



# 10 CFR Part 21 Notification

GE Nuclear Energy

SC00-02

December 18, 2000

To: **BWR and PWR Utilities (per Attachment 1)**

Subject: **Seismic Qualification of Electrically Operated GE Type AK-15/25 Circuit Breakers**

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|--|--|
| <input type="checkbox"/> Reportable Condition [21.21(d)]               | <input type="checkbox"/> 60 Day Interim Report [21.21(a)(2)] |
| <input checked="" type="checkbox"/> Transfer of Information [21.21(b)] | <input type="checkbox"/> Safety Information Communication    |

**Summary:**

This notification provides information concerning a discrepancy in the seismic qualification of electrically operated AK-15 and AK-25 low voltage power circuit breakers supplied by GE Nuclear Energy (GE-NE) since 1989.

GE Type AK-15/25 circuit breakers were originally qualified by GE-NE in 1989, based on seismic testing in which an RMS-9 overcurrent trip device was mounted to a manually operated AK-25 breaker. Subsequently, these test results were applied to the seismic qualification of both manually and electrically operated AK-15/25 circuit breakers. However, as a result of recent testing of an electrically operated AK-25 breaker, a revised seismic qualification level has been determined for electrically operated AK-15/25 circuit breakers. The seismic qualification of manually operated AK-15/25 circuit breakers remains unchanged.

Electrically operated GE Type AK-15/25 circuit breakers are used in safety related applications at several nuclear power plants. However, since the plant-specific applications/safety functions and mounting locations/seismic requirements are not known, it is not possible for GE-NE to evaluate the safety significance of this condition to determine if a defect exists in the context of 10CFR Part 21. We are therefore transferring the available information to the affected licensees for evaluation.

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Notice: This 10 CFR Part 21 Notification pertains only to the plants or facilities specifically indicated as being affected. GE Nuclear Energy (GE-NE) has not considered or endorsed the applicability. If any of the information in any plants or facilities other than those specifically indicated as being affected and for which GE-NE supplied the equipment or services addressed in the Notification. Determination of applicability of this information to a particular plant or facility, and the decision of whether or not to take action based on the Notification, are the responsibilities of the Owner of our plant or facility.

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**SC00-02**

**Background**

GE Type AK-15/25 low voltage power circuit breakers were originally manufactured by the GE Switchgear Department, and are currently supported by GE Industrial Systems, Plainville, CT.

GE-NE dedicates AK-15/25 circuit breakers, and supplies them to nuclear power plants as basic components for safety related applications. Electrically operated AK-15/25 circuit breakers are supplied under the following part numbers:

DD265A1305P005-P007, P013, P016, P018, P022-P023, P026-P029, P032, P037, P038

DD213A6963P001, P002, P005, P008, P009, P010

DD213A9686P002, P006-P008, P010, P012, P013

AK-15/25 circuit breakers were seismically qualified by GE-NE in 1989, based on testing in which an RMS-9 overcurrent trip device was mounted to a manually operated AK-25 breaker. These test results were subsequently applied to the seismic qualification of both manually and electrically operated AK-15/25 circuit breakers.

Recent seismic testing of a replacement 'Y'-relay for use on electrically operated circuit breakers revealed that electrically operated breakers utilizing relay schemes in the closing circuits may not actually be seismically qualified to the same levels as manually operated breakers. This concern was subsequently confirmed by additional testing of an electrically operated AK-25 circuit breaker, which defined revised seismic qualification levels for electrically operated AK-15/25 circuit breakers.

*Bingo*

The following table identifies electrically operated GE Type AK-15 and AK-25 low voltage power circuit breakers supplied to licensees since 1989 referencing seismic qualification based on the capability of manually operated breakers. In some cases, GE-NE provided Product Certification Reports containing the test response spectra (TRS) plots.

Plant	Customer P.O. No.	Item No.	GE Part No.	MPL
Beaver Valley	D079350	1	DD213A9686P002	UNS
Beaver Valley	D092277	1	DD213A9686P006	UNS
Beaver Valley	D092277	2	DD213A9686P007	UNS
Beaver Valley	D126764	1	DD265A1305P037	UNS
Browns Ferry	1011998	1	DD265A1305P038	UNS
Browns Ferry	21042-GE-00026Q	1	DD265A1305P018	UNS
Browns Ferry	21042-GE-00026Q	5	DD265A1305P022	UNS
Browns Ferry	21042-GE-00026Q	6	DD265A1305P023	UNS
Browns Ferry	21042-GE-00026Q	9	DD265A1305P026	UNS
Browns Ferry	21042-GE-00026Q	10	DD265A1305P027	UNS
Browns Ferry	21042-GE-00026Q	11	DD265A1305P028	UNS

**SC00-02**

Plant	Customer P.O. No.	Item No.	GE Part No.	MPL
Browns Ferry	21042-GE-00026Q	12	DD265A1305P029	UNS
Browns Ferry	RD-365689	1	DD265A1305P032	UNS
Calvert Cliffs	52898EX	1/1A/1B	DD213A9686P013	UNS
Crystal River	F844363D	1/1A	DD213A9686P012	UNS
Crystal River	F846524D	1	DD265A1305P016	UNS
Farley	QP2129	4	DD213A6963P008	UNS
Farley	QP2129	5	DD213A6963P009	UNS
Farley	QP2129	6	DD213A6963P010	UNS
Fort Calhoun	BP1746N	2	DD213A9686P010	UNS
Pilgrim	12302	1	DD213A6963P001	UNS
Pilgrim	12302	2	DD213A6963P002	UNS
Pilgrim	A-21145	1	DD213A6963P001	BOP
Pilgrim	M-06345	1A	DD213A6963P001	UNS
Pilgrim	M-58429	1	DD213A6963P001	UNS
Quad Cities	340552	1	DD213A9686P002	UNS

**Safety Basis**

The seismic qualification for both manually and electrically operated AK-15/25 circuit breakers was originally stated in GE-NE design documents as an IEEE 344-1975 zero period acceleration (ZPA) value of 2.08g. However, recent IEEE C37.98 testing has demonstrated that electrically operated AK-15/25 breakers are seismically qualified to:

- 1.4g ZPA (with the 125vdc nominal control voltage decreased to 90vdc and an undervoltage device (UVD) installed); or
- 2.4g ZPA (with 125vdc nominal control voltage and no UVD installed).

Using the correct ZPA value, the IEEE C37.98 standard response spectrum (SRS) curve can be constructed to determine if an electrically operated AK-15/25 circuit breaker meets seismic requirements at each mounting location.

Failure of a circuit breaker to close, remain closed, or close when not signaled would prevent it from performing its safety function in the circuit in which it is installed.

**Corrective/Preventive Actions**

As discussed previously, seismic testing was performed to determine seismic qualification levels for electrically operated AK-15 and AK-25 low voltage power circuit breakers supplied by GE-NE. A test report has been issued, and affected GE design documents have been revised to reflect the seismic qualification levels defined by the test report.

SC00-02

Attachment 1 - Affected Plants

	<u>Utility</u>	<u>Plant</u>
	AmerGen Energy Co.	Clinton
	AmerGen Energy Co.	Oyster Creek
	Carolina Power & Light Co.	Brunswick 1
	Carolina Power & Light Co.	Brunswick 2
	Commonwealth Edison Co.	CRIT Facility
	Commonwealth Edison Co.	Dresden 2
	Commonwealth Edison Co.	Dresden 3
	Commonwealth Edison Co.	LaSalle 1
	Commonwealth Edison Co.	LaSalle 2
x	Commonwealth Edison Co.	Quad Cities 1
x	Commonwealth Edison Co.	Quad Cities 2
	Detroit Edison Co.	Fennel 2
	Energy Northwest	Columbia
x	Energy Nuclear Generation Co.	Pilgrim
	Energy Nuclear Northeast	FitzPatrick
	Energy Operations, Inc.	Grand Gulf
	Energy Operations, Inc.	River Bend
	FirstEnergy Nuclear Operating Co.	Perry 1
	Nebraska Public Power District	Cooper
	Niagara Mohawk Power Corp.	Nine Mile Point 1
	Niagara Mohawk Power Corp.	Nine Mile Point 2
	Nuclear Management Co.	Duane Arnold
	Nuclear Management Co.	Monticello
	PECO Energy Co.	Limerick 1
	PECO Energy Co.	Limerick 2
	PECO Energy Co.	Peach Bottom 2
	PECO Energy Co.	Peach Bottom 3
	Pooled Equipment Inventory Co.	PIM
	PPL Inc.	Susquehanna 1
	PPL Inc.	Susquehanna 2
	Public Service Electric & Gas Co.	Hope Creek
	Southern Nuclear Operating Co.	Hatch 1
	Southern Nuclear Operating Co.	Hatch 2
x	Tennessee Valley Authority	Browns Ferry 1
x	Tennessee Valley Authority	Browns Ferry 2
x	Tennessee Valley Authority	Browns Ferry 3
	Vermont Yankee Nuclear Power Corp.	Vermont Yankee
x	Constellation Nuclear	Calvert Cliffs 1
x	Constellation Nuclear	Calvert Cliffs 2
x	FirstEnergy Nuclear Operating Co.	Beaver Valley 1
x	FirstEnergy Nuclear Operating Co.	Beaver Valley 2
x	Florida Power Corp.	Crystal River 3
x	Omaha Public Power District	Ft. Calhoun
x	Southern Nuclear Operating Co.	Farley 1
x	Southern Nuclear Operating Co.	Farley 2

**SC00-02****Attachment 2 - 10 CFR Part 21 Notifications for 1999-2000**

The following is a list of 10 CFR Part 21 Notifications that GE Nuclear Energy has provided to affected licensees in 1999 and 2000 as Reportable Conditions (RC), Transfers of Information (TI), 60 Day Interim Reports (60 Day) or Safety Information Communications (SC).

<u>Number</u>	<u>Ref.</u>	<u>Subject</u>	<u>Date</u>
SC99-01	PRC 99-01	Incorrectly Installed Jumper Wire in Rosemount Model 710 Trip Units (TV/SC - River Bend, SC - Hope Creek)	2/5/99
SC99-02	PRC 99-02	Errors in Specification and Outline Dimension Drawings for Rosemount Model 1153 Series B AlphaLine Nuclear Pressure Transmitters (SC)	3/11/99
SC99-03	PRC 99-03	Potential for Improper Application of Agasat E7000 Series Timing Relays (TI)	4/8/99
SC99-04	PRC 99-12	Incorrect Arc Chute for GE Type AMH-4.76-250-0D Circuit Breakers (TI - Cooper, Monticello)	7/6/99
SC99-05	PRC 99-26	Capacitor Failure in Rosemount Model 510DU and 710DU Trip Units (TI)	9/23/99
SC99-06	PRC 99-35	Soldering Deficiencies in Woodward EGM Controllers (SC)	10/7/99
SC99-07	PRC 99-28	Potential Failure of Foxboro N-2A0-L2C-R or 2A0-L2C-R Contact Output Isolator Cards (SC)	10/15/99
SC99-06 Supplement 1	PRC 99-35	Soldering Deficiencies in Woodward EGM Controllers (SC)	11/24/99
SC00-01	PRC 99-47	Minimum Test Voltage for GE Type AK/AKR Circuit Breakers (TV/SC)	2/15/00
SC00-02	PRC 00-41	Seismic Qualification of Electrically Operated GE Type AK-15/25 Circuit Breakers (TI)	12/18/00