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SUBJECT: Lengthens replacement period of circuit breakers in RPS electrical protection assemblies, from 3 yrs as previously committed to in LER 87-025-01 to 8 yrs, based on trouble-free experience to date w/replacement of circuit breakers.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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September 25, 1992
G02-92-226

Docket No. 50-397

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

Gentlemen:

Subject: WNP-2, OPERATING LICENSE NPF-21
EXTENSION OF EPA BREAKER REPLACEMENT PERIOD

- References:
- 1) LER 87-025-01; "Engineered Safety Feature Isolations and Actuations Caused By Reactor Protection System Equipment Failure," dated November 20, 1987
 - 2) LER 90-009-01; "Engineered Safety Feature (ESF) Isolations and Actuations Due to Loss of Reactor Protection System (RPS) Bus During Mode 5 (Refueling)," dated September 24, 1992
 - 3) GE SIL No. 496, Rev 1, "Electrical Protection Assembly Performance," dated September 14, 1990
 - 4) Letter, J. Armenta (GE) to R. Koenigs (SS), "GE PRC 91-06 GE ED&C F Frame Molded Case Circuit Breakers," G-KK-92-016, dated February 28, 1992

The purpose of this letter is to lengthen the replacement period of the circuit breakers in the Reactor Protection System (RPS) Electrical Protection Assemblies (EPA). The replacement period will be extended from three years as previously committed to in the Reference 1 Licensee Event Report (LER) to eight years. This is based upon trouble free experience to date with the replacement EPA circuit breakers when supplied with the design voltage to the undervoltage release (UVR) coil, Reference 2, and the qualified life of the breakers per Reference 3.

Reference 1 documents a loss of power to RPS Bus A in 1987 due to a spurious trip of an EPA circuit breaker (RPS-EPA-3A), hereinafter referred to as EPA breaker. The event caused a half-scam in RPS Division A and multiple Engineered Safety Feature (ESF) isolations and actuations.

Spurious trips of EPA breakers and failure to reclose after a trip had occurred in the past. However, none of the events had resulted in an ESF actuation.

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EXTENSION OF EPA BREAKER REPLACEMENT PERIOD

The cause of the spurious EPA breaker trips and failure to reclose is attributed to oxide formation on the coil plunger end of the UVR coil. This oxide formation reduced the magnetic force which holds the coil of the undervoltage relay in its set (activated) position to the extent that spurious trips occurred and/or the coil would not hold when reset.

The Supply System sent two EPA breakers and a logic card to the breaker manufacturer (General Electric) for analysis and root cause determination. The Supply System has received final reports from General Electric (GE). In addition, Plant Engineers discussed EPA breaker problems with other BWR utilities. An evaluation performed by the Plant Technical Staff on EPA breaker problems concluded from General Electric analyses that there appeared to be an aging problem in the undervoltage release accessory. This was based on the presence of oxide compounds found on the coil plunger end and the coil end stop areas. This is indicative of thermal aging caused by excessive voltage being supplied to the coil.

The failure mechanism was judged to be oxide buildup caused by overheating due to excessive design voltage on the coil. The coil voltage is controlled by the logic card for the associated EPA breaker.

The original condition of excess voltage applied to the coil of the undervoltage release device has been solved with the installation of new generation P.C. boards that limit voltage to 12VDC, Reference 2. The amperage load through the undervoltage release coil is within the qualified limits. This provides further assurance that thermal aging is minimized.

All six EPA breakers were replaced with 1987 model breakers (Cat. No. TFJ-224175) in 1987. The new breakers have a different type of undervoltage release coil. All of the breakers were again replaced with the new model breakers during the 1990 refueling outage. The Plant has not experienced any spurious actuations with the 1987 model breakers.

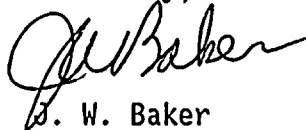
The Supply System was notified in March of 1992 by GE per Reference 4 that the 1987 model EPA breaker used at WNP-2 could fail to trip if the load current exceeded 50% of the trip unit rating (i.e., 87.5 amperes) for two hours or more. Upon receipt of this notification, the Supply System took immediate action to verify and record load amperage at RPS-MG-1 and 2 (Reactor Protection System Motor Generator) to be less than or equal to 85.0 amps indicated locally every two hours. During the 1992 Refueling outage, five of the six EPA breakers were replaced with newly designed 1992 model GE EPA breakers (Cat. No. TFJ-224175 WL). The RPS-EPA-3F breaker, one of two breakers in series on the alternate RPS power supply, was not replaced because a 1992 model breaker was not available. It will be replaced by the end of the 1993 Refueling outage. The RPS-EPA-3F breaker was tested per GE requirements (SAL 91-2F) at a maximum load current of 140 amperes (80% of the breakers' rated load current). This test verified the operability of the circuit breaker in RPS-EPA-3F for greater than normal (85 amperes) operating load currents and was a manufacturer validated alternative to breaker replacement. Therefore, this breaker does not require load amperage monitoring when RPS is on alternate power.

It is recommended that you contact your local law enforcement agency if you have information regarding a potential threat to life or property.

EXTENSION OF EPA BREAKER REPLACEMENT PERIOD

Based upon a qualified life from the manufacturer of 8 years per Reference 3 at a nominal amperage load less than or equal to 87.5 amps and a maximum ambient temperature of 104°F, the EPA breakers will be replaced at a maximum period of every eight (8) years. If abnormal breaker performance occurs within eight years of any given breaker operation, the replacement period will be reevaluated. Extension of the EPA breaker replacement period will be performed within the guidelines of 10 CFR 50.59.

Sincerely,



J. W. Baker

WNP-2 Plant Manager (Mail Drop 927M).

REF/bk

cc: JB Martin - NRC RV
NS Reynolds - Winston & Strawn
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DL Williams - BPA/399
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