

Munir, Mohammad

Outside of Scope

AR 01321301 Report

Aff Fac:	Byron	AR Type:	CR	Status:	APPROVED
Aff Unit:	02	Owed To:	A8861CAP	Due Date:	03/02/2012
Aff System:	AP			Event Date:	01/30/2012
CR Level/Class:	4/D			Disc Date:	01/30/2012
How Discovered:	H02			Orig Date:	02/01/2012
WR/PIMS AR:		Equip Tag:	-		

Action Request Details

Subject: U2 RX TRIP IR TO INCLUDE IN OPERATOR TRAINING

Description: Originator: (b)(6) Supv Contacted: (b)(6)

Condition Description:

This IR documents a summary of events from the U2 RX Trip (IR#1319908, 1320006) that occurred on 1/30/12 at 1001. This information needs to be incorporated into LORT, ILT and EO continuing training applicable to Byron and Braidwood.

Byron U2 automatically tripped on red first out - RCP BUS UNDERVOLT RX TRIP. After immediate actions were completed a crew brief was held to assess U2 status prior to transitioning to 2BEP ES 0.1. The crew recognized all equipment was tripped that was powered from 6.9 KV BUSES and 4.16 KV BUSES NON-ESF and ESF. All equipment that was running had trin

disagreement lights lit along with stop indication on the respective MCB control switch. The 2B AF pump was running providing flow to the steam generators. Equipment powered from emergency DC power was running (DC oil pumps for the main turbine and FW Pps).

The crew reviewed the electrical line-up status and discovered all 6.9 KV BUSES and 4.16 KV NON-ESF BUSES and ESF BUSES were powered by the U2 SATs. A successful ABT from the UATs to the SATs had occurred for BUSES 256, 257, 243 and 244.

Direction was given to restart equipment beginning with the standby 2B SX Pp. The NSO was unsuccessful in starting this pump. All 3 phases on BUS 241 and 242 were then checked to determine if there was a lockout on the SATs preventing loads from being started. There were no abnormal alarms lit associated with vital ESF power and all BUS alive lights were lit. BUS 241 and 242 Volt select switch in the A-B position indicated 4.16 KV. Volt select switch in the C-A and B-C position indicated 2.5 KV. An EO was dispatched to the U2 SATs and reported seeing smoke coming from the U2 SATs (U2 SATs later determined not to be faulted. See Engineering write-up below).

The abnormal voltage indication and local report from the EO led the crew to de-energize the U2 SATs. All SAT feed breakers were placed in PTL. This allowed both U2 DGs to auto start on UV and re-energize ESF BUSES. All safe shutdown loads properly sequenced on.

(b)(4)

(b)(4)

Below is a summary write-up from Engineering with additional information.

The C-Phase insulator stack for the U-2 SAT Revenue Metering Transformer (Combi-Unit) broke and part of the insulator stack fell to the ground. This caused the Phase-C connection to break from the Revenue Metering Transformer terminal, resulting in a Phase-C open circuit. An open circuit would not have caused any of the SAT protective relays, or differential relays to trip.

The protective relays are designed to trip during a fault/overcurrent condition. A fault condition did not occur therefore the SAT protective relays did not trip. The differential relays look at the differential between input current and output current on a per phase basis. In this case both input and output currents were zero therefore the SAT feed breakers did not open. The loads did not transfer from the SAT to the UAT because the SAT feed breakers did not open. The SATs continued to carry load on Phases A and B.

The RCPs fed by Buses 258 and 259, which were being fed by the SATs, sensed an undervoltage on Phases B-C. Undervoltage on 2 of 4 RCPs resulted in the Unit 2 trip. After the unit trip, Buses 256 and 257 autotransferred from the UATs to the SATs as designed. With Phase-C open, the current flow on Phases A and B went up, and caused all 4 RCPs to trip on Phase-A overcurrent.

The DGs did not autostart because an undervoltage on both Phases A-B and B-C are required, and the Phases A-B voltage was still normal. The Operators manually opened the SAT feed breakers to ESF Buses 241 and 242, which caused an undervoltage condition to occur on all three phases, and then both DG 2A and 2B autostarted, as expected. Subsequently, all of the low side and high side feed breakers for SATs 242-1 and 242-2 were opened. After ESF Buses 241 and 242 were reenergized from the DGs, Non-ESF Buses 243 and 244 were reenergized via crossies to ESF Buses 241 and 242, respectively.

At present, the Unit 2 DGs are supplying power to ESF 4.16 kV Buses 241 and 242 and to Non-ESF 4.16 kV Buses 243 and 244. All four Unit 2 6.9 kV buses are deenergized. Unit 2 is in a natural circulation cooldown using the 2A and 2B AF Pumps and the MS PORVs.

Immediate actions taken:

This IR will be referenced in a TRAC for Ops Training.

Recommended Actions:

Include this event in Ops training.

Operable Basis:

Reportable Basis:

Does not meet any reporting requirement.

Functionality Basis:

Reviewed by: (b)(6) 02/01/2012 23:37:49 CST

Reviewer Comments:

Shift review complete.

SOC Reviewed by: (b)(6) 02/02/2012 05:37:32 CST

SOC Comments:

Send to Operations Training for actions. (b)(6) 02/02/12

Assignments

Assign #:	<u>01</u>	Assigned To:		Status:	AWAIT/C
Aff Fac:	Byron	Prim Grp:	ACAPALL	Due Date:	02/06/2012
Assign Type:	TRKG	Sec Grp:		Orig Due Date:	
Priority:					
Schedule Ref:					
Unit Condition:					
Subject/Description:	U2 RX TRIP IR TO INCLUDE IN OPERATOR TRAINING ESF Power to U2.				