

Power Reactor

Event # 46997

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

JE19  
NRR

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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.

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NRC FORM 361  
(12-2000)

U.S. NUCLEAR REGULATORY COMMISSION  
OPERATIONS CENTER

**REACTOR PLANT  
EVENT NOTIFICATION WORKSHEET**

EN # 46997

NRC OPERATION TELEPHONE NUMBER: PRIMARY -- 301-816-5100 or 800-532-3469\*, BACKUPS -- [1st] 301-951-0550 or 800-449-3694\*, [2nd] 301-415-0550 and [3rd] 301-415-0553 \*Licensees who maintain their own ETS are provided these telephone numbers.

NOTIFICATION TIME 0949	FACILITY OR ORGANIZATION V C Summer Nuclear Station	UNIT 1	NAME OF CALLER Bruce Thompson	CALL BACK # (803) 931-5042
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EVENT TIME & ZONE 1611	EVENT DATE 6/27/11	POWER/MODE BEFORE 100% Mode 1	POWER/MODE AFTER 100% Mode 1
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EVENT CLASSIFICATIONS		1-Hr. Non-Emergency 10 CFR 50.72(b)(1)	(v)(A) Safe S/D Capability	A/NA
GENERAL EMERGENCY	GEN/AECC	TS Deviation	ADEV	(v)(B) RHR Capability A/NB
SITE AREA EMERGENCY	SIT/AECC	<b>4-Hr. Non-Emergency 10 CFR 50.72(b)(2)</b>		(v)(C) Control of Rad Release A/NC
ALERT	AL/AECC	(i) TS Required S/D	ASHU	(v)(D) Accident Mitigation A/ND
UNUSUAL EVENT	UNU/AECC	(iv)(A) ECCS Discharge to RCS	ACCS	(xii) Offsite Medical A/MD
50.72 NON-EMERGENCY (see next columns)		(iv)(B) RPS Actuation (scram)	ARPS	(xiii) Loss Comm/Asmt/Resp A/CM
PHYSICAL SECURITY (73.71)	DDDD	(xi) Offsite Notification	APRE	<b>60-Day Optional 10 CFR 50.73(a)(1)</b>
MATERIAL/EXPOSURE	B???	<b>8-Hr. Non-Emergency 10 CFR 50.72(b)(3)</b>		Invalid Specified System Actuation A/NV
FITNESS FOR DUTY	HFT	(ii)(A) Degraded Condition	ADEG	<b>Other Unspecified Requirement (Identify)</b>
OTHER UNSPECIFIED RECMT. (see last column)		(ii)(B) Unanalyzed Condition	AUNA	✓
INFORMATION ONLY	NF	(iv)(A) Specified System Actuation	AESF	NONR

**DESCRIPTION**

Include: Systems affected, actuations and their initiating signals, causes, effect of event on plant, actions taken or planned, etc. (Continue on back)

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Appendix R analyses 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 (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.

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

NOTIFICATIONS	YES	NO	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD?	<input type="checkbox"/> YES (Explain above)	<input checked="" type="checkbox"/> NO
NRC RESIDENT	✓					
STATE(s)		✓		DID ALL SYSTEMS FUNCTION AS REQUIRED?	<input type="checkbox"/> YES	<input type="checkbox"/> NO (Explain above)
LOCAL		✓				
OTHER GOV AGENCIES		✓		MODE OF OPERATION UNTIL CORRECTED:	ESTIMATED RESTART DATE:	ADDITIONAL INFO ON BACK
MEDIA/PRESS RELEASE		✓				<input type="checkbox"/> YES <input type="checkbox"/> NO