



GPU Nuclear Corporation

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April 5, 1984

Mr. Richard DeYoung, Director
Office of Inspection & Enforcement
United States Nuclear Regulatory Commission
Washington, DC 20555

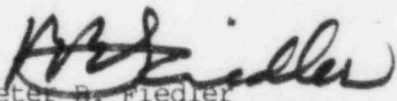
Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
IE Bulletin No. 83-08

Dear Mr. DeYoung:

The purpose of this letter is to respond to the directives set forth in IE Bulletin No. 83-08 which is concerned with the proper operation of the circuit breakers with Undervoltage Trip Attachments (UVTA's) being used in safety related applications other than as Reactor Trip Breakers (RTB's). Our response to the specified action items in the subject bulletin are in an attachment to this letter.


If you have any questions, please call me or the Oyster Creek Licensing Manager at (609)971-4643.

Very truly yours,


Peter B. Fiedler
Vice President and Director
Oyster Creek

DBC:vlc/0501V
Enclosure

Sworn to and Subscribed before
me this 5th day of April 1984.


A Notary Public of New Jersey

cc: Mr. J. Lombardo
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20014

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
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Attachment

Item No. 1

Identify applications of W type DB, W type DS, or GE type AK-2 circuit breakers with the UV trip feature as discussed in IEB 83-01 or 83-04 in safety related applications at your facility, other than as RTB's. CP holders and licensees should also identify similar applications of other types of breakers by other manufacturers that use a UV trip feature. If such circuit breakers are used or planned for use, identify the system(s) involved.

Item No. 1 Response

General Electric AK-2 circuit breakers with UV trip features used in safety related applications at Oyster Creek are listed below:

The circuit breaker trip function of items 13 through 22 is considered important to safety for shedding of the non-essential loads.

Item No .	Bus	Equipment	Breaker Type
1	1A2	Containment Spray Pump No. 1-1	AK-2A-50
2	1A2	Containment Spray Pump No. 1-2	AK-2A-50
3	1A2	Core Spray Booster Pump NZ03A	AK-2A-50
4	1A2	Core Spray Booster Pump NZ03D	AK-2A-50
5	1A2	CRD Feed Pump NC08A	AK-2A-50
6	1B2	Containment Spray Pump No. 1-3	AK-2A-50
7	1B2	Containment Spray Pump No. 1-4	AK-2A-50
8	1B2	CRD Feed Pump NC08B	AK-2A-50
9	1B2	Core Spray Booster Pump NZ03C	AK-2A-50
10	1B2	Core Spray Booster Pump NZ03B	AK-2A-50
11	1A3	Service Water Pump No. 1-1	AK-2A-25
12	1B3	Service Water Pump No. 1-2	AK-2A-25
13	1A2	Shutdown Pump NU02A	AK-2A-50
14	1A2	Rx. Bldg. Closed Cooling Water Pump 1-1	AK-2A-50
15	1A2	Building Exhaust Fan EF-1-5	AK-2A-50
16	1B2	Shutdown Pump NU02B	AK-2A-50
17	1B2	Shutdown Pump NU02C	AK-2A-50
18	1B2	Rx. Bldg. Closed Cooling Water Pump 1-2	AK-2A-50
19	1B2	Building Exhaust Fan EF-1-6	AK-2A-50
20	1B3	MCC 1B32	AK-2A-25
21	1A1	Feeder to USS 1A1	AK-2A-75
22	1B1	Feeder to USS 1B1	AK-2A-75

Item No. 2a

Review the design of the UVTA and the connecting linkage. Using input from the breaker manufacturer, determine the design margin available to open the breaker. Evaluate whether or not this design margin is adequate in view of safety applications, considering possible problems of alignment, lubrication, adjustment of spring tension, etc., discussed in the "Description of Circumstances".

Item No. 2a Response

The GE type AK-2 breakers' UVTA and associated linkage have been the subject of extensive reviews by utilities and the manufacturer because of their reactor trip function on B&W PWR plants. It is acknowledged that the design margin for the UVTA in performance of its circuit breaker trip function is small when considering the relatively slight trip torque available from the UVTA trip spring possibly working against hardened trip shaft bearing lubrication. At Oyster Creek, these breakers' trip function is considered safety related because they feed loads that are shed off busses picked up by the Emergency Diesel Generator during its loading sequence.

In reviewing the design of the breaker reset feature with the manufacturer, it appears that there is adequate design margin in the trip reset function for reliable breaker close operation when maintenance is performed following the manufacturer's recommendations.

Item No. 2b

Describe the current breaker surveillance program, including details of test frequency, methodology, and response time measurement of UVTA devices.

Item No. 2b Response

Current surveillance on 12 of the 22 circuit breakers with a UV trip feature is performed every refueling outage using surveillance procedure 636.2.001, "Diesel Generator Automatic Actuation Test". The test positively demonstrates the capability of the circuit breakers to trip on loss of power and to sequentially reclose to prevent overloading the Emergency Diesel Generators.

The Site Preventive Maintenance Program has existed at the plant since 1977. The program is based on General Electric Instruction Manuals GEI-50299 (AK-2A-25) and GEK-7303 (AK-2A-50 & 75) recommendations. Those recommendations from GE Service Advice 175 (CPPD) 9.3 that GE suggested as appropriate for Oyster Creek were included in the Program; specifically, Oyster Creek has been measuring the torque on the trip shafts and verifying the freedom of movement within the tripping and latching mechanisms of these breakers since 1982, while the checking of UV function and timing devices (by removing the control power fuse) was added in 1983. PM for UV function is performed, at the minimum, once every refueling outage cycle. The static time

delay undervoltage tripping device used at Oyster Creek consists of an undervoltage device (including the UV coil, paddle and other attachments) mounted on the breaker, a static time delay box mounted separately from the breaker and a control power transformer which is also mounted separately from the breaker. The UV coil circuit is continuously rated and will remain picked up as long as the voltage remains above the predetermined drop out voltage. Plant procedure has established a required time delay of 2 to 6 seconds between loss of power to the UV control unit (tested by pulling the control power fuse) and breaker trip. Mechanical response time measurements, that is the time from UV coil dropout to the time the breaker actually trips, have never been taken on these devices.

Item No. 2c

Review operating experience with the circuit breakers in your plant identified in Item 1. Provide a list of all malfunctions (both failure to trip and failure to close on demand) associated with the UVTA, including the connecting linkages and latching mechanisms. The list should include the date of each malfunction, and the operating time prior to failure or date of installation, and the date(s) of major maintenance. In general, when the circuit breaker UVTA is actuated on undervoltage and the breaker contacts do not open within the design time response, the NRC considers the breaker to have failed.

Item No. 2c Response

Based upon the review of available records dating back to 1972, a list of GE AK-2 circuit breakers with UVTA related failures was prepared below. Please note that all of these breakers were installed prior to December, 1969.

<u>Item</u>	<u>Equipment</u>	<u>Failure Date</u>	<u>Maint. Date Prior to Failure</u>	<u>Failure Mode</u>	<u>Apparent Cause</u>
1.	MCC 1B32	3/2/84	N/A	To Trip	Excessive friction on trip shaft resulting in high torque. RO # 84-002 being prepared.
2.	Serv. Water Pump 1-1	9/16/83	3/7/82	To Trip	Excessive friction on trip shaft due to a burr on the latch surface resulting in high torque RO #83-20 was issued.
3.	Serv. Water Pump 1-1	11/30/83	10/5/78	To Trip	Mechanical binding on the trip shaft. RO #78-31 was issued.
4.	Serv. Water Pump 1-2	11/30/78	N/A	To Trip	Mechanical binding on the trip shaft. RO #78-31 was issued.

<u>Item</u>	<u>Equipment</u>	<u>Failure Date</u>	<u>Maint. Date Prior to Failure</u>	<u>Failure Mode</u>	<u>Apparent Cause</u>
5.	RBCCW Pump No. 1-1	6/9/83	11/7/82	To Close & To Trip	Gag found tied around armature coil. Static time delay burned out. RO #83-15 was issued.
6.	Core Spray Booster Pump NZ03A	4/12/83	2/28/82	To Close	Wrong UV coil was installed, static time delay was burned. RO #83-08 was issued.
7.	Cont. Spray Pump No. 1-3 (51C)	11/26/78	6/10/77	To Close	Excessive friction on bearings of trip bar. RO #78-30 was issued.
8.	Cont. Spray Pump No. 1-4 (51D)	11/11/76	N/A	To Close	Excessive friction on bearings of trip bar, RO #76-27 was issued.
9.	Cont. Spray Pump No. 1-1 (51A)	3/6/75	N/A	To Close	Excessive friction on bearings of trip bar. RO #75-5 was issued.
10.	CRD Feed Pump NC08A	3/31/83	2/23/80	N/A	No UV test was performed. Deviation was noticed during PM when trip shaft was found to be binding. Breaker may have failed to trip. RO #83-04 was issued.
11.	Feeder to USS 1A1	8/18/83	N/A	To Close	Burned static time delay unit, fuse & UV coil.
12.	Exhaust Fan EF-1-6	3/7/84	2/28/80	To Trip	Circuit breaker failed to trip within time required in procedure. RO #84-002 being prepared.
13.	Shutdown Cooling Pump #NU02B	3/7/84	3/4/80	To Trip	Circuit breaker failed to trip within the time required in procedure. RO #84-002 being prepared.

Item No. 2d

Describe any preventive or corrective measures you have taken, or intend to take, based on the results of items 2a, 2b & 2c. Include any revisions to the Surveillance Test Program and methodology. Specifically, address the inherent reliability of the UV trip feature in view of its apparent heavy dependence on intensive maintenance and surveillance, and whether a basic design change is warranted to correct the problem, e.g., using a voltage sensitive relay to sense loss of voltage and energize the shunt trip coil from an independent DC source.

Item No. 2d Response

The surveillance procedure used to perform the Diesel Generator Automatic Actuation Test will be evaluated to determine if it should be revised to add other breakers to the 12 of 22 circuit breakers now covered by this procedure to verify tripping. As discussed previously in item no. 2b, these 22 circuit breakers have PM performed for UV function, at the minimum, once every refueling outage cycle.

The PM procedure will be revised to incorporate the remaining applicable recommendations listed in GE SA175 (CPPD) 9.3. These items will be in addition to the items in the service advice that have already been included in the present PM procedure as discussed in item No. 2b of this response.

To increase tripping reliability of the AK-2 circuit breakers, we are investigating the feasibility of modifying the control circuits for the twenty-two circuit breakers identified as performing a safety related function.

In addition, more frequent checks of the undervoltage trip mechanism will be made.