10 CFR PART 21 REPORT

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Power Reactor Event # 46997

Site: SUMMER			**Notification Date / Time:**	06/29/2011	09:49 (EDT)
Unit: 1	**Region:** 2	**State :** SC	**Event Date / Time:**	06/27/2011	16:11 (EDT)
Reactor Type: [1] W-3-LP			**Last Modification:**	06/30/2011	
Containment Type: DRY AMB					
NRC Notified by: BRUCE THOMPSON			**Notifications:**	MARK FRANKE	R2DO
HQ Ops Officer: STEVE SANDIN				PART 21 GP (email)	NRR
Emergency Class: NON EMERGENCY					
10 CFR Section:					
21.21	UNSPECIFIED PARAGRAPH				

Unit	Scram Code	RX Crit	Init Power	Initial RX Mode	Curr Power	Current RX Mode
1	N	Yes	100	Power Operation	100	Power Operation

APPENDIX R ANALYSES FAILS TO RECOGNIZE HOT-SHORT FAILURE RESULTING IN THE LOSS OF AN ESSENTIAL ELECTRICAL BUS

The following Part 21 report was received via fax:

"10 CFR 21: Appendix R analyses conducted for Virgil C. Summer Nuclear Station (VCSNS) failed to identify that a fire-induced hot-short failure in an ammeter circuit would result in a loss of the B-train 7.2KV essential electrical bus (XSW1DB).

"Appendix R analyses performed by Gilbert/Commonwealth (now Worley Parsons) in the early 1980s failed to recognize the possibility of a fire-induced hot-short condition in a circuit that was identified as being required for safe shutdown. This circuit connects a set of sensing current transformers (CTs) to an ammeter on the Main Control Board, and provides over-current sensing for an over-current relay. Gilbert/Commonwealth recognized that a fire-induced open circuit in this ammeter circuit would result in damage to, or a fire in, the B-train 7.2kV essential switchgear. Thyrite protectors were added to the circuit to protect the CTs from this open circuit condition as part of the Appendix R analysis.

"However, this analysis and resolution failed to consider the hot-short-to-ground failure mode. Current from a hot-short could flow through the ammeters, or neutral conductor, and then through the bus neutral over-current relay to ground. This could actuate the over-current relay, which in turn would actuate a lock-out relay and trip all incoming breakers to bus XSW1DB. This bus provides credited B-train power to safe-shutdown components credited for this scenario. The Appendix R analyses conducted for VCSNS by Gilbert/Commonwealth did not address the hot-short scenario and is considered to be a defect, or omission. reportable under 10 CFR 21.

"This condition was identified during the circuit analysis review for transitioning the Appendix R Fire Protection

IE 19

NRR

Power Reactor Event # 46997

Program to NFPA 805 and was reported to the NRC as an unanalyzed condition on 05/03/2011 (see Event Notification No. 46811). Corrective actions have been taken to address this issue."

The licensee informed the NRC Resident Inspector.

* * * UPDATE FROM JOE MARSDEN TO MARK ABRAMOVITZ ON 6/30/2011 AT 1643 * * *

"Worley Parsons Investigation Results:

"Although this design was not a generic or standard design, Worley Parsons performed further evaluation, including extent of condition, for other Nuclear Power Plants that Worley Parsons performed the original design and performed Appendix R Compliance Review/Modifications.
Five plants were identified as follows:

"1) Crystal River 3: Worley Parsons discussed the issue with Progress Energy and jointly concluded that Crystal River 3 is not impacted because their corresponding current transformer circuit design has a different configuration. The circuit design is not generic or programmatic.

"2) TMI Unit 1: TMI is not impacted because their corresponding current transformer circuit design has a different configuration. The circuit design is not generic or programmatic.

"3) Perry: The Appendix R Compliance Review was accomplished by a team of Worley Parsons and others. Since Worley Parsons was involved with the Appendix R analysis and the affected electrical drawings are not readily available at Worley Parsons, it was concluded that Worley Parsons could not complete the evaluation to determine if the Perry design condition could cause a substantial safety hazard. Worley Parsons issued letter PNPP-O-CO-011-WCLT-0001 to the Perry Design Engineering Manager, recommending Perry to complete the evaluation pursuant to 10CFR21.21(a).

"4) V.C. Summer: V.C. Summer is the subject plant and is impacted. VC. Summer is Issuing LER #2011-001-00, which constitutes the Part 21 Notification for this design defect, or omission.

"5) R.E. Ginna: Worley Parsons did not perform the Appendix R analysis for Ginna.

"Corrective Action:

"V.C. Summer has implemented immediate compensatory measures for this condition until a permanent solution is Identified. A root cause analysis was jointly performed with V.C. Summer. The root cause analysis and Worley Parsons corrective action program review considered this an isolated incident due to human error. No programmatic/procedure corrective actions were identified due to the historical nature of the issue.

"Actions to preclude recurrence: Human performance issues from this event will be communicated to the Worley Parsons Nuclear Engineering staff under our corrective action and lessons learned program."

Notified R1DO (Welling), R2DO (Franke), and R3DO (Lipa). Notified the Part 21 Group via e-mail.

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WorleyParsons

resources & energy

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DATE	June 30, 2011	**PROJ NO**	
TO	NRC Documents Control Desk	**FAX NO**	1-301-816-5151
COMPANY		**PAGES**	4 including cover page
FROM	Raffi Shahabian		
SUBJECT	10CFR21 NOTIFICATION OF DESIGN ERROR IN CURRENT TRANSFORMER CIRCUIT		

Attached is a letter to the NRC Document Control desk with one attachment.

If there are any questions, please call 610-855-2372.

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Date: 30 June 2011

Ref: Letter # PRE-N-169

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

SUBJECT: 10CFR21 NOTIFICATION OF DESIGN DEFECT IN CURRENT TRANSFORMER (CT) CIRCUIT

Description of the Defect:
An Appendix R modification for Virgil C. Summer Nuclear Station (VCSNS) performed in the mid 1980s, made to a CT circuit to bring it into compliance with Appendix R safe shutdown requirements, is not adequate. The modification does not address the spurious lock-out of an essential bus, XSW1DB, due to a postulated fire-induced hot short to the current transformer circuit.

Date of Identification
V.C. Summer identified to WorleyParsons on June 29, 2011, that they concluded this issue was considered a defect or omission, and they also notified the NRC via Event Notification No. 46997.

Background:
An Appendix R analysis performed by Gilbert/Commonwealth (now WorleyParsons) in the early 1980s failed to recognize the possibility of a fire-induced hot-short condition in a circuit that was identified as being required for safe shutdown. This circuit connects a set of sensing current transformers to ammeters on the Main Control Board, and also provides over-current sensing for an over-current relay. Gilbert/Commonwealth recognized that a fire-induced open circuit in this ammeter circuit would result in damage to, or a fire in, the B-train 7.2kV essential switchgear. Thyrite protectors were added to the circuit to protect equipment from this open circuit condition as part of the Appendix R analysis.

However, this analysis and resolution failed to consider the fire-induced hot-short failure mode. Current from a hot-short could flow through the ammeters, or neutral conductor, and then through the bus neutral over-current relay to ground. This could actuate the over-current relay, which in turn, would actuate a lock-out relay and trip all incoming breakers to bus XSW1DB. This bus provides power to B-train safe-shutdown components credited for this scenario.

This condition was identified during the V.C. Summer circuit analysis review for transitioning the Appendix R Fire Protection Program to NFPA 805. This was reported by V.C. Summer to the NRC as an unanalyzed condition on 05/03/2011 (see Event Notification No. 46811).
V.C. Summer concluded their 10CFR21 evaluation and reported on Event Notification No. 46997.

WorleyParsons conducted a 10CFR21 possible reportability evaluation, including extent of condition, under our procedure, and the results are provided below.

WorleyParsons Investigation Results:
Although this design was not a generic or standard design, WorleyParsons performed further evaluation, including extent of condition, for other Nuclear Power Plants that WorleyParsons performed the original design and performed Appendix R Compliance Review/Modifications. Five plants were identified as follows:

1) Crystal River 3: WorleyParsons discussed the issue with Progress Energy and jointly concluded that Crystal River 3 is not impacted because their corresponding current transformer circuit design has a different configuration. The circuit design is not generic or programmatic.
2) TMI Unit 1: TMI is not impacted because their corresponding current transformer circuit design has a different configuration. The circuit design is not generic or programmatic.
3) Perry: The Appendix R Compliance Review was accomplished by a team of WorleyParsons and others. Since WorleyParsons was involved with the Appendix R analysis and the affected electrical drawings are not readily available at WorleyParsons, it was concluded that WorleyParsons could not complete the evaluation to determine if the Perry design condition could cause a substantial safety hazard. WorleyParsons issued letter PNPP-0-C0-011-WCLT-0001 (attached) to the Perry Design Engineering Manager, recommending Perry to complete the evaluation pursuant to 10CFR21.21(a).
4) V.C. Summer: V.C. Summer is the subject plant and is impacted. V.C. Summer is issuing LER #2011-001-00, which constitutes the Part 21 Notification for this design defect, or omission.
5) R.E. Ginna: WorleyParsons did not perform the Appendix R analysis for Ginna.

Corrective Action:
V.C. Summer has implemented immediate compensatory measures for this condition until a permanent solution is identified. A root cause analysis was jointly performed with V.C. Summer. The root cause analysis and WorleyParsons corrective action program review considered this an isolated incident due to human error. No programmatic/procedure corrective actions were identified due to the historical nature of the issue.
Actions to preclude recurrence. Human performance issues from this event will be communicated to the WorleyParsons Nuclear Engineering staff under our corrective action and lessons learned program.

Person responsible for corrective action implementation, John Grove, Manager of Nuclear Engineering. Time to complete the action July 29, 2011.

WorleyParsons contact for additional information:

Raffi Shahabian, Director of Nuclear Projects, at 610-855-2372 or email, Raffi.Shahabian@worleyparsons.com

Respectfully,

Raffi Shahabian for

Mark S. Campagna
Vice President
General Manager, USAC Nuclear
WorleyParsons

Attachment: PNPP-0-C0-011-WCLT-0001

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June 27, 2011

PNPP-0-C0-011-WCLT-0001
File: PRE-169

Mr. Ted Hilston, Design Engineering Manager
Perry Nuclear Power Plant
10 Center Road (A-PY-A160)
Perry, Ohio 44081

Re: Perry Nuclear Station
10CFR21 Screening for Reportability
Appendix R Fire-Induced Fault

Dear Mr. Hilston:

In accordance with 10CFR21.21(b), we are informing you of our ongoing evaluation of a potentially reportable event for another nuclear plant, per paragraphs (a)(1) or (a)(2) and our Nuclear Possible Reportable Event procedure, as a design defect (error, omission, or other circumstance) in a safety related component for Appendix R compliance. Although Gilbert Associates Inc. (now WorleyParsons) had previous involvement with the design of Perry, our organization presently does not have the full knowledge of, nor access to, the Perry Nuclear Plant safety functions and Appendix R commitments to determine whether a similar design condition exists and if it could cause a substantial safety hazard. Therefore, we are informing you of the design conditions so that you may evaluate the applicability at the Perry Nuclear Plant pursuant to 10CFR21.21(a).

A summary description of the subject Appendix R compliance issue follows:

The specific Appendix R issue involves a CT circuit that originates from a B Train 7KV power bus XSW1DB that is credited for a Control Room/Cable Spreading Room fire. Bus XSW1DB feeds two B Train 480V Load Centers XSW1DB1 and XSW1DB2 that are also credited. The CT circuit routes to ammeters in the Main Control Room. This CT circuit also includes a XSW1DB bus neutral overcurrent relay. In the event of a Control Room fire, a fire-induced hot short to one of the CT circuit conductors is postulated. Current from the hot short could flow in the CT circuit and possibly energize the protective relay. This in-turn would energize a lockout relay that trips all incoming breakers to the credited B Train XSW1DB 7KV bus, such that credited B Train power would not be available.

If you have any questions or comments, please contact Mark Campagna, VP GM, at (610) 855-3076 or Allen Hartman, Chief Electrical/I&C Engineer, at (610) 855-2141.

Very truly yours,

Raffi Shahablan for

Mark S. Campagna
VP and General Manager, USAC Nuclear

Distribution:

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