

From: David Loveless
To: Millard Wohl
Date: Thu, Jun 24, 2004 1:50 PM
Subject: Re: Palo Verde LOOP

Millard,

How are you, bud? Haven't talked in a while.

I'm the lead on the analysis of this. Also, Don Marksberry's group and Pat O'Reilly are helping out. Please let me know what you are doing, so that we don't overlap or at least can share resources. The answers to your questions are as follows:

1) Root cause (if known) of LOSP

Loss of station power was initiated by a fault on the 230 kV portion of the grid about 45 miles from Palo. A bad relay prevented the fault from being isolated at the 230 kV side and it was transferred through 3 transformers to the 525 kV grid. The grid survived for 24 seconds until a negative sequence relay isolated Palo switchyard from the rest of the generation on that part of the grid. The Palo switchyard tripped on high impedance (current) and all three units tripped.

2) Number of combustion turbine generators (CTGs) in adjacent yard

There are 2 GTGs. I have INEEL designing a fault tree as we speak. Give me a call for the specifics.

3) Number of CTGs that started

--Number of CTGs that were made available to the plant electrical system and by what means (automatic, manual)

Both GTGs were started manually by an onsite crew and were ready to load at about 15 minutes. They were never tied to vital switchgear.

4) Have the CTGs been added to the plant PRA model and, if so, is common cause failure modeled (including CCF w/EDG(s))?

Don't know, but we are modeling them in SPAR.

5) Reason(s) for no voltage/ampereage being registered for EDG considered failed

The EDG started, tied and was sequencing when a diode in the reference voltage circuitry failed and exciter voltage dropped to zero.

6) Any attempts made to cross-connect EDGs before shutting down all three PVNGS units?

cross-connect EDGs? Always had safety-power, so all efforts were to restore offsite power.

Give me a call,

David 817-860-8161

CC: Nancy Salgado

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