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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION V  
1990 N. CALIFORNIA BOULEVARD  
SUITE 202, WALNUT CREEK PLAZA  
WALNUT CREEK, CALIFORNIA 94596

August 29, 1980

Docket No. 50-133

Pacific Gas and Electric Company  
77 Beale Street  
San Francisco, California 94106

Attention: Mr. Philip A. Crane, Jr.  
Assistant General Counsel

Gentlemen:

The enclosed IE Bulletin No. 79-26, Rev. 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 report(s) 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,

R. H. Engelken  
Director

Enclosures:

- 1. IE Bulletin No. 79-26, Rev. 1
- 2. List of IE Bulletins  
Recently Issued

cc w/enclosures:

- J. D. Shiffer, PG&E
- E. Weeks, PG&E (Humboldt Bay)
- W. A. Raymond, PG&E

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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 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 42 percent value to 34 percent.

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RECENTLY ISSUED  
IE BULLETINS

Bulletin No.	Subject	Date Issued	Issued To
80-20	Failures of Westinghouse Type W-2 Spring Return to Neutral Control Switches	7/31/80	To each nuclear power facility in your region having an OL or a CP
80-19	Failures of Mercury-Wetted Matrix Relays in Reactor Protective Systems of Operating Nuclear Power Plants Designed by Combustion Engineering	7/31/80	All nuclear power facilities having either an OL or a CP
80-18	Maintenance of Adequate Minimum Flow Thru Centrifugal Charging Pumps Following Secondary Side High Energy Line Rupture	7/24/80	All PWR power reactor facilities holding OLs and to those PWRs nearing licensing
Supplement 2 to 80-17	Failures Revealed by Testing Subsequent to Failure of Control Rods to Insert During a Scram at a BWR	7/22/80	All BWR power reactor facilities holding OLs
Supplement 1 to 80-17	Failure of Control Rods to Insert During a Scram at a BWR	7/18/80	All BWR power reactor facilities holding OLs
80-17	Failure of Control Rods to Insert During a Scram at a BWR	7/3/80	All BWR power reactor facilities holding OLs
80-16	Potential Misapplication of Rosemount Inc., Models 1151 and 1152 Pressure Transmitters with Either "A" or "D" Output Codes	6/27/80	All Power Reactor Facilities with an OL or a CP
80-15	Possible Loss Of Hotline With Loss Of Off-Site Power	6/18/80	All nuclear facilities holding OLs
80-14	Degradation of Scram Discharge Volume Capability	6/12/80	All BWR's with an OL