

Item: 2715749 - CRDR

Problem Identification

WMCRFORM

Item No : 2715749

Unit : A

Classification :

Status : CLASSIFY

Type/Sub : CRDR

Source Type/Item :

Report Date : 6/14/2004

Title :

Identified By : CROZIER*DAVID W

Due Date :

Eval Due Date :

Resp Group :

Resp Org :

Assigned To :

Discovery Date/Time : 06/14/2004 07:54

Need Date :

Control Rm Review : Y

Source Doc / Type :

Legacy Item / Type :

Attachments : Y

Description : On June 14, 2004 all three units at Palo Verde experienced automatic reactor trips coincident with a grid disturbance. Unit two declared an Alert while both Unit One and Unit Three declared a Notification of Unusual Event (NUE). Several issues were identified with the emergency reponse organization response to the events. A significant root cause investigation should be performed to determine the root cause(s) and any associated corrective actions.

Initiators Suggested Disposition

| Added On | Added By | Comment Text |
|-----------|-----------------|--|
| 6/14/2004 | CROZIER*DAVID W | SIGNIFICANT HESSER - Rx Trip 90DP-0IP10 Criteria 1a,c,f, 7, 10a,c,f, & 15. This is at the request of the OPS Director, Plant Manager, VP Eng & Spprt, and the Chief Nuclear Officer. |

Requirement(s) Violated

| Added On | Added By | Comment Text |
|-----------|-----------------|---|
| 6/14/2004 | CROZIER*DAVID W | 10CFR 50.48, and Appendix E, NUREG 0654, PVNGS EPLAN, |

Recommend Closure: NO

D
8/18

Leaders Review

| Added By | Added On | Type | Comment Text |
|-----------------|-----------|--------------------------|--|
| CROZIER*DAVID W | 6/15/2004 | LDRS CAUSE | To be determined by the Root Cause evaluation. |
| CROZIER*DAVID W | 6/15/2004 | LDRS DESCRIPTION | See CRDR description. Also see attached media for details and recommendations. |
| CROZIER*DAVID W | 6/15/2004 | LDRS SUG DISPOSITION | SIGNIFICANT HESSER |
| CROZIER*DAVID W | 6/15/2004 | LDRS TRANSPORTABILITY | To be determined by the Root Cause investigation. |

Control Room Review

| Added By | Added On | Comment Text |
|-------------------|-----------|--|
| GAFFNEY*TIMOTHY J | 6/15/2004 | The described condition has no impact upon operation of the Units with relation to system availability. No Technical Specifications are impacted and no LCO entry is required. No further reportability issues have been identified for the condition. No further notifications are required at this time. |

Event Condition

| Unit | Power Level | OP Cond | Description |
|------|-------------|---------|---------------------------|
| A | 100 | 1 | Power greater than 5% RTP |

Action Taken

| Date/Time | Action Taken By | Action Taken Summary |
|-----------------|-----------------|---|
| 6/14/2004 22:30 | CROZIER*DAVID W | MRT held in Unit 2 on June 14, 2004. Info gathered from Units 1-3 CR's, OSC, TSC, EOF. |
| 6/14/2004 22:32 | CROZIER*DAVID W | Interviews conducted with Terry Radtke-OPS Director, Frank Buckingham-OPS Site Shift Mngr, Dave Burns U2 Shift Manager, Tim Gaffney Unit One STA, Lori Webb OPS Tech, Steve Banks U3 STA. Mtg. held with Dave Mauldin, Jim Levine, Dave Smith, Dwayne Carnes re: EP issues. |
| 6/15/2004 0:27 | CROZIER*DAVID W | Draft Significant Charter completed, to be reviewed (per T. Radtke) at next MRT mtg. 0700 6/15/04. |

Attached Media

| Description | Created By | Create Date | Attached Step |
|-------------------------------|-----------------|-------------|---------------|
| Unit 1-3 Selected Log Entries | CROZIER*DAVID W | 06/15/2004 | Identify |
| Summary and Issues | CROZIER*DAVID W | 06/15/2004 | Identify |

Other Related Work Items

| Item ID | Type | Sub Type | Description | Status |
|---------|------|----------|--|----------|
| 2715669 | CRDR | | During an emergency fire response to U-1 on 06/14/2004 at 0850 hrs the Sally port MUOV arm 1EQFNJYFG10B could not be opened due to the offsite power failure. The fire truck waited at least 10 minutes in the sally port waiting for the arm to | EVALUATE |

Workflow History Details

| Person | Work Assignment | Action/Status | Date | Comment |
|-------------------|---------------------|---------------|------------|-----------------------|
| GAFFNEY*TIMOTHY J | CRDR CRI | CONTROL RM | 06/15/2004 | <no comment provided> |
| CROZIER*DAVID W | 9631 EMRGY PLANNING | LDR REVIEW | 06/15/2004 | <no comment provided> |
| CROZIER*DAVID W | 9631 EMRGY PLANNING | IDENTIFY | 06/15/2004 | <no comment provided> |
| CROZIER*DAVID W | 9631 EMRGY PLANNING | IDENTIFY | 06/15/2004 | <no comment provided> |
| CROZIER*DAVID W | | REPORT | 06/14/2004 | <no comment provided> |

UNIT 1 SHIFT CREW C

SM: Mike Sanchez
CRS: Larry Wherry
RO: Dan Armour
CO: Brian Zmerzlikar
FTA: Chuck Pryor
Area 1: Fred Erdelji
Area 2: Mike Wickham
Area 3: Ken Smith
Area 4: Les Hughes
RW: Leo Bond
DEMIN: Don Baird
STA: Tim Gaffeny
NRC Comm: Jim Moreland
Shift Tech: Lori Webb
STSC Comm: Lori Webb
E-Plan AO:
Chemistry: Dan Dieterding
Effluent: Phylis Smith
RP Tech: Dan Dwan
Extra RO: Mark Sharp

UNIT 2 SHIFT CREW C

SM: Dave Burns
CRS: Robert Carbonneau
RO: Lou Berberich
CO: Roger Miller
FTA: Chuck Pryor
Area 1: Walt Parker
Area 2: John Russo
Area 3: Armando Salgado
Area 4: Rich Mason
RW: Leo Bond
DEMIN: Bobby Castillo
STA: Jim Moreland
NRC Comm:
Shift Tech: Lori Webb
STSC Comm: Lori Webb
E-Plan AO:
Chemistry: Bert Engstrom
Effluent: Paul Rein
RP Tech: Harvey Bowman

UNIT 3 SHIFT CREW D

SM Larry Speight
CRS Rick Byers
RO Jim Weedman
CO Scott Brzezinski
CO Glen Robinson
FTA Glen Robinson
Area 1 Herb Deal
Area 2 Gary Cummings
Area 3 Leonard Benally
Area 4 Angel Delgadillo
AOIT Dianna Galvan
RW George Schmitendorf
Demin Kevan Guilford
STA Steve Banks
NRC Comm Jim Moreland
Shift Tech Lori Webb
STSC Comm Lori Webb
E-plan AO
Chemistry Terry Parrill
Effluent Jerry Bolyard
RP Tech Becky Schreiber
CLC / LSRO not manned

Unit 1-3 Selected Log Information

Unit 1

07: 43 CR received indications of a grid disturbance followed by loss of voltage on the grid and subsequent reactor trip.

07: 48 Completed Standard Post Trip Actions. Diagnosed Loss of Offsite Power/Loss of Forced Circulation. Both Diesel Generators started and to supply the ESF Buses. OPS entered 40EP-9EO07 "Loss of Offsite Power/ Loss of Forced Circulation" Emergency Operating Procedure.

07: 52 CR manually initiated MSIS IAW LOOP/LOFC EOP.

07: 57 CR completed first round of Safety Function Status Checks. No Safety Functions were found in jeopardy. Safety Function Status Checks for LOOP/LOFC assessed on a 15 minute frequency.

07: 58 CR declared E-Plan Classification Notice of Unusual Event based on PVNGS emergency status code 2-1 for Loss of All Offsite Power to Essential Busses for Greater than 15 Minutes. No protective actions required.

08: 40 CR completed 1-hour ENS Notification to the NRC for declaration of ALERT in Unit 2 due to Loss of Offsite Power and ESF Electrical Busses reduced to a single source. Units 1 and 3 declared an NUE due to the Loss of Offsite Power. Bill Gott was the NRC official notified.

08: 55 CR states smoke was reported on the 120 Ft of the Aux. Building. Area Operator was dispatched to investigate. The area operator determined that there were fumes on the 120 Ft of the Aux. Building, but no fire exists. This assessment was later confirmed by other sources after a walkdown of the building. It is suspected that the fumes were caused by elevated temperatures at the letdown heat exchanger.

09: 00 CR identified that Letdown Heat Exchanger Outlet Temperature was off-scale high on controller CHN-TIC-223 and letdown was still in service without Nuclear Cooling Water available to the heat exchanger. Manually isolated letdown by closing Regenerative Heat Exchanger Isolation Valve CHB-UV-523. When Nuclear Cooling Water flow was lost to the letdown heat exchanger, CHB-UV-523 had not automatically isolated due to installation of T-MOD 2594804 which installed a jumper to disable the low flow trip. CRDR 2715667 initiated to document the condition. CR entered 40AO-9ZZ05, "Loss of Letdown".

10: 26 CR notified that the TSC has been activated.

12: 07 CR advised that the Emergency Coordinator in the TSC terminated the Notification of Unusual Event.

12:30 NRA made updated ENS from CR. Licensing made follow-up ENS notification to the NRC.

12: 31 CR reports the offsite power grid had several perturbations over approximately one hour following the event and has been stable since then. LCO 3.8.1, AC Sources - Operating, was entered in each unit as a result of this event. Heat removal is to atmosphere via atmospheric dump valves in natural circulation. Main steam safety valves may have lifted for a brief time. Restoration of forced reactor coolant circulation is pending assurance that the offsite power grid can reliably support the load. No major equipment was inoperable prior to the event that contributed to the event.

All 3 units are stable at normal operating temperature and pressure in Mode 3. The event did not result in any challenges to fission product barriers and there were no adverse safety consequences as a result of this event. The event did not adversely affect the safe operation of the plant or the health and safety of the public. The Resident Inspector was informed of the event and is on site.

Unit 2

07: 41 Reactor Trip due to grid disturbance and subsequent loss of Off Site Power. CRDR 2715709 initiated.

07: 50 completed Standard Post Trip Actions. Diagnosed Loss of Offsite Power/Loss of Forced Circulation. B Diesel Generator started to supply the 'B' ESF Bus. A Diesel Generator started and its output breaker was closed, however no output voltage was evident on the bus and the A Diesel was emergency stopped. OPS entered 40EP-9EO07 "Loss of Offsite Power/ Loss of Forced Circulation" Emergency Operating Procedure.

07: 51 manually initiated a MSIS. Performed: 40EP-9EO07 Section step 6 LOSS OF OFFSITE POWER/LOSS OF FORCED CIRCULATION

07: 54 declared E-Plan Classification EAL of Alert based on PVNGS emergency status code 2-3 for Loss of All Offsite Power to Essential Busses for Greater than 15 Minutes and one 4.16 KV bus is powered from a single offsite power source. No protective actions were required.

09: 51 E-Plan Classification EAL of Alert was exited.

Unit 3

07: 40 Reactor Trip on apparent loss of offsite power - low RCS flow. Apparent problem with SBCS valve 1003 caused SG pressure- low and subsequent MSIS actuation. Performed SPTAs and entered ORP 40EP-9EO07, Loss of Offsite Power/Loss of Forced Circulation.

09: 14 cross connected EW"A" with NC. Performed: 40EP-9EO10 Section 63 STANDARD APPENDICES

EVENT SUMMARY

On June 14, 2004, at approximately 07:44 Mountain Standard Time (MST) all three units at the Palo Verde Nuclear Generating Station experienced automatic reactor trips coincident with a grid disturbance and loss of offsite power in the Palo Verde Switchyard. Unit 2 declared an ALERT Emergency Plan classification at approximately 07:54 due to a loss of AC power to essential buses reduced to a single power source for greater than 15 minutes such that any additional single failure would result in a station blackout. Subsequently, at 09:51 Unit 2 downgraded the Emergency Plan classification to a NOTIFICATION OF UNUSUAL EVENT when AC power was restored from a single essential bus to both essential buses. Units 1 and 3 declared a NOTIFICATION OF UNUSUAL EVENT due to a loss of offsite power to essential buses for greater than 15 minutes. The NOTIFICATION OF UNUSUAL EVENT was terminated in all 3 units at 12:07 MST.

Unit 1 and 2 manually initiated a Main Steam Isolation System ESF actuation by procedure. Unit 3 received an automatic Main Steam Isolation System ESF actuation.

Due to the loss of offsite power, the Emergency Plan Technical Support Center (TSC) was unavailable. The Unit 2 Satellite TSC was to be staffed by the Emergency Response Organization in response to the loss of assessment capability. Power to the TSC has since been restored.

The Emergency Plan ALERT declaration includes staffing of the Joint Emergency New Center to address expected media interest.

All three units were at normal operating temperature and pressure prior to the trip. All CEAs inserted fully into the reactor cores. All Emergency Diesel Generators (EDGs) (2 per unit) associated with each of the 3 units started as expected in response to the loss of offsite power to their safety buses. Unit 2's train "A" EDG started, but did not indicate volts or amps and was manually shutdown.

EMERGENCY PLAN ISSUES:

- 1) Apparent miscommunication between Unit One and Unit Two resulted in the Unit Two Alert and Unit Three NUE being communicated via the NAN message but the Unit One NUE was not included in a NAN message. During interviews it was determined that Unit One originally planned to communicate their NUE however Unit Two stated they were assuming site EP communication responsibilities. Meanwhile, Unit Two entered into an Alert and the EC focused on the higher event and failed to include the Unit One NUE. Unit Three did communicate their NUE via a NAN message. This was discussed with the ERO who were involved.

RECOMMENDATION: ERO were coached. Include in lessons learned. Evaluate strengthening procedures for multi-unit events.

- 2) The Pager system notified Key ERO however the auto-dialer system was not utilized to notify non-key augmented personnel. The shift manager stated he did not activate the auto-dialer because at the time he believed site staff were onsite (he believed it was a normal work day at Palo Verde). The Site Manager had been working midnight shift and was just recently working days. He was not readily cognizant that Monday is not a normal work day at Palo Verde.

RECOMMENDATION: This was discussed with the U2 Site Manager. Recommend EP evaluate if there is a procedure enhancement or training enhancement to deal with multi-unit events and how to best manage them. Evaluate if there should be an independent or second check on a decision not to perform key or critical steps in the EPIP, i.e. not activating the auto-dialer.

- 3) The NAN phones did not work in Units Two and Three. This MAY be from the loss of power. The NAN messages were made via the back-up (radio) NAN.

RECOMMENDATION: IS to evaluate design. If there was supposed to be backup power, why didn't it work?

- 4) TSC Diesel generator did not function. This impacted the ability to staff the TSC and caused the VBS arm to fail which delayed the fire department in responding to a reported fire in Unit 1.

RECOMMENDATION: Investigate why the TSC Diesel failed. Several reports stated it failed due to a high coolant temperature alarm. Also, it was reported that a switch was found in 'Idle' mode versus 'Run' mode. Upon walking down the TSC Diesel Generator (post event) EP (Crozier & Lee) along with Pete Borchert discovered the TSC Diesel with a red alarm light indicating High Coolant Temperature. The local switch was set to the Run position. It is unknown if the switch was re-positioned or manipulated. Maintenance should trouble shoot and repair the TSC DG. They should review work associated with AMDGN HOT01 and its associated task #044950-LOP recovery for the TSC DG, PM 084314 – TSC DG Run instructions.

- 5) Several messages were sent via Arch pager system. While the pages seemed to have been sent out as desired, not all of the worn pagers work as anticipated. In some instances, two or more ERO may be standing next to each other in a facility, and one of the ERO will receive a page while another will not. This inconsistency causes frustration and confusion.

RECOMMENDATION: IS (Jamie Moore/Ray Webb) should evaluate ARCH coverage. Evaluate if additional Arch antennae can be added or strengthened at PV, if individual pagers vary in sensitivity, or some other options.

- 6) The procedure flow between the TSC EC and the STSC (EPIP 01 & EPIP-03) is not clear as it could be. This sometimes leads to confusion and may delay assumption of relief by the TSC for the STSC.

RECOMMENDATION: Emergency Planning should evaluate better procedure flow and providing clear direction such that it is readily apparent what actions are needed to have the TSC function in assuming onsite duties.

- 7) The failure of the TSC Diesel Generator adversely impacted several pieces of security equipment. This caused the fire department vehicle to become 'trapped' in the sally-port. Several ERO were 'stuck' in the security access area due to nitrate machines etc. having to be recalibrated and prepared for use after the loss of power. This delayed several ERO and adversely impacted the ability to staff on time. The VBS barrier was eventually manually 'pumped' up but this method was not timely and seemed difficult.

RECOMMENDATION: Security OPS should evaluate if the manual pump on the VBS barrier is working as designed i.e. check hydraulic oil, pump, other mechanisms. Security OPS/ESD Programs should evaluate a quick PA access alternative (per J. Levine/D. Mauldin) i.e. pat-down, verification of personnel as an option in the vent security emergency is down. It is not safe to hold up key ERO in a severe accident/emergency.

- 8) Unit Three reported that the W/Pager would not work due to the LOP.

RECOMMENDATION: Electrical Engineering/OSC should evaluate STSC power supplies and STSC PC servers during these type events and determine if WPAGE (LAN access) can be used during LOPs. If it (WPAGE) cannot be accessed done, consider other options.

- 9) The Emergency Operations Facility (EOF) lost power when the site experienced to LOOP.

RECOMMENDATION: Evaluate if the LOP in the EOF occurred as designed i.e. did the power fail to transfer or was the EOF a victim the site LOP.

- 10) The initial page for notifying ERO was delayed. This caused some ERO to be late in getting to their assigned facilities. The OPS Tech became very busy supporting other required activities that resulted in a delay in setting off the pagers.

RECOMMENDATION: OPS should evaluate the use and time management of the OPS Techs. OPS should ensure that regulatory required activities are given a priority over non-required activities.

- 11) This event is required to be reported for NRC Performance Indicators (PI's). Other required regulatory activities occurred during this event.

RECOMMENDATION: EP should evaluate if the classifications were appropriate and timely, facility staffing performance, if regulatory requirements were met, etc. during this event. PI's should be submitted in accordance with site procedures.

- 12) The JENC activated during the U2 Alert. Several conflicting actions were taken in conflict with the Offsite plan.

RECOMMENDATION: A policy should be reviewed and discussed at the senior and executive management levels.