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## Washington Public Power Supply System

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Docket No. 50-508

REGION V USE

U. S. Nuclear Regulatory Commission, Region V  
Office of Inspection and Enforcement  
1450 Maria Lane, Suite 260  
Walnut Creek, California 94596-5368

Attention: Mr. D. F. Kirsch, Acting Director  
Division of Reactor Safety and Projects

Subject: NUCLEAR PROJECT NO. 3  
POTENTIAL 10CFR50.55(e) DEFICIENCY  
WESTINGHOUSE DS/DSL CIRCUIT BREAKER  
DEFICIENCIES (D/N#54)

On October 12, 1984, the Supply System notified your office of a potential 10CFR50.55(e) deficiency concerning the subject condition. A subsequent Engineering/Licensing evaluation has determined that if the deficiencies remained uncorrected they could have affected adversely the safety of operations of the plant. Therefore, the subject condition is reportable in accordance with the provisions of 10CFR50.55(e).

Attached is the Supply System approved final report. The report provides a description of the deficiency, analysis of safety implications and corrective actions taken/planned. Should you have any questions or desire further information, please contact me directly.

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for A. D. Kohler (760)  
WNP-3 Program Director

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WASHINGTON NUCLEAR PROJECT NO. 3  
(DOCKET NO. 50-508)  
10CFR50.55(e) DEFICIENCY  
FINAL REPORT  
WESTINGHOUSE DS/DSL CIRCUIT BREAKER DEFICIENCIES (D/N#54)

DESCRIPTION OF THE DEFICIENCY

Ebasco was informed by Westinghouse Electric Corp. of a condition involving damage to wires on several type DS and DSL circuit breakers. The condition involves possible damage to the breaker internal control wiring when the breaker is moved on the extension rails into or out of its compartment. Such damage occurs when the wire bundle is pinched between the wire retainer and the steel gas shield mounted on the power center frame. Twenty-two (22) Class IE circuit breakers of this type were supplied by Westinghouse to WNP-3 by Contract 3240-48. Also, two (2) additional circuit breakers of this type were supplied by Westinghouse to Combustion Engineering for the Reactor Trip Switchgear under Contract 3240-02.

Subsequent to this notification, a field inspection of all Class IE circuit breakers of this type was performed at the WNP-3 site and confirmed that this condition only existed on the circuit breakers supplied by Contract 3240-48. Two (2) of the Class IE circuit breakers exhibited insulation scrapes on the breaker control wiring. The potential for wire damage also exists on some of the remaining breakers, as evidenced by the relatively small wire bundle clearance. The breakers in question supply power to motors which drive safety related equipment (pumps, fans, etc.) and also power Class IE 480 Volt Motor Control Center busses. The two (2) circuit breakers supplied by Contract 3240-02 did not exhibit any potential for wire damage due to a different housing design.

Possible failure modes from damaged wires would be: failure of electrically operated breaker to close on demand; failure to trip by shunt trip on demand; spurious electrical closing in connected position (if breaker has been levered in with closing spring charged); failure to trip on overcurrent (if equipped with Amptector device); arcing on a sensor lead (if equipped with Amptector device); false overcurrent tripping (if equipped with Amptector with residual ground fault trip); false tripping from undervoltage trip attachment (if equipped with this device); opening of auxiliary switch circuits; and shorting of auxiliary switch circuits.

The above failure modes would require a completely broken wire or wires, simultaneous grounds on specific wires, or direct short circuits between specific wires.

It should be noted that, to date, the damage that has occurred was not extensive enough to cause any of the above malfunctions. Damage could only occur while the breaker is being moved in or out of its compartment on its extension rails. This operation is done during periodic maintenance and inspection. Also, it is likely that any such damage would be detected by Maintenance personnel.

#### ANALYSIS OF THE SAFETY IMPLICATIONS

The safety hazard which could exist would be the failure of a Class IE 480 volt circuit breaker(s) to supply power to its load(s) when required. This could occur by:

- 1) Failure to operate upon demand, or
- 2) False tripping while in service.

As indicated above, the wiring damage sustained to date has not been extensive enough to cause any malfunction. If, however, this condition were to remain uncorrected, the repeated operation of drawing out the breaker could damage the wire to the point of failure which could in turn disable the control circuit(s) and thus result in a circuit breaker malfunction(s). This problem represents a potential common mode failure that could compromise the ability to achieve safe shutdown concurrent with an accident. Therefore, the subject deviation is considered significant and reportable per 10CFR50.55(e).

#### CORRECTION ACTION

The corrective action to be taken involves replacing the damaged wires on the two (2) circuit breakers and installing additional wire ties, where required, to ensure adequate wire bundle clearance on all breakers. A procedure detailing this has been submitted by Westinghouse (see Attachment II) and will be utilized.

A preliminary inspection of the Non-Class IE circuit breakers found that this condition did not exist. However, a more detailed inspection will be performed later. If the same problem is found, the breakers will undergo the same corrective action discussed above.

## WESTINGHOUSE ELECTRIC CORPORATION

## SWITCHEGEAR DIVISION

## NUCLEAR CLASS 1E DS AND DSL BREAKER WIRING FIELD INSPECTION

A condition involving damage to wires on several Type DS circuit breakers has been reported and confirmed. Type DS and DSL circuit breakers should be checked for possible wire damage on the left side particularly in the vicinity of the wire retainer which forms the extreme left boundary of the breaker facing the breaker front. Wires which protrude, to the left, beyond the wire retainer may be damaged or be subject to damage when the breaker is moved on the extension rails into or out of the breaker compartment if these wires are pinched between the wire retainer and the steel gas shield inside the breaker compartment. Wires which protrude or are likely to protrude, to the left, beyond the wire retainer should be treated as follows.

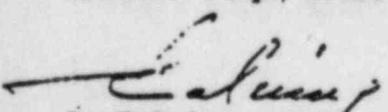
Wires which have been damaged, having skinned insulation, exposed copper conductor, or damage to the conductor itself, should be replaced. Wire of at least the same A.W.G. size should be used and insulation should be equivalent to or better than that of the damaged wire. Westinghouse currently uses ITT Surprenant Exane II 600 volt cross linked polyolefin insulated wire for Type DS/DSL circuit breaker wiring in nuclear IE applications.

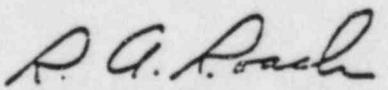
Replaced wires should be formed back into the wire retainer along with the undamaged wires. Wires entering the wire retainer at the rear of the breaker should be formed into a reasonable radius and tied with wire ties. Westinghouse currently uses ETC nylon, self-locking cable ties for Type DS/DSL circuit breakers.

Note: To permit easier access to the wires inside the wire retainer, the wire retainer may be removed. Wires can then be more readily formed and if deemed necessary, wire ties can be added to restrain the wires. When replacing the wire retainer, extreme care must be exercised not to pinch any wires between the breaker and the wire retainer.

Additional rigidity and mechanical support for wires and wire bundles may be provided by adding additional wire ties to the bundles and by tying them to the structure of the breaker.

Application of these procedures will prevent wires from straying, to the left, beyond the wire retainer and prevent potential wire damage in this area. However, diligent concern for wires and wiring must always be exercised when handling breakers and good practice dictates that circuit breaker wiring should be visually inspected during normal maintenance and before a breaker is re-inserted into a breaker compartment.

  
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