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U. S. Nuclear Regulatory Commission
Mail Stop T-6D-69
Washington, D. C. 20555-0001

FARLEY NUCLEAR PLANT
VOGTLE ELECTRIC GENERATING PLANT
COMMENTS ON DRAFT SUPPLEMENT TO BULLETIN 96-01
CONTROL ROD INSERTION PROBLEMS

Ladies and Gentlemen:

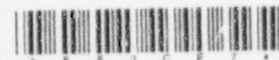
Southern Nuclear Operating Company (SNC) has reviewed the NRC's proposed supplement to Bulletin 96-01 on control rod insertion problems. In accordance with the request for comments, SNC endorses the comments of the Nuclear Energy Institute (NEI) and those of the Westinghouse Owners' Group (WOG). In addition, in the Attachment to this letter, SNC reiterates some comments provided by NEI and the WOG and also offers additional comments.

SNC has closely followed the small number of cases where incomplete RCCA insertion (IRI) has occurred and has taken appropriate data at Farley Nuclear Plant (FNP) and Vogtle Electric Generating Plant (VEGP). SNC has contributed its data to industry groups and has reviewed in detail with Westinghouse the aspects of this issue. SNC is in complete agreement that IRI is not acceptable. However, we do not believe that the proposed Bulletin supplement will aid in the on-going efforts to resolve the IRI issue, and may actually be adverse to safety by requiring unnecessary mid-cycle shut downs and start ups of many units.

Sincerely,

C. K. McCoy

Attachment
xc (See next page)



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PDR I&E
MISC PDR

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U. S. Nuclear Regulatory Commission, Washington, DC
J. I. Zimmerman, Project Manager - Farley
L. L. Wheeler, Senior Project Manager - Vogtle

U. S. Nuclear Regulatory Commission, Region II
L. A. Reyes, Regional Administrator
T. M. Ross, Senior Resident Inspector - Farley
C. R. Ogle, Senior Resident Inspector - Vogtle

ATTACHMENT

FARLEY NUCLEAR PLANT VOGTLE ELECTRIC GENERATING PLANT DRAFT SUPPLEMENT TO BULLETIN 96-01 CONTROL ROD INSERTION PROBLEMS

Burnup Threshold Too Low

The proposed bulletin supplement identifies a burnup threshold of 40,000 MWD/MTU, above which control rod drop time testing of 12-foot fuel with Intermediate Flow Mixing (IFM) grids is required. The 40,000 MWD/MTU threshold is too low for 12-foot fuel with IFM grids. Extensive rod drop time testing and root cause testing of fuel with IFM grids in several plants at burnups between 40,000 and 55,000 MWD/MTU has been completed. The data show that Westinghouse fuel with IFM grids can operate to substantially higher burnup than 40,000 MWD/MTU without experiencing increased drag that could indicate potential for incomplete RCCA insertion (IRI).

The proposed supplement also expresses concern that thimble tube distortion in fuel assemblies with IFM grids could lead to IRI very high in the core. This phenomenon has not been observed, nor do the drag or rod drop test data indicate that fuel is approaching a threshold where this is a realistic concern. As noted in the WOG comments, drag and drop test data for fuel with IFM grids clearly indicate that there is no indication of thimble tube distortion in the top of assemblies that could lead to control rods sticking high in the core.

The draft supplement also establishes the same burnup threshold for fuel types which have different fast fluences at equal burnups. Fast fluence is the appropriate parameter to determine when IRI may occur. The Westinghouse root cause conclusion for the IRI observations at Wolf Creek states that the increased compressive load was caused by unusual fuel assembly growth over and above what would normally be expected. Growth of fuel components is more appropriately correlated to fast neutron fluence than to fuel assembly burnup. Fast fluence is used as the independent variable to plot growth and drag in the Westinghouse root cause report. However, different fuel designs reach a given fast fluence at different burnups. For example, Westinghouse VANTAGE 5H fuel reaches a fast fluence of 9.28×10^{21} neutrons/cm² at a burnup of 49,000 MWD/MTU while VANTAGE 5 fuel does not achieve the same fast fluence until a burnup of about 51,700 MWD/MTU. Therefore, on a fluence basis, it would be appropriate for a burnup threshold for testing for VANTAGE 5 fuel to be higher than that for VANTAGE 5H fuel.

Considering the discussion above, the proposed burnup limit of 40,000 MWD/MTU provides approximately 12,000 to 15,000 MWD/MTU margin for 12-foot VANTAGE 5 fuel with IFM grids, a fuel type for which IRI has never been observed in-reactor. This amount of margin is overly conservative. For 14-foot fuel the draft supplement indicates a margin of 1000 to 2000 MWD/MTU between the proposed guideline value and the

ATTACHMENT (CONTINUED)

FARLEY NUCLEAR PLANT VOGTLE ELECTRIC GENERATING PLANT DRAFT SUPPLEMENT TO BULLETIN 96-01 CONTROL ROD INSERTION PROBLEMS

experience base for IRI. This is a reasonable degree of margin and should similarly be applied to 12-foot fuel.

Low Safety Significance for Credible Scenarios

The primary safety concern from IRI is loss of shutdown margin. For scenarios involving the approximate magnitude of the IRI observed at Wolf Creek, IRI is not safety significant for either Southern Nuclear PWR plant and does not justify mid-cycle shutdowns to take data.

Economic Penalty

The safety significance of IRI is small relative to the economic penalty created for Southern Nuclear by the proposed actions.

Previous operating experience and data indicate that control rods have operated successfully far in excess of 40,000 MWD/MTU in fuel with IFM grids. Therefore, the additional knowledge to be gained by mid-cycle testing beginning when rodded assemblies reach 40,000 MWD/MTU is insignificant. End-of-cycle rod drop time testing can provide essentially the same information without the large economic penalty associated with mid-cycle testing.

The cost of replacement power as a result of the proposed mid-cycle hot rod drop time testing is conservatively estimated to be \$2,500,000 for the current Farley and Vogtle operating cycles. This estimate assumes that the proposed supplement becomes effective in July, that Southern electric system load conditions are not extreme, that tests are performed on weekends when system loads are generally lower, and that each test results in the loss of only one effective full power day (EFPD) of generation. This estimate also presumes that Southern Nuclear will have enough flexibility in applying the burnup limits to coordinate outages such that no two units are taken off line for testing at the same time.

Negative Effects on Safety

In addition to replacement power costs, there are other negative implications of complying with the proposed supplement. The actions in the proposed supplement will have a

ATTACHMENT (CONTINUED)

FARLEY NUCLEAR PLANT VOGTLE ELECTRIC GENERATING PLANT DRAFT SUPPLEMENT TO BULLETIN 96-01 CONTROL ROD INSERTION PROBLEMS

negative effect on operations. To shut down and start up exposes the plant to an operationally complicated transient. Although fully within analyzed and approved margins, such transients increase the probability of equipment failures, plant trips, and challenges to safety systems.

The proposed actions will result in more planned shut downs and start ups near end of life (EOL). EOL is one of the most undesirable times in core life to shut down a PWR. At the end of core life, reactor coolant system (RCS) boron concentrations are low in comparison to beginning of life. The lower the RCS boron concentration, the larger the amount of water necessary to make reactivity changes. Compensating for the effects of xenon during an EOL startup can be challenging.

Lack of Closure Mechanism

The proposed actions would appear to be applicable indefinitely. The NRC should ask licensees to define, as part of their responses, an appropriate closure mechanism.

Reporting Period Too Short

The thirty day period allowed for reporting test data to the NRC is an unreasonable burden given that most of this data will be taken during a refueling outage. A longer time period to send in the test data, sixty days at least, would be more appropriate.