Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

March 3, 1989

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

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
LaSalle County Station Units 1 and 2
Response to NRC Bulletin No. 88-07, Supplement 1
Docket Nos. 50-237/249, 50-254/265
50-373/374

Reference: (a) NRC Bulletin No. 88-07, Supplement 1, dated December 30, 1988.

Dear Sir:

Reference (a) requested that holders of operating licenses for boiling water reactors (BWRs) provide additional information concerning power oscillations, and to request that addressees take action to ensure that the safety limit for the plant minimum critical power ratio (MCPR) is not violated.

Commonwealth Edison has performed the actions requested by Reference (a) for Dresden, Quad Cities, and LaSalle County Stations as described in the attachment to this letter.

To the best of my knowledge and belief, the statements contained above are true and correct. In some respect these statements are not based on my personal knowledge, but obtained information furnished by other Commonwealth Edison employees, contractor employees, and consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

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Please address any questions that you or your staff may have concerning this response to this office.

Respectfully,

Milton Richter

M. H. Richter
Nuclear Licensing Administrator

rf/5570K4

Attachment

cc: A.B. Davis
Resident Inspectors - D/QC/LSC

Subscribed and Sworn to
before me this 3rd day
of March, 1989

Debra J. Mayo
Notary Public

ATTACHMENT

Commonwealth Edison Response for Dresden, Quad Cities, and LaSalle Stations to NRC Bulletin 88-07, Supplement 1.

Commonwealth Edison (Edison) has reviewed NRC Bulletin 88-07, Supplement 1, (the supplement) which directed all holders of BWR operating licenses or construction permits to take action to ensure that the Minimum Critical Power Ratio (MCPR) safety limit is not violated during postulated core instabilities. The supplement was prompted by preliminary BWR Owners Group (BWROG) evaluations which indicated that regional power oscillations may, under certain conditions, challenge the MCPR safety limit prior to Reactor Protection System initiation.

The actions required by the supplement and Edison's response to these items are provided in the following paragraphs.

Action 1

Within 30 days of receipt of this supplement, all BWR licensees should implement the General Electric (GE) interim stability recommendations. However, for those plants that do not have effective automatic scram protection in the event of regional oscillations, a manual scram should be initiated under all operating conditions when two recirculation pumps trip while the reactor is in the RUN mode.

Response

In an October 1988 meeting, the BWROG presented to utilities the potential safety consequences associated with regional core instabilities. On October 28, 1988, Edison notified the NRC in accordance with 10 CFR 50.9 of these safety concerns and of our intentions to promptly implement operating restrictions to mitigate the consequences of regional oscillations. These operating limitations were discussed as part of the NRC notification, and implemented at Edison's BWR stations via a November 4, 1988 directive from the Vice-President of BWR Operations. These operating restrictions, implemented through standing orders, are more conservative than the supplement recommendations by:

- Limiting operating Flow Control Line (FCL) to 100% during normal operation at all three Edison BWR stations.

- Requiring Dresden and Quad Cities Stations (defined as group 1 plants) to implement a manual scram whenever operating below 45% core flow while above the 100% FCL.

The Edison imposed restrictions did not directly include the requirement for a manual scram at LaSalle Station (a group 2 plant) in the event of a two pump trip while operating in the RUN mode. The manual scram was initially enforced by the Confirmatory Action Letter (CAL) which resulted from the March 9, 1988 event, and Edison had decided to leave it in effect following CAL closure. For the reasons outlined above, the Edison operating restrictions meet the requirements of Action 1.

Edison's initial restrictions were intentionally very conservative because they were implemented prior to a complete review of GE's interim restrictions by the NRC. With the issuance of the supplement, the NRC has completed their review and Edison has taken steps to remove the conservatisms outlined above to more closely comply with the operating restrictions outlined in the supplement. The conservative operating restrictions imposed by Edison will, however, remain in effect until appropriate station procedures are modified to comply with the recommendations of the supplement.

As an overview, the procedure changes being implemented at Edison include: (1) normal unit startup and shutdown procedures to circumvent regions A, B and C; (2) abnormal operating procedures that address instabilities or provide guidance during situations that potentially place the unit in an unstable regime (i.e., recirculation pump trip); and (3) annunciator procedures that could provide early symptoms of a reactor core instability. This class of annunciator procedure (LPRM upscale alarm, etc.) will refer operators to abnormal operating procedures which provide detailed guidance for detecting and suppressing instabilities. A manual scram is required whenever 10% peak-to-peak LPRM or APRM oscillations are detected.

Although the attachment to the supplement explicitly states that intentional operation shall not be allowed below 40% core flow when above the 80% flow control line (regions A and B), Edison has recognized the need for such entry in the event of unforeseen problems that challenge vital equipment or fuel (i.e., tripping recirculation pumps in response to mechanical problems or reducing load with recirculation flow to mitigate preconditioning overpowers). Such entry will not be interpreted as intentional operation. Once these regions are entered, the appropriate actions will be implemented as outlined in the supplement. It should be noted that this interpretation of the supplement restriction on "intentional operation", along with other interpretations to ensure a consistent and practical approach to implementing the recommendations of the supplement, were generically addressed by the BWROG in a letter to the NRC (D. Grace letter to A. Thadani, dated January 26, 1989, "NRC Bulletin No. 88-07, Supplement 1, Power Oscillations in Boiling Water Reactors").

Action 2

The boundaries of Regions A, B, and C of the GE recommendations were derived for those BWRs using NRC approved GE fuel. For BWRs using fuel supplied by other vendors, these regions should be adopted in principle, but the power/flow boundaries should be based on existing boundaries that have been previously approved by the NRC. For proposed new fuel designs, the stability boundaries should be reevaluated and justified based on any applicable operating experience, calculated changes in core decay ratio using NRC approved methodology, and/or core decay ratio measurements. There should be a high degree of assurance that instabilities will not occur under any circumstances of operation in Region C.

Response

Dresden Station Units 2 and 3 are currently the only Edison BWRs using non-GE fuel (the current fuel supplier for Dresden is Advanced Nuclear Fuels - ANF). At this time, both units are comprised of two reloads of ANF 8X8 fuel and two reloads of ANF 9X9 fuel. NRC approved methods have traditionally been used for analyzing the stability of ANF supplied fuel. Because the design of the ANF 8X8 fuel is similar to GE 8X8 fuel, no additional stability concerns have been identified. During the licensing of ANF 9X9 fuel, stability analyses indicated that this design was slightly less stable than ANF 8X8 fuel. For this reason, the NRC required Dresden Station to implement Technical Specification stability surveillances during Single-Loop Operation (SLO).

Both the Edison imposed operating restrictions, and those established in the supplement, envelope the SLO Technical Specifications at Dresden Station. That is, all stability related Technical Specifications are met under the new operating restrictions. It should be noted that the Technical Specifications define a surveillance region between 39% and 45% core flow above the 80% FCL. Under the new requirements, operation in this region is prohibited. (The supplement allows operation in Region C - between 40% and 45% core flow above the 80% FCL for fuel preconditioning considerations; however, Edison has elected to avoid this region altogether during normal operation).

For proposed new fuel designs, the stability regions will be reevaluated to ensure unstable operation is avoided during normal and abnormal operation.

Action 3

The BWROG recommendations are ambiguous with respect to permissible conditions for entry of Regions B and C. Although the recommendations state that intentional operation in Region B is not permitted and operation in Region C is permitted only for purposes of fuel conditioning during rod withdrawal startup operations, intentional entry into Region B or C is also allowed in situations where rod insertion or a flow increase is required by procedures to exit Regions A and B after unintentional entry. Licensees should ensure that the procedures and training employed for implementation of these recommendations avoid any similar ambiguity which could lead to operator confusion.

Response

In order to avoid confusion in operator procedures, Regions A, B, and C will be combined to the extent possible at all three BWRs. Because Edison is not allowing operation in Region C, all three regions will be combined at Dresden and Quad Cities Stations (the required corrective actions are identical for each region). Similarly, LaSalle Station will combine Regions B and C. This strategy eliminates the possibility of operator confusion because Dresden and Quad Cities Stations have only a single restrictive region, and although LaSalle Station has two restrictive regions, a scram is required when Region A is entered.

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