



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

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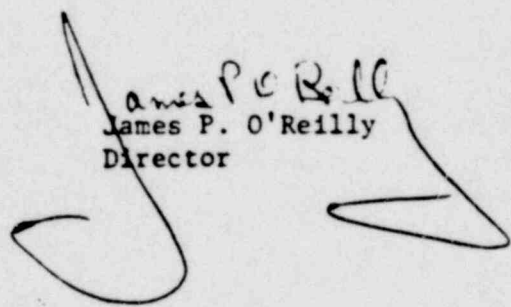
In Reply Refer To:
RII:JPO
50-413, 50-414
50-488, 50-489
50-490, 50-491
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Duke Power Company
Attn: Mr. L. C. Dail, Vice President
Design Engineering
P. O. Box 2178
Charlotte, North Carolina 28242

Gentlemen:

The enclosed Circular 79-02 is forwarded to you for information. If there are any questions related to your understanding of the suggested actions, please contact this office.

Sincerely,


James P. O'Reilly
Director

- Enclosures:
1. IE Circular 79-02
 2. List of IE Circulars
Issued in the last
12 months

cc w/encl:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

January 16, 1979

IE Circular No. 79-02

FAILURE OF 120 VOLT VITAL AC POWER SUPPLIES

Description of Circumstances:

On September 16, 1978, Arkansas Nuclear One - Unit 2, while in hot functional testing preceding initial criticality, suffered a degradation of both of the independent off-site power sources. This produced an undervoltage condition on the Engineering Safety Features (ESF) Buses and caused an inadvertent ESF actuation. The licensee determined that the ESF actuation occurred on a loss of at least two of the uninterruptable 120 volt vital AC power sources. Immediate investigation revealed that all four of the Solidstate Controls, Inc., (SCI) inverter static switches had automatically transferred to the alternate power supply (the 120 volt AC being supplied by transformers directly off the ESF buses rather than from the inverter output.) Figure 1 (attached) shows the functional interconnection of the 120 volt AC power supply system.

A single conclusive cause of the undesired SCI inverter static switch transfer could not be identified. However, the following problems were discovered during subsequent investigation.

- (a) The SCI inverters have circuitry to monitor the incoming DC voltage level which, on sensing a low voltage (nominally 104 DC volts for these inverters) will trip both input breakers to the inverter component after an adjustable time delay.

The setting of these time delay relays were not verified during either preoperational testing or subsequent maintenance. The time delay is necessary in order to accommodate transient loading conditions which may be encountered.

- (b) On one SCI inverter, a DC fuse within the inverter component was found blown. The vendor indicated that this fuse will blow due to an excessive DC voltage to the inverter component caused by a transient on the 480 AC input. The licensee has subsequently reset the taps on the 480V to 120V three-phase AC input transformer to limit the DC voltage to the inverter to less than the nameplate maximum rating in the event of a high AC input voltage transient.

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