UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

TIC

AUG 29 1980

Docket Nos. 50-10, 50-237,
50-249; 50-254, 50-265

Commonwealth Edison Company
ATTN: Mr. Cordell Reed
Vice President
Post Office Box 767
Chicago, IL 60690

Gentlemen:

The enclosed IE Bulletin No. 79-26, Revision 1, is forwarded to you for action. The original IE Bulletin No. 79-26 has been revised to adjust the required completion date for reporting the results of examination of an exposed control blade and to correct a typographical error. The revision is identified by use of "R1" in the right margin.

In order to assist the NRC in evaluating the value/impact of each bulletin on licensees, it would be helpful if you would provide an estimate of the manpower expended in conduct of the review and preparation of the reports required by the bulletin. Please estimate separately the manpower associated with corrective actions necessary following identification of problems through the bulletin.

A written response is required. If you desire additional information regarding this matter, please contact this office.

Sincerely,

Glen W. Rey
for James G. Keppler
Director

Enclosure: IE Bulletin
No. 79-26, Revision 1

cc w/encl:
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SSINS No.: 6820
Accession No.:
8006190042

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

August 29, 1980

IE Bulletin No. 79-26 Rev. 1

BORON LOSS FROM BWR CONTROL BLADES

Description of Circumstances:

The General Electric Company (GE) has informed us of a failure mode for control blades which can cause a loss of boron poison material. Hot cell examinations of both foreign and domestic blades have revealed cracks near the upper end of stainless steel tubing and loss of boron from the tubes. The cracks and boron loss have so far been confined to locations in the poison tubes with more than 50 percent Boron-10 (B^{10}) local depletion. Observed crack sizes range from a quarter to a half inch in length and from one to two mils in width.

GE has postulated that the cracking is due to stress corrosion induced by solidification of boron carbide (B_4C) particles and swelling of the compacted B_4C as helium and lithium concentrations grow. Once primary coolant penetrates the cladding (i.e., the cracking has progressed through the cladding wall and the helium-lithium pressures are sufficient to open the crack), boron is leached out of the tube at locations with more than 50 percent B^{10} local depletion (local depletion is considered to be twice the average depletion). It was further found with similar cracking but with less than 50 percent local depletion of B^{10}, that leaching did not occur even though primary coolant had penetrated the cladding.

The cracking and boron loss shorten the design life of the control blade. According to the GE criteria the end of design life is reached when the reactivity worth of the blade is reduced by 10 percent, which corresponds to ^{10} quarter of the control blade. d the allowance for B^{10} deple- l blade from the 42 percent