

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 5 2 8	PAGE (3) 1 OF 0 3
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TITLE (4)

Reactor Trip Caused When A Synchronization Check Blocked The Transfer Of Non-Essential Loads During Testing

EVENT DATE (5)				LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)							
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)							
0	1	0	9	8	6	8	6	0	0	6	0	5	0	0	0		
											0	5	0	0	0		

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)															
POWER LEVEL (10) 0 1 0 1 0	20.402(b)				20.405(c)				<input checked="" type="checkbox"/> 50.73(a)(2)(iv)				73.71(b)			
	20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				73.71(c)			
	20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 386A)			
	20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(vii)(A)							
	20.405(a)(1)(iv)				<input checked="" type="checkbox"/> 50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)							
20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)								

LICENSEE CONTACT FOR THIS LER (12)

NAME William F. Quinn, Manager - Nuclear Licensing (extension 4087)	TELEPHONE NUMBER AREA CODE 6 0 2 9 4 2 - 7 2 0 0
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPD

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At approximately 1325 on January 9, 1986, Palo Verde Unit 1 was in Mode 1 at 100 percent reactor power when a turbine trip and subsequent reactor trip was to be initiated as a scheduled part of the power ascension testing program.

The turbine trip was initiated by manual actuation of the unit differential generator protection relay. The 525 kV generator output breakers opened as expected, but the non-essential station loads did not automatically fast-transfer to the offsite power source. This resulted in a loss of power to the Reactor Coolant Pumps and a reactor trip was generated by the Core Protection Calculators from a flow projected Low Departure from Nucleate Boiling Ratio.

During the event, one Main Steam Safety Valve opened and an excessive cooldown occurred that resulted in a Main Steam Isolation Signal actuation. During the event, the Reactor Coolant Pumps (RCP) coasted down slightly faster than the rate assumed in the safety analysis.

On January 13, 1986, it was determined that the RCP coastdown rate was a condition outside the design basis assumed in the safety analysis.

As a result of this event: the application of the synchronization check relay is to be evaluated; Licensed Operators have been instructed on how to respond to a loss of power to the Steam Bypass Control System instrument panels; and a penalty factor has been added to the Core Operating Limit Supervisory System.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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			0 0 6	0 0	0 2	OF	0 3

TEXT (If more space is required, use additional NRC Form 366A's) (17)

At approximately 1325 on January 9, 1986, Palo Verde Unit 1 was in Mode 1 at 100 percent reactor power, with a Reactor Coolant System (RCS) (AB) pressure of 2250 psia and a cold leg temperature of 565 degrees F, when a turbine trip and subsequent reactor trip was to be initiated as a scheduled part of the power ascension testing program.

The turbine trip was initiated by manual actuation of the unit differential generator protection relays to simulate a fault on the main generator (TB). The simulated fault was intended to open the main generator output breakers and cause the non-essential station loads to automatically fast-transfer to offsite power sources. The main generator output breakers and unit auxiliary transformer breakers opened as expected, but the station loads (including reactor coolant and circulating water pumps) did not fast-transfer to the offsite power source. A reactor trip was generated by the Core Protection Calculators (CPC) (IG) from a flow projected Departure from Nucleate Boiling Ratio (DNBR) because the Reactor Coolant Pumps (RCP) speed was decreasing due to a loss of power.

When the turbine was tripped, the Steam Bypass Control Valves (SBCS) (JI) received a quick open signal, but reclosed almost immediately due to the loss of power to the instrument panels. Power was quickly restored to the SBCS instrument panels, due to an automatic transfer to the Class IE power supply. Steam generator pressure increased for about 1 second until one Main Steam Safety Valve (MSSV) lifted and remained open for approximately 43 seconds before reseating. As the MSSV resealed, one SBCS valve modulated to 100 percent open and another to 80 percent open. Four other SBCS valves modulated slightly open. The SBCS valves remained open for approximately 45 seconds with a subsequent period of oscillation (3 open-close cycles) over about 40 seconds. A control room operator took manual control of the individual SBCS valves in an attempt to control the secondary system induced cooldown event. At approximately the same time, a Main Steam Isolation Signal actuation (MSIS) (JE) occurred due to low Steam Generator pressure. The MSIS terminated the cooldown and the RCS cold leg temperature reached 540 degrees F. RCS pressure subsequently increased (due to decay heat) and reached 2357 psia prior to the operator re-establishing a cooldown using atmospheric dump valves, and the essential motor driven auxiliary feedwater pump.

Power was restored to the non-essential busses at 1328. The non-class cooling pump load centers were the first to be manually restored. At 1337, the Shift Supervisor declared a NOTIFICATION OF UNUSUAL EVENT and made the appropriate notifications. RCP 1A was restarted at 1408 and RCP 2A at 1411. The NOTIFICATION OF UNUSUAL EVENT was terminated at 1452.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO 3150-0104

EXPIRES: 8/31/98

FACILITY NAME (1) Palo Verde Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 5 2 8	LER NUMBER (6)			PAGE (3)	
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

As a scheduled part of testing, an automatic fast-transfer of power sources was expected to occur and the reactor was to trip on high pressurizer pressure. The fast-transfer did not occur due to a frequency mismatch between the unit auxiliary transformers and the offsite power sources. This mismatch caused the synchronization check relay to properly block the transfer from occurring, per design. This prevented the transfer of power sources from occurring and the CPC's projected a Low DNBR condition due to the decrease of RCP shaft speed that resulted from the loss of power.

An evaluation is being conducted on whether to remove the synchronization check feature of the fast bus transfer. Non-essential station electrical loads will be maintained on the startup transformers until the evaluation and testing is completed to determine if design changes are necessary to improve bus transfer reliability.

An RCS cooldown was experienced after the turbine trip to the point where a MSIS occurred. The SBCS valves closed when their instrument panels lost power, and reopened when the panels regained power. The SBCS Valves performed per design, but the loss of power and subsequent restoration of power caused the SBCS Master Controller to go into manual. When power was restored to the instrument panels the SBCS valves opened to the position that the Master Controller locked on to as it regained power.

Licensed Operators have been instructed on how to respond to a Loss of Power to the SBCS instrument panel.

During the event, data was being taken on the shaft speed of the RCP's as part of the testing program. The data showed that the RCPs coasted down slightly faster than the rate assumed in the safety analysis. This resulted from the electrical braking influence of other station electrical loads on the RCP busses. After analysis of the RCP data by the Nuclear Steam Supply System (NSSS) vendor, it was determined at approximately 0920 on January 13, 1986 that the RCP coastdown rate was a condition outside the design basis assumed in the safety analysis. This was reported to the NRC Operations Center via the Emergency Notification System on January 13, 1986, at 1154.

A penalty factor was added to the Core Operating Limit Supervisory System (COLSS), which accommodates for the effects of the observed RCP coastdown rate, so that all conclusions of the Safety Analysis remain valid. When COLSS is out of service, a term in the CPCs will also be changed to accommodate the different RCP coastdown rate. The NSSS vendor is performing an evaluation which may justify reducing the penalty factor.

A similar reactor trip occurred on September 12, 1985, when a fast transfer of power sources did not occur properly. This event was reported in LER 528-85-063.

The CPCs generated a reactor trip, per design, to ensure an acceptable DNBR margin. No safety limits were violated, no fission product barriers were challenged, and no radioactive releases occurred as a result of the event. Therefore, there was no impact on the health and safety of the public.



Arizona Nuclear Power Project

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February 10, 1986
ANPP-34972-EEVB/SGB/98.05

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 1
Docket No. STN 50-528, License No. NPF-41
Licensee Event Report - 86-006-00
File: 86-020-404

Dear Sirs:

Attached please find Licensee Event Report (LER) No. 86-006-00 prepared and submitted pursuant to 10 CFR 50.73. In accordance with 10 CFR 50.73(d), we are here-with forwarding a copy of the LER to the Regional Administrator of the Region V Office.

If you have any questions, please contact me.

Very truly yours,

E. E. Van Brunt, Jr.
Executive Vice President
Project Director

EEVB/SGB/rw
Attachment

cc: J. B. Martin (all w/a)
R. P. Zimmerman
A. L. Hon
E. A. Licitra
A. C. Gehr
INPO Records Center

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