



June 19, 1997

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

Attention: Chief, Rules Review and Directives Branch

Subject: Proposed Generic Communications: Control Rod Insertion Problems

Braidwood Station Units 1 and 2
Byron Station Units 1 and 2
Zion Station Units 1 and 2
NRC Docket Nos. 50-456/457, 50-454/455 and 50-295/304

- References: 1) Proposed NRC Bulletin 96-01 Supplement 1; Control Rod Insertion Problems (62 *Fed. Reg.* 27629)
- 2) "Westinghouse Owners Group Comments on Proposed NRC Bulletin 96-01 Supplement; Control Rod Insertion Problems Notice of Opportunity for Public Comment (62 *Fed. Reg.* 27629) (Proprietary and Non-Proprietary), " OD-97-061, dated June 18, 1997.

The purpose of this letter is to provide the Nuclear Regulatory Commission (NRC), Commonwealth Edison Company's (ComEd) comments and request changes be made to the proposed supplement to NRC Bulletin 96-01, "Control Rod Insertion Problems." In addition to these comments, ComEd, a member of the Westinghouse Owner's Group (WOG), supports the WOG response (Reference 2). The key points in the WOG response are:

- Incomplete Rod Insertion (IRI) is of minimal safety significance based on adequate shutdown margin and no demonstrated loss of function.
- The proposed actions are not commensurate with the minimal safety significance of the issue.
- The Backfit Rule should apply and the NRC should perform a cost/benefit analysis of the proposed actions.
- The proposed actions will cause substantial economic impact.
- Burnup limits and testing requirements for specific fuel and plant types are more appropriately based on previously acquired test data correlated by the Westinghouse Mechanical Model.
- The proposed actions will actually be a detriment to plant safety by increasing core damage frequency.
- The industry needs closure on this issue.
- Based on the above key points the issuance of a supplement as proposed is not warranted.

The following are ComEd-specific comments.

Use of ComEd-Specific Fuel Features and Operating Parameters

ComEd plants have specific fuel features and operating parameters that need to be considered when determining appropriate burnup criteria for testing and evaluation and should not be subjected to generic burnup criteria. ComEd-specific fuel features include ZIRLO™, Integral Flow Mixing (IFM) grids.

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smaller diameter fuel rods and debris mitigation grids. The ComEd-specific operating differences include lower assembly average power levels and lower operating temperatures than the plants that have exhibited IRI.

The differences in our fuel features and operating parameters demonstrate the need to use the Westinghouse mechanical model to determine susceptibility of our plants to IRI. The mechanical model demonstrates that the fuel types at our plants are not susceptible to IRI until a much higher burnup value than that specified in the proposed supplement. ComEd has reviewed WCAP-14782 and agrees that the evidence to date supports the Westinghouse conclusions.

Use of ComEd-Specific Safety Evaluations

Plant-specific safety evaluations that consider design shutdown margin should also be used when determining the need for testing and testing frequency. The IRI problem is not safety significant at ComEd's PWRs because of conservative shutdown margins. When the IRI problem first became evident at Wolf Creek and South Texas, ComEd evaluated the shutdown margin for our operating units. The results demonstrate that acceptable shutdown margin exists for all ComEd PWR cores. This evaluation used control rod configurations that bounded the conditions described in NRC Bulletin 96-01. Therefore, in the improbable event that the IRI problem occurs on a ComEd PWR core, there will be no reduction of safety or loss of function. ComEd implemented a "shutdown margin with IRI" design check prior to NRC issuance of NRC Bulletin 96-01 which has been used in all subsequent reload designs. Reference 2 provides additional information that supports the position that shutdown margin has been and continues to be acceptable with respect to postulated IRI events.

Adverse Effects on Safety of the Proposed Actions

The NRC should consider the adverse effects of the proposed actions. Limiting rodded fuel assembly burnup in core designs does not necessarily result in safer cores. ComEd studies show that limiting rodded assembly burnups to 40,000 Megawatt Days per Metric Ton (MWD/MTU) can result in decreased margin of nuclear parameters such as peaking factors and Moderator Temperature Coefficient (MTC). Although these parameters remain within licensed limits, operating margins are reduced. A nuclear designer cannot effectively maximize margin and concurrently limit rodded assembly burnup within the ranges specified in the proposed supplement. Changes in a current cycle core design potentially have profound effects on future cycles. A negative consequence in a current cycle often can become worse in the next cycle. For example, underutilized fuel in a given cycle results in a more positive MTC value in the next cycle.

Multiple shutdowns make burnup projections, and consequently the ability to meet core design assumptions difficult. Failure to meet a core design assumption can result in multiple, expedited core redesigns or changes in operating power levels. Both of these situations lead to less desirable operating conditions and increased costs. For example, a unit may be required to operate at reduced power for greater than two weeks to meet a core design cycle burnup assumption. Or, failure to meet the core design cycle burnup assumption would require evaluations to demonstrate compliance with analysis bases, increase costs due to additional evaluation requirements, and will likely reduce available operating margin.

In addition to the negative safety significance of the proposed burnup limit on core designs, the proposed actions will have a negative effect on operations. To needlessly (without a true safety concern) shutdown and startup a reactor exposes the plant to an undue, operationally complicated transient.

The proposed supplement would require a significant increase in the number of PWR shutdowns at End-Of-Life (EOL) conditions. At EOL, Reactor Coolant System (RCS) boron concentrations are low in comparison to Beginning-Of-Life (BOL) concentrations. The lower the RCS boron concentration, the larger the amount of water that is necessary to make reactivity changes. The result of this effect is to require the use of large amounts of RCS water for dilution, which increases operating costs and potentially increases radioactive effluent. Compensating for the effects of xenon during an EOL startup can be challenging to operators and reactor engineers. ComEd has a large operating experience base from past load following operations on six units. In general, our practice on dealing with an EOL startup is to wait

until xenon has decayed away. This is typically 72 hours. The net effect under the requirements of the proposed supplement would be an outage of three days duration to perform a twelve-hour rod drop test.

ComEd is concerned with the effects that EOL shutdowns will have on the entire industry. Although ComEd has a large experience base on multiple units, other utilities may not have this experience. Learning how to effectively handle EOL xenon control under pressures of returning a unit to power during the summer imposes a highly undesirable situation on the industry.

Designing to the proposed rodged assembly burnup limits will increase reactor vessel neutron fluence due to less efficient core designs. Increasing vessel fluence over the life of the vessel reduces material integrity margins and results in increased costs due to the actions necessary to counteract the increased neutron fluence.

Economic Impact

As discussed in Reference 2, we believe the backfit rule applies. This requires the NRC to evaluate the costs of implementing the proposed actions. We have estimated the cost to ComEd of the proposed actions to be \$ 11,700,000 over the next 18 months. This includes \$1,600,000 for additional fuel to reduce the burnup at rodged core locations and \$10,100,000 for replacement power costs incurred for shutdowns during testing. The estimated shutdowns over this 18 month period for ComEd, based on the rules in the proposed supplement to NRC Bulletin 96-01, are as follows:

ComEd Plant	Unit	Cycle	Number of Shutdowns
Byron	1	8	2
Byron	2	7	4
Braidwood	1	7	1
Braidwood	2	6	2
Zion	1	15	3
Zion	2	15	5

The proposed actions will also cause underutilized fuel to be prematurely discharged to the spent fuel pools. This results in prematurely reaching full spent fuel pool storage capacity and would require accelerating plans and incurring additional expenses associated with long-term spent fuel storage without a national waste repository.

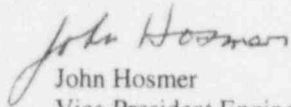
Summary

In conclusion, ComEd recommends that the NRC-proposed testing requirements of NRC Bulletin 96-01 be performed in accordance with the WOG recommendations (Reference 2). The basis for this recommendation is that the IRI problem is not safety significant based on the shutdown margin designed into the cores, industry test data and conclusions reached by Westinghouse analysis and root cause investigation. The Westinghouse mechanical model should be used to determine fuel type and plant-specific IRI susceptibility and testing. The Backfit Rule does apply and the NRC should perform a cost/benefit analysis of the proposed actions. The safety significance of the Incomplete Rod Insertion issue is not commensurate with the \$ 11.7 million that ComEd will expend over the next 18 months to meet the requirements of the proposed supplement to NRC Bulletin 96-01.

June 18, 1997

If you have any questions, please call Denise Saccomando at 630-663-7283.

Sincerely,



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