



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 1, 1996

MEMORANDUM TO: Stewart D. Ebner
Regional Administrator, Region II

William T. Russell, Director
Office of Nuclear Reactor Regulation

James Lieberman, Director
Office of Enforcement

FROM: *[Signature]*
Edward L. Jordan, Director
Office for Analysis and Evaluation
of Operational Data

SUBJECT: REPORTABILITY OF REACTOR TRIP BREAKER
PROBLEMS AT MCGUIRE AND CATAWBA

I have recently become sensitized to recent instances of reactor licensees failing to report non-emergency events, conditions, or defects and of numerous "retractions" of reports via "loopholes."

I discussed my concerns during the AEOD program review on July 22, 1996. Absent plant specific correction, an error becomes that licensee's practice. Generically, an NRC failure to revise guidance or requirements where different interpretations are reasonable leads to continued failure to report and hence, lost opportunities for corporate learning. I do not advocate getting tangled in esoterics of reporting, but I plan to illuminate each flagrant instance for appropriate action and followup.

On June 12, 1996, McGuire Unit 2 experienced a failure of the shunt trip function in a bypass RTB. The failure occurred during surveillance testing while the plant was shutdown. It was attributed to breakage/cracking of phenolic material in secondary contact disconnect assemblies. (Apparently a piece of the phenolic material fell into a specific contact and blocked its operation.)

Similar breakage/cracking of the phenolic material in secondary contact disconnect assemblies was then found in many other RTBs and/or RTB bypass breakers at McGuire and Catawba. One RTB at McGuire Unit 2 was on the verge of failure. (Apparently this breaker tripped on test because it was being held together by the breaker cubicle; however, the phenolic disconnect assembly essentially fell apart when the breaker was racked out for inspection, which was the last step of the test.) Additional details are provided in a draft Information Notice that Region II provided to NRR and AEOD on July 12, 1996 (see Attachment 1).

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On June 26, 1996, the licensee provided an ENS notification and submitted a special report concerning the initial failure at McGuire Unit 2. The ENS report was then retracted on July 1, 1996 (see Attachments 2 and 3). The retraction was made by the licensee on the grounds that the general Salem ATWS requirements had been removed from the McGuire Unit 2 technical specifications (TS) and no specific reporting requirement is contained in the license. However, we understand from discussions with the McGuire Licensing Project Manager that a related reporting requirement was included in the McGuire Unit 2 license as part of the TS change.

Isolated or random RTB failures are not specifically reportable¹ under 10 CFR 50.72 and 50.73. This example at McGuire is not isolated or random and it is important that RTB failures continue to be reported under license conditions or (TS) as highlighted by the McGuire event to assure that generic implications are identified as early as possible.

We understand that McGuire Unit 2 has a license condition requiring that the licensee preserve the evidence and report the failure of any RTB or RTB bypass inservice or in testing (on either the undervoltage coil or the shunt coil). This is what would be expected as a result of followup actions taken in response to the Salem ATWS event in 1983. However, McGuire Unit 1 does not have a similar license condition, which raises a question as to other plants. To ensure that RTB failures are reported in the future, I recommend that it be confirmed that license conditions continue to require reporting of RTB failures, particularly when and if the TS are modified to remove such requirements from the TS. An alternative is to invoke reporting criteria of Part 21 regarding a defect in a basic component that could create a substantial safety hazard. Another alternative is for AEOD to revise 50.72, 50.73, and NUREG-1022 to clearly include single RTB breaker failures or to assure that such failures are captured in the reliability data rule. Please advise by August 30, 1996 of your plans or recommendations (specific to McGuire and generic).

If you or your staff have any questions on this subject, please contact me at 415-7472 or Dennis Allison of my staff at 415-6835.

Attachments: As stated

cc: J. Taylor, EDO
J. Milhoan, EDO
H. Miller, RI

A. Beach, RIII
L. Callan, RIV

¹ It can be argued that the initial failure at McGuire Unit 2, which is associated with broken and cracked phenolic disconnect assemblies in many other breakers, one of which was on the verge of failure, is reportable under 10 CFR 50.72(b)(2)(iii) and 50.73(a)(2)(v), "Event or Condition that Alone Could Prevent...." A similar example, copied from previous guidance, is Example 8, page 72, NUREG-1022, Rev. 1, Second draft. That example involves a pump bearing seizure due to improper lubrication. The redundant pump was also lubricated improperly (i.e., in the same condition). To apply this reporting criterion, there should generally be a reasonable expectation of preventing fulfillment of the safety function.

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

July ??, 1996

NRC INFORMATION NOTICE 96-?: POTENTIAL FAILURE OF REACTOR TRIP BREAKER
SECONDARY CONTACT DISCONNECT ASSEMBLY DUE TO
CRACKING OF PHENOLIC MATERIAL

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 possible failure of reactor trip breakers to properly function due to cracking or breakage of the secondary contact disconnect assemblies. The disconnect assemblies are made from a phenolic material and provide circuit connections between the control and monitoring devices on the breaker and external control circuits. Breakage or partial cracking of these assemblies may prevent the breaker from performing its design function or other secondary functions provided by the breaker position status. It is expected that recipients will review this 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 12, 1996, during reactor trip breaker (RTB) testing at McGuire Unit 2, a Westinghouse Pressurized Water Reactor (PWR), the licensee (Duke Power Company) identified that one of the bypass RTBs failed to open electrically when the local shunt trip push button was depressed. The breaker was later verified to open mechanically. The McGuire Unit 1 and Unit 2 RTBs and bypass RTBs are Westinghouse model DS-416 equipped with four secondary contact disconnect assemblies, each containing eight spring loaded contacts, mounted on the upper rear portion of the breaker. The shunt trip, undervoltage trip and open/closed monitoring circuits for the breakers are wired through these assemblies. During subsequent inspection of the RTB, a small piece of the assembly was found. The licensee postulated that the fragment may have lodged in the secondary contact disconnect assembly, preventing good electrical connection for the local shunt trip pushbutton circuit. The assemblies are made of a molded, cellulose-filled, phenolic material that appears to have low impact strength and may be highly susceptible to chipping or cracking. McGuire Unit 2 was in cold shutdown (MODE 5) at the time of discovery. The postulated root cause of the chipped assembly was determined to be mechanical damage during maintenance or initial installation.

On July 1, 1996, while performing extent of condition inspections of the remaining Unit 1 and Unit 2 RTBs, the licensee discovered that an entire

secondary contact disconnect assembly on a Unit 1 RTB was broken in half and one of the spring loaded finger contacts had fallen out in the breaker cubicle during the breaker inspection. Unit 1 was operating at 100% at the time of discovery.

The licensee inspected the internals of the breaker cubical for damage. No damage to the cubicle was identified. The licensee replaced the failed breaker with an available bypass RTB. Required retesting of the replacement breaker was completed and the RTB was placed in service. The postulated root cause of the cracked assembly was determined to be stress induced from over-torquing of the block to breaker mounting bolts during replacement of the assembly in September 1994.

Based on the situation identified at McGuire, the licensee performed additional inspections of RTB assemblies at Catawba. Evidence of RTB secondary contact disconnect assembly cracking was also discovered.

Discussion

In 1993, Westinghouse issued a revised technical manual for a variety of breakers including the DS-416 model. The revised manual specified a torque value for the secondary contact disconnect assemblies to breaker mounting bolts. Licensee's should review the maintenance history of applicable breakers to determine if inappropriate torque values have been used during replacement or initial installation of the subject secondary contact disconnect assemblies. In addition, inspection of the disconnect assemblies may be warranted to determine if any other cracking problem exists.

Information Notice (IN 95-19), Failure of Reactor Trip Breaker to Open Because of Cutoff Switch Material Lodged in the Trip Latch Mechanism, was issued on March 22, 1995, to alert licensee's of a related problem involving breakage of phenolic material in RTB subcomponents.

The majority of the reactor trip breaker failures at power reactors have been caused by problems with relatively small electrical subcomponents in the breaker assembly, rather than the malfunction of the main breaker mechanism itself. The failures identified at McGuire and Catawba involving cracking of breaker phenolic material may represent a generic concern of the subcomponent structural integrity of reactor trip and other important breakers. Proper care of these components during routine and corrective maintenance could prevent similar problems at other facilities.

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

Brian K. Grimes, Director
Division of Project Support
Office of Nuclear Reactor Regulation

Technical contacts: S. Shaeffer, Region II
(704) 875-1681

M. Sykes, Region II
(704) 875-1681

ATTN

THIS EVENT HAS BEEN RETRACTED. THIS EVENT HAS BEEN RETRACTED

| | |
|---------------|---------------------|
| POWER REACTOR | EVENT NUMBER: 30680 |
|---------------|---------------------|

| | |
|--|--|
| FACILITY: MCGUIRE REGION: 2 STATE: NC RX TYPE: W-4-LP, W-4-LP | NOTIFICATION DATE: 06/28/96 NOTIFICATION TIME: 14:42 EST EVENT DATE: 06/12/96 EVENT TIME: 00:00 EST LAST UPDATE DATE: 07/01/96 |
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| | |
|--|-----------------------------------|
| NOTIFIED BY: JAMES SNYDER N. NRC OFFICER: DOUG WEAVER | NOTIFICATIONS KERRY LANDIS RDC |
| EMERGENCY CLASS: NOT APPLICABLE NRC SECTION: NRC LICENSEE 24 HR REPORT | |

| UNIT | STREAM CODE | RX TRIP | INIT PWR | INIT RX MODE | CURR PWR | CURR RX MODE |
|------|-------------|---------|----------|---------------|----------|---------------|
| 1 | N | N | 0 | COLD SHUTDOWN | 0 | COLD SHUTDOWN |

EVENT TEXT

FAILURE OF A REACTOR TRIP BYPASS BREAKER DURING A SURVEILLANCE TEST

DURING A SURVEILLANCE OF THE UNIT 2 REACTOR TRIP BYPASS BREAKER "2A", THE BYPASS BREAKER DID NOT TRIP AS REQUIRED WHILE IN THE TEST POSITION. THE REACTOR TRIP SYSTEM REMAINED FULLY FUNCTIONAL; HOWEVER, SURVEILLANCE TESTING COULD NOT BE PERFORMED DUE TO THE FAILURE OF THE BYPASS BREAKER TRIP. SITE NRC PERSONNEL WERE NOTIFIED ON 06/13/96. THIS NOTIFICATION SPECIAL REPORT IS MADE PER THE REPORTING REQUIREMENTS OF MCGUIRE UNIT 2 FACILITY OPERATING LICENSE NPF-17, AMENDMENT 2, DATED 05/27/83. ONSITE FAILURE INVESTIGATION IS PROCEEDING.

THE LICENSEE INFORMED THE NRC RESIDENT INSPECTOR.

* * * 1124 JULY 1, 1996, UPDATE FROM CRANE RECEIVED BY TROCINE * * *

THE LICENSEE IS RETRACTING THIS EVENT BECAUSE THE LICENSE CONDITION TO REPORT ANY FAILURES ASSOCIATED WITH REACTOR TRIP BYPASS BREAKERS IS NO LONGER PART OF THE LICENSEE'S LICENSE OR TECHNICAL SPECIFICATIONS.

THE LICENSEE NOTIFIED THE NRC RESIDENT INSPECTOR AND PLANS TO SUBMIT A RETRACTION OF A WRITTEN FOLLOWUP NOTIFICATION (AN ABSTRACT OF A SPECIAL REPORT) THAT WAS SUBMITTED TO THE REGIONAL OFFICE. THE NRC OPERATIONS CENTER NOTIFIED THE R2DC LANDIS.



DUKE POWER

DATE: June 26, 1996


U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: McGuire Nuclear Station Unit 2
Special Report 96-03
Problem Investigation Process No.: 2-M96-1690

Gentlemen:

Pursuant to McGuire Nuclear Station License Condition 2.C(12) attached is Special Report 96-03 concerning Failure Of Reactor Trip Bypass Breaker 2A Due To An Unknown, Possible Material Deficiency. This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,


T.C. McMeekin

JWP/bcb

Attachment

cc: Mr. S.D. Ebnetter
Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta St., NW, Suite 2900
Atlanta, GA 30323

Mr. Victor Nerses
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, GA 30339

Mr. George Maxwell
NRC Resident Inspector
McGuire Nuclear Station

030015

9607030084 960626
PDR ADOCK 05000370
S PDR

bxc: B. L. Walsh (EC11C)
Z. L. Taylor (CNS)
G. A. Copp (EC050)
J. I. Glenn (MG02ME)
P. R. Herran (MG01VP)
C. B. Davis (MG01CP)
J. E. Burchfield (ONS Reg Compliance)
G. H. Savage (EC06E)
G. B. Swindlehurst (EC11-0842)
C. M. Misenheimer (EC08I)
R. F. Cole (EC05N)
J. M. Frye (EC05N)
T. G. Becker (PB02L)
P. M. Abraham (EC08I)
R. B. White (MG01VP)
L. V. Wilkie (ON03SR)
D. P. Kimball (CN05SR)
K. L. Crane (MG01RC)
R. N. Casler (EC05N)
NSRB Support Staff (EC05N)

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104) OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

McGuire Nuclear Station, Unit 2

DOCKET NUMBER (2)

05000370

PAGE (3)

1 OF 1

TITLE (4)

Failure Of Reactor Trip Bypass Breaker 2A Due To An Unknown, Possible Material Deficiency

| EVENT DATE (5) | | | LER NUMBER (6) | | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | |
|---------------------|-----|------|---|-------------------|-----------------|-----------------|-----|------|-------------------------------|------------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER(S) |
| 06 | 12 | 96 | N/A | N/A | N/A | 06 | 26 | 96 | N/A | 05000 |
| OPERATING MODE (9) | | | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more of the following) (11) | | | | | | | |
| 5 | | | <div style="display: flex; justify-content: space-between;"> <div> 20 402(b) 20 405(a)(1)(i) 20 405(a)(1)(ii) 20 405(a)(1)(iii) 20 405(a)(1)(iv) 20 405(a)(1)(v) </div> <div> 20 405(c) 50 36(c)(1) 50 36(c)(2) 50 73(a)(2)(i) 50 73(a)(2)(ii) 50 73(a)(2)(iii) </div> <div> 50 73(a)(2)(iv) 50 73(a)(2)(v) 50 73(a)(2)(vi) 50 73(a)(2)(vii)(A) 50 73(a)(2)(vii)(B) 50 73(a)(2)(x) </div> <div> 73 71(b) 73 71(c) X OTHER (Specify in Abstract below and in Text, NRC Form 366A) </div> </div> | | | | | | | |
| POWER LEVEL (10) 0% | | | | | | | | | | |

LICENSEE CONTACT FOR THIS LER (12)

NAME

J. W. Pitesa

TELEPHONE NUMBER

AREA CODE

(704)

875-4788

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPD | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPD |
|-------|--------|-----------|--------------|-------------------|-------|--------|-----------|--------------|-------------------|
| X | RBK | CKTBRK | W120 | YES | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

X YES (If yes, complete EXPECTED SUBMISSION DATE)

NO

EXPECTED SUBMISSION DATE (15)

| MONTH | DAY | YEAR |
|-------|-----|------|
| 07 | 26 | 96 |

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

Unit Status: Unit 2 was in Mode 5, Cold Shutdown, at 0 percent Reactor power. **Special Report 96-03** is being submitted in accordance with McGuire Nuclear Station, Unit 2, License Condition 2.C(12).

Event Description: During the Unit 2 Train A SSPS Monthly Test on June 12, 1996, it was discovered that Unit 2 Bypass Reactor Trip Breaker BYA would not open electrically in the test position. The breaker failed to open on several attempts.

Event Cause: A cause of Unknown, Possible Material Deficiency has been assigned. Investigation revealed that a piece of the block for the Breaker Secondary Contact Assembly was chipped off. It was also noted that contact 4 (unrelated to the Shunt Trip Circuitry in question) was deformed/bent in such a manner that the position of the contact was higher than the other contacts in the assembly.

Corrective Action: The chipped block was replaced with a new block assembly from the warehouse. In addition, the shunt trip coil was replaced as a conservative measure. The breaker was re-tested and placed back in service. Inspections were performed on 6 of the 7 remaining reactor trip breakers on both units, looking for chipped blocks as well as deformed bent contacts. The remaining breaker is scheduled to be inspected in early July, 1996. A thorough cause investigation will be completed by July 26, 1996.