

tic



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

11-20-79

Docket No. 50-346

Toledo Edison Company
ATTN: Mr. Richard P. Crouse
Vice President
Energy Supply
Edison Plaza
300 Madison Avenue
Toledo, OH 43652

Gentlemen:

The enclosed IE Bulletin No. 79-26 is forwarded to you for information.
No written response is required. If you desire additional information regarding
this matter, please contact this office.

Sincerely,

James W. Roy
for James G. Keppler
Director

Enclosure: IE Bulletin
No. 79-26

cc w/encl:
Mr. T. Murray, Station
Superintendent
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDR
Local PDR
NSIC
TIC
Harold W. Kohn, Power
Siting Commission
Helen W. Evans, State
of Ohio

1502 343

Q 7912050 410

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

SSINS: 6820
Accession No.:
7910250475

November 20, 1979

IE Bulletin No. 79-26

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 42 percent B^{10} depletion averaged over the top quarter of the control blade. Because of the leaching mechanism, GE has reduced the allowance for B^{10} depletion averaged over the top quarter of the control blade from

The safety significance of boron loss is in terms of its effect on shutdown and scram reactivity. Although shutdown ca

1502 344

DUPLICATE DOCUMENT

Entire document previously
entered into system under:

ANO 7910250475

No. of pages: 6