# CATEGORY 2

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9706250084 DOC.DATE: 97/06/13 NOTARIZED: NO DOCKET #

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| | 50-287 Oconee Nuclear Station, Unit 3, Duke Power Co. | 05000287 |
| | 50-369 William B. McGuire Nuclear Station, Unit 1, Duke Powe | 05000369 |

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TUCKMAN,M.S. Duke Power Co.

RECIP.NAME RECIPIENT AFFILIATION

Docketing & Services Branch

SUBJECT: Comment opposing re "Proposed Generic Communication Control Rod Insertion Problems" NRC 970520.

DISTRIBUTION CODE: DS09D COPIES RECEIVED:LTR 1 ENCL 0 SIZE: 6

TITLE: SECY/DSB Dist: Public Comment on Proposed Rule (PR)-Misc Notice;Reg G

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M. Chatterton
J. Shapaker
W. Burton

62 FR 26729
May 20, 1997

(10)

Duke Power Company
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DUKE POWER

June 13, 1997

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop T-6D-69
Washington, DC 20555-0001



Subject: Duke Power Company
McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
Catawba Nuclear Station
Docket Nos. 50-413 and 50-414
Oconee Nuclear Station
Docket Nos. 50-269, 50-270, 50-287
*Comments on Proposed Generic Communication, Control Rod Insertion Problems, NRC, May 20, 1997*

Reference: "Proposed Generic Communication; Control Rod Insertion Problems", Nuclear Regulatory Commission, May 20, 1997.

The above reference requests comments on a proposed NRC Bulletin supplement concerning the potential for incomplete rod insertion and requested actions for ensuring continued operability of control rods.

Duke Power recognizes the importance to nuclear safety of having control rods insert fully and promptly when needed. It is one of two independent means of terminating the fission process as required by General Design Criteria (GDC) 26, of Appendix A to 10CFR Part 50, with the other being the ability to add soluble boron. Duke Power has established startup testing programs per 10CFR part 50 Appendix B Criteria XI to verify that at Beginning of Cycle (BOC) the control rods drop within the required Technical Specification times. This testing has been performed since cycle 1 on all seven of our reactors.

When operating experience from Wolf Creek and South Texas Plants, as well as some problems noted in foreign PWRs with incomplete control rod insertion became available, the Westinghouse, Combustion Engineering, and Framatome Cogema Fuels (FCF) Owners Groups began to analyze the root cause for the problem and eventually determined the cause to be

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fuel assembly related. Utilities worked with the Owners Group to provide additional operating experience and perform additional testing on the control rods and fuel assemblies to gain insight into the cause of the problem. Issuance of Bulletin 96-01 resulted in all owners of Westinghouse PWRs performing End of Cycle (EOC) drop and drag testing to further define the scope of the insertion problem. Duke Power has a history of being proactive and performing tests and lead test assembly programs to identify and resolve issues that are significant. An example of this is the rod drop testing being performed on Oconee 1 and 2 to proactively identify control rods that drop in 1.4 sec or more (compared to a Technical Specification limit of 1.66 sec) due to corrosion in the ball check valves and crud on the lead screw and bushing region of the thermal barrier. When these rods are identified, the thermal barrier is replaced with a design that has been proven to eliminate this problem.

Duke Power offers the following comments on the proposed bulletin.

**Framatome Cogema Fuel Has Been Shown Not to be Susceptible**

Duke Power uses twelve foot fuel manufactured by Framatome Cogema Fuels (FCF) in Oconee, McGuire and Catawba. Oconee uses 15x15 Mark B fuel and McGuire and Catawba use 17x17 Mark BW fuel that through design features, drop and drag test data, and Post Irradiation Examination (PIE) data has been shown not to be susceptible to incomplete rod insertion problems to a fuel assembly average burnup of 53,180 MWD/MTU. This information was presented to the NRC on December 18, 1996 and formally submitted by FCF to the NRC on January 31, 1997.

For the MKBW fuel used in McGuire and Catawba, key design differences between the MKBW and V5H fuel designs are: shorter fuel assembly length, increased upper guide tube inner and outer diameter, lower fuel assembly holddown spring forces, fuel rods seated on the bottom nozzle, an intermediate grid design that is allowed to move and is not rigidly attached to the guide tubes, a taller intermediate grid design, a top grid design that transmits loads directly to the top nozzle, and grids which are keyed during fuel rod loading. All of these features result in less compressive loading on the guide tubes.

For Oconee, the key differences between the MKB fuel and the Westinghouse V5H fuel include: larger diameter guide thimble

with significantly more clearance for the control rods, fuel rods seated on the bottom nozzles, floating intermediate grid design, top and bottom grids that transmit loads directly to the nozzles and not to the guide tubes, grids which are keyed during fuel rod loading, and a uniform diameter guide thimble from top to bottom without a dashpot.

Due to these design features and successful in-reactor testing to burnup levels approaching the licensed limit of the fuel, Duke Power feels that the ability of the control rods to insert has been soundly demonstrated and additional testing as proposed in this supplement is not needed.

**Economic and Technical Impact of Proposed Supplement**

The actions requested in the supplement are excessive and would result in significant economic cost to the utilities and the additional information gathered is not likely to be different than what was collected for the original response to Bulletin 96-01. Current McGuire and Catawba fuel cycles do not have fuel assemblies which exceed burnup levels already tested.

One action a utility could take as described in the proposed supplement would be to design fuel cycles which limit control rods to assemblies with less than 35,000 MWD/MTU of burnup. However, this cannot be implemented at Duke Power without a change in burnable absorber design. Oconee, McGuire, and Catawba currently utilize discrete burnable absorber rods which occupy the guide thimbles of most fresh fuel assemblies. Without changing burnable absorber design, control rods cannot be placed in fresh fuel. Also, burnup typically exceeds 35,000 MWD/MTU during the second cycle of burnup. Therefore, both once-burned and twice-burned fuel cannot be placed under control rods due to exceeding the burnup limits. Therefore, this action cannot be taken without a change in the burnable poison design, which would necessitate new analyses, and NRC review.

The proposed supplement requests licensees to verify full insertability and perform control rod drop tests when the fuel assembly burnup limits are exceeded. The minimum estimated cost for this testing program is $4.2 million per unit per cycle for McGuire and Catawba and $3.15 million for Oconee. The estimate is based on a shutdown every two months once these limits are exceeded (i.e., seven shutdowns per cycle per unit) and a minimum of two days lost generation for each test. No costs have been included for BOC/EOC control rod drop testing. In summary, complying with this

testing will result in a minimum cost of $17.5 million per year for Duke Power Company.

An alternative requested action of the proposed supplement is to demonstrate insertability through testing every 2500 MWD/MTU or through rigorous engineering analysis. This action should be modified to include demonstrating insertability through either analysis, testing, or a combination. It is unclear as it is written what an acceptable "rigorous analysis" is. It is also unclear as to whether it has to be submitted and approved by the NRC and whether the utility must perform rod drop testing while it is under review.

The requirement for testing should be limited to be beyond the current burnup where data has been obtained (based either on utility's own data or from a similar plant using similar fuel). Furthermore, if the licensee has identical units using similar fuel that testing only one unit at EOC should be sufficient. Bulletin 96-01 required testing when a unit was down for a reasonable period of time but did not require the licensee to shut the unit down solely for control rod testing. This approach is much more preferable than the one outlined in the proposed supplement, which would impact cycle capacity factor by about 3%.

**Increased Risk**

Challenges to safety systems typically occur more often during plant evolutions than at hot full power. For instance, McGuire and Catawba shutdowns and startups require swapping feedwater flow from the main feedwater system to the auxiliary feedwater system and back. This evolution is complicated and can create a safety risk.

The industry has already experienced one event while preparing to perform rod drop testing. This event is described a March 21, 1997 letter from INPO to utility CEOs expressing concern about recent control rod mispositioning events. Requiring additional shutdowns, startups, and RCCA manipulation will increase the potential for events which could result in higher safety concerns than the original issue.

**Summary**

In summary, extensive data were collected during 1996 as a result of NRC Bulletin 96-01. The proposed supplement as written is excessive in requiring plant shutdowns to obtain

control rod drop data and would result in a significant economic penalty to Duke Power. Both the measured data and design features support the conclusion that FCF fuel is not susceptible to incomplete rod insertion up to the currently licensed fuel assembly burnup limit; therefore, this bulletin supplement should not apply to reactors fueled with FCF fuel.

Sincerely,

M. S. Tuckman

Michael S. Tuckman

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| 50-369 | William B. McGuire Nuclear Station, Unit 1, Duke Powe | 05000369 |

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TUCKMAN,M.S. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION
Rules & Directives Review Branch (Post 920323)

SUBJECT: Comment opposing proposed NRC bulletin 96-001,suppl 1, "CR Insertion Problems."

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27629
62 FR 26729
May 20, 1997

(10)

**DUKE POWER**

June 13, 1997

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop T-6D-69
Washington, DC 20555-0001



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Michael S. Tuckman

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