operating points shows the following at the specific voltages studied:

Voltage Requirement	Points inoperable	Inoperable period in Hours
222.2kV	64.0%	1875
219.5kV	1.7%	50
218.0kV	None	None

A sensitivity study was performed to determine how to move the 0,300 MVAR point, which provides 219.5 kV, to a point where 222.2 kV would be provided. During heavy load conditions, all available generation in the SCE/SDG&E area is already operating and at nearly full output severely limiting the ability to decrease imports into the SCE/SDG&E area. In this scenario, load reduction would be the only option left. The sensitivity study shows that moving the operating point below the 222.2 kV nomogram (along the pink dotted line) would require approximately 1000 MW of load reduction (the analysis split the load reduction 80/20 between SCE and SDG&E) during the peak load period of the day (1pm to 6pm).

Load reduction would be accomplished by first using interruptible loads (Air Conditioner cycling, Agricultural Pumps, and customers who agree to curtail load within 30 minutes when called in exchange for a lower KWH charge) which are nominally around 1200 MW. If this amount of load had already been utilized in responding to a system disturbance (such as a trip or shutdown of the first SONGS unit), then only firm load would be left to shed. Firm load is shed using an automated load shedding program that drops pre-selected distribution circuits so as to minimize outages to "essential-load" customers such as hospitals, police departments, city halls, airports, etc.

Shedding of 1000 MW of firm load is estimated to affect approximately 800,000 customers in Southern California.

Further evaluation of the sensitivity study shows that approximately 600 MW of load would need to be shed to move an acceptable point on the 218.0 kV nomogram to a point where 219.5 kV would be provided.

A complete set of parametric studies has been completed at 218 kV which shows that only 11 critical line outages require specific VAR flows to and from the SONGS switchyard with one SONGS unit shutdown.

Effect of shutdown of both SONGS units during a high summer load period.

The loss of both SONGS units during a high summer load period would also result in the need to shed approximately 1100 MW of load. As described above, this would first be accomplished using interruptible loads. If this amount of load had already been utilized, then only firm load would be available to be shed. Shedding of 1100 MW of firm load is estimated to affect approximately 880,000 customers in Southern California.

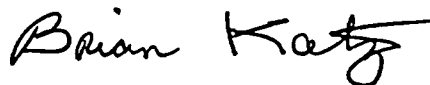
Schedule for implementation of the 218 kV option

PCN 561 stated that SCE may not be ready to implement the final proposed allowable values by July 1, 2005. Because of this, PCN 561 proposed interim allowable values that will allow SCE to establish 219.5 kV as the minimum offsite grid voltage. These interim allowable values would only be in effect until SCE is able to implement the final proposed allowable values.

The modifications and testing that are necessary to implement both the proposed interim option (219.5 kV) and the proposed final option (218 kV) are described in PCN-561. SCE is making every effort to ensure that all actions necessary to implement the final proposed option (218 kV) will be completed by July 1, 2005. This will allow SCE to implement the final proposed option (218 kV) starting on July 5, 2005. If the final proposed option is not ready for implementation, the interim proposed option (219.5 kV) will be implemented.

If you have any questions or require additional information, please contact Jack Rainsberry at (949) 368-7420.

Sincerely,



cc: B. S. Mallett, Regional Administrator, NRC Region IV
C. C. Osterholtz, NRC Senior Resident Inspector, San Onofre Units 2 & 3
B. M. Pham, NRC Project Manager, San Onofre Units 2 and 3

Attachment 1

VAR Flow Historical Data

June 1 through September 30, 2004

VAR Flow Historical Data, June 1-Sept. 30, 2004

