

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

July 18, 1997

NRC INFORMATION NOTICE 97-53: CIRCUIT BREAKERS LEFT RACKED OUT IN NON-SEISMICALLY QUALIFIED POSITIONS

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to the potential that some safety-related circuit breakers in their "racked-out" positions may not be seismically qualified. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

On June 13, 1991, during an in-house electrical distribution system functional inspection, Entergy Operations, Incorporated, the licensee for Arkansas Nuclear One, Unit 2, discovered that four circuit breakers in the 4160-volt engineered safety features switchgear had been routinely positioned in a racked-out configuration and seismic qualification for these circuit breakers in this position was never performed. This problem was reported to the NRC by the licensee for Arkansas Nuclear One, in accordance with Section 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors," of Title 10 of the Code of Federal Regulations (10 CFR 50.72), in Event Number (EN) 21189. On February 10, 1992, the licensee for Turkey Point, Units 3 and 4, reported in EN 22774 that its 4160-volt circuit breakers were not seismically qualified in the racked-out position. Recently, licensees have submitted a number of 50.72 reports on this issue: Susquehanna Steam Electric Company (EN 31279); Comanche Peak Steam Electric Station (EN 31322); Three Mile Island Nuclear Station (EN 31323); South Texas Project (EN 31362); Oyster Creek Power Plant (EN 31325); Millstone Nuclear Power Station, Units 1, 2, and 3 (EN 31335, EN 31336, and, EN 31339); LaSalle County Station (EN 31780); Braidwood Station (EN 31799); Joseph M. Farley Nuclear Plant (EN 31807 and EN 31967); Clinton Power Station (EN 31873); and Grand Gulf Nuclear Station (EN 32003).

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updated on 7/31/97

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Discussion

With breakers in any position other than the seismically qualified racked-in position, the Class 1E switchgear might not function as required for a design-basis earthquake. Therefore, the plant is in a condition outside of its design basis.

The root cause of these events was attributed to a lack of understanding of the interaction between the seismic qualification status of equipment and actual functional and/or operational configurations of equipment in the plant. When the switchgear was seismically qualified, it was not understood that the switchgear would be operated with the circuit breakers in the racked-out position. Also, the seismically qualified circuit breaker positions were not incorporated into plant operating procedures.

The term "racked-out" was defined to include any breaker position other than the fully connected operating position. There are several intermediate positions, depending upon the make and model of the switchgear, such as the "test" position in which the primary contacts are disengaged but the secondary contacts are in place so that the breaker can be tested. The "disconnect" position has both the primary and secondary contacts disengaged but the breaker is still in the switchgear cabinet and, in some cases, restrained. The "removed" position is similar to the "disconnect" position but the breaker is not restrained. These intermediate positions may not be seismically qualified.

Because there are so many different makes and models of switchgear, a single generic resolution of this concern is not likely. The licensees' corrective actions following these events included restoring the affected breakers to "racked-in" positions; evaluating the acceptability of various breaker configurations for maintaining seismic qualification, modifying the switchgear, and seismically qualifying the circuit breakers in all other positions, if needed; reviewing seismic qualification procedures used to procure new or replacement equipment to ensure that all anticipated modes of operation are considered; verifying that other similar equipment is qualified for all operating modes; developing training to enhance general awareness of the effect that plant operating conditions and equipment status have on the seismic qualification of the equipment; and physically removing those breakers from the affected switchgear rooms. It should be noted that removal of the circuit breaker from the switchgear will result in mass redistribution of the switchgear. Mass redistribution of the switchgear may then change the frequency of the switchgear and its dynamic response during a seismic event and may invalidate the original seismic qualification of the switchgear. Therefore, the situation must be evaluated to ensure that the removal of the circuit breaker will not invalidate the original seismic qualification of the switchgear.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Seymour H. Weiss for
Marylee M. Slosson, Acting Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical contact: Y. C. Li, NRR
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Attachment: List of Recently Issued NRC Information Notices

Attachment filed in Jacket.

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

| Information Notice No. | Subject | Date of Issuance | Issued to |
|------------------------|-----------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 97-52 | Inadvertent Loss of Capability for Emergency Core Cooling System Motors | 07/17/97 | All holders of OLs or CPs for nuclear power reactors |
| 91-50, Supp. 1 | Water Hammer Events Since 1991 | 07/17/97 | All holders of OLs or CPs for nuclear power reactors |
| 97-51 | Problems Experienced with Loading and Unloading Spent Nuclear Fuel Storage and Transportation Casks | 07/11/97 | All holders of OLs or CPs for nuclear power reactors Designers and fabricators of independent spent fuel storage installations All holders of or applicants for licenses to operate ISFSIs |
| 97-50 | Contaminated Lead Products | 07/10/97 | All U.S. Nuclear Regulatory Commission licensees |
| 97-49 | B&W Once-Through Steam Generator Tube Inspection Findings | 07/10/97 | All holders of OLs or CPs for nuclear power reactors |
| 97-48 | Inadequate or Inappropriate Interim Fire Protection Compensatory Measures | 07/09/97 | All holders of OLs or CPs for nuclear power reactors |
| 97-47 | Inadequate Puncture Tests for Type B Packages Under 10 CFR 71.73(c)(3) | 06/27/97 | All "users and fabricators" of type B transportation packages [as defined in 10 CFR 171.16(10)(B)] |

OL = Operating License
 CP = Construction Permit

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original signed by S.H. Weiss for
Marylee M. Slosson, Acting Director
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Office of Nuclear Reactor Regulation

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***SEE PREVIOUS CONCURRENCE**
Tech Editor has reviewed and concurred on 6/3/97

| OFC | CONTACTS: | D:DE | BC:PECB | (A)D:DRPM |
|------|-------------------|----------|-----------|-----------------------------------|
| NAME | TGreene* YCLI* | BSheron* | AChaffee* | MSlosson <i>SHW</i> <i>for</i> |
| DATE | 6/19/97 | 6/23/97 | 7/07/97 | 7/14/97 |

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| OFC | CONTACTS: | D:DE | BC:PECB | (A)D:DRPM |
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| NAME | TGreene* YCLI* | BSheron* | AChaffee* | MSlosson |
| DATE | 6/19/97 | 6/23/97 | 7/07/97 | 7/ 197 |

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July

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June XX, 1997
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This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

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| OFC | CONTACTS: | | D:DE | | BC-PEOB | | (A)D:DRPM |
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| NAME | TGreene* YCLi* <i>CP Greene for R.D.F. White 6/23/97</i> | | BSheron* | | <i>AGhafee</i> | | MSlosson |
| DATE | 6/19/97 | | 6/23/97 | | <i>7/1/97</i> | | 1 / 97 |

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*KD 6/25/97
make 7/1/97*

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In summary, the event was of concern because it could have resulted in operating conditions that are outside the plant's design basis.

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|------|-----------|--|--------------|-----------|---|
| OFC | PECB:DRPM | | EMEB:DE | E P D:DE | N |
| NAME | T. Greene | | Y. C. Li YLi | B. Sharon | |
| DATE | 6/1/97 | | 6/1/97 | 6/1/97 | |

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|------|-------------|--|------------|--|
| OFC | C/PECB:DRPM | | AD/DRPM | |
| NAME | A. Chaffee | | M. Slosson | |
| DATE | 1/197 | | 1/197 | |

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