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

OCT 30 1980

50-316

Those on Attached Address Listing:

This IE Information Notice No. 80-38 is forwarded to provide a notification of a potential source of degradation that might occur in a safety related component over long term operation. No specific action or written response is required at this time. If you have any questions related to this matter, please contact this office.

Sincerely,

James G. Keppler
Director

Enclosure: IE Information
Notice No. 80-38

cc w/encl:
Mr. D. W. Kane,
Sargent & Lundy
Reproduction Unit NRC 20b

A0 2

8101050209

SSINS No.: 6835
Accession No.:
8008220180
IN-80-38

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

October 30, 1980

IE Information Notice No. 80-38: CRACKING IN CHARGING PUMP CASING CLADDING

Description of Circumstances:

In January 1980 Commonwealth Edison Company (CECo) reported to the NRC that a radiographic examination had revealed crack indications in the cladding on the suction end plate of the 1A charging pump at Zion Unit 1. This centrifugal charging pump 1A is one of two pumps installed in Zion Unit 1 for high head safety injection of borated water to the reactor loops. These pumps are additionally utilized as charging pumps during normal operation. ASME Section XI inservice inspection rules referenced in the plant technical specification requires pump examination only once during the 10 year service interval and this pump had been in service about 7 years.

The pumps are 2-1/2 inch, 11 stage, Type IJ manufactured by the Pacific Pumps Division of Dresser Industries. The pump casing end assembly in the area of interest, Figure 1, consists of a suction end plate of A515 grade 60 carbon steel plate welded to the casing barrel forging of A266 class 1 carbon steel using an Inconel weldment. The entire inner surface is clad with type 308 stainless steel applied by submerged arc welding.

An in-situ ultrasonic examination conducted in late April confirmed clad cracking indications at the barrel case to end plate inner radius for approximately 330 degrees around the circumference and that the cracking possibly extended into the pump base material in the bottom 180 degrees of the assembly. A review of the original radiographs revealed crack like indications in the clad overlay, however, not to the extent observed during this examination.

Subsequently, the entire suction end of the pump was removed and cross sections metallographically examined to further evaluate the nature and extent of the cracking. It was determined that initiation and propagation of the clad cracks probably resulted from stress concentration and dilution effects in the initial corner bead pass due to the difficult access and bead sequencing required by the fairly sharp corner geometry. Extension of the cracks at the base metal-clad interface ranged to a depth of 1/16 inch maximum in the 1-1/2 inch thick base material. These crack tip areas were well blunted and slightly cavitated from corrosion effects due lengthy exposure to the localized boric acid attack. Examination of the crack morphology revealed that the clad cracking essentially arrested at the base metal-clad interface and that base metal corrosion progressed at a relatively slow rate.

The 1A charging pump was replaced with a new pump provided with a casing constructed entirely of stainless steel. The licensee is currently developing improved NDE procedures for examination of the three remaining pumps at the next refueling outage. Further, the licensee and pump manufacturer are developing repair procedures in the event cracks are discovered in the remaining pumps.

A corrosion evaluation provided CECo by Westinghouse indicates the corrosion rate of carbon steel subject to environmental conditions typical of the installed pumps is on the order of 2-1/2 to 4 mils per month. Additionally, a stress analysis of the pump casing by the manufacturer using ASME Section III, Subsection NC rules, indicates that at design conditions a flaw with depth of 0.763 inches could be tolerated.

Based on the available information no immediate safety concern is indicated. However, the observed conditions reveal a potential source of pump degradation over long term operations. Therefore, to assure maximum availability, it appears prudent to perform a nondestructive examination of this pump type at the earliest practical time during the first code required in-service inspection interval and if cracking is confirmed, take appropriate corrective actions per the rules of ASME Section XI BP&V Code.

This Information Notice is provided as a notificaton of a potential source of degradation of a safety related component that is still under review by the NRC staff. It is expected that recipients will review the information for possible applicability to their facility. No specific action or response is requested at this time. If you have any questions regarding this matter, please contract the director of the appropriate NRC Regional Office.

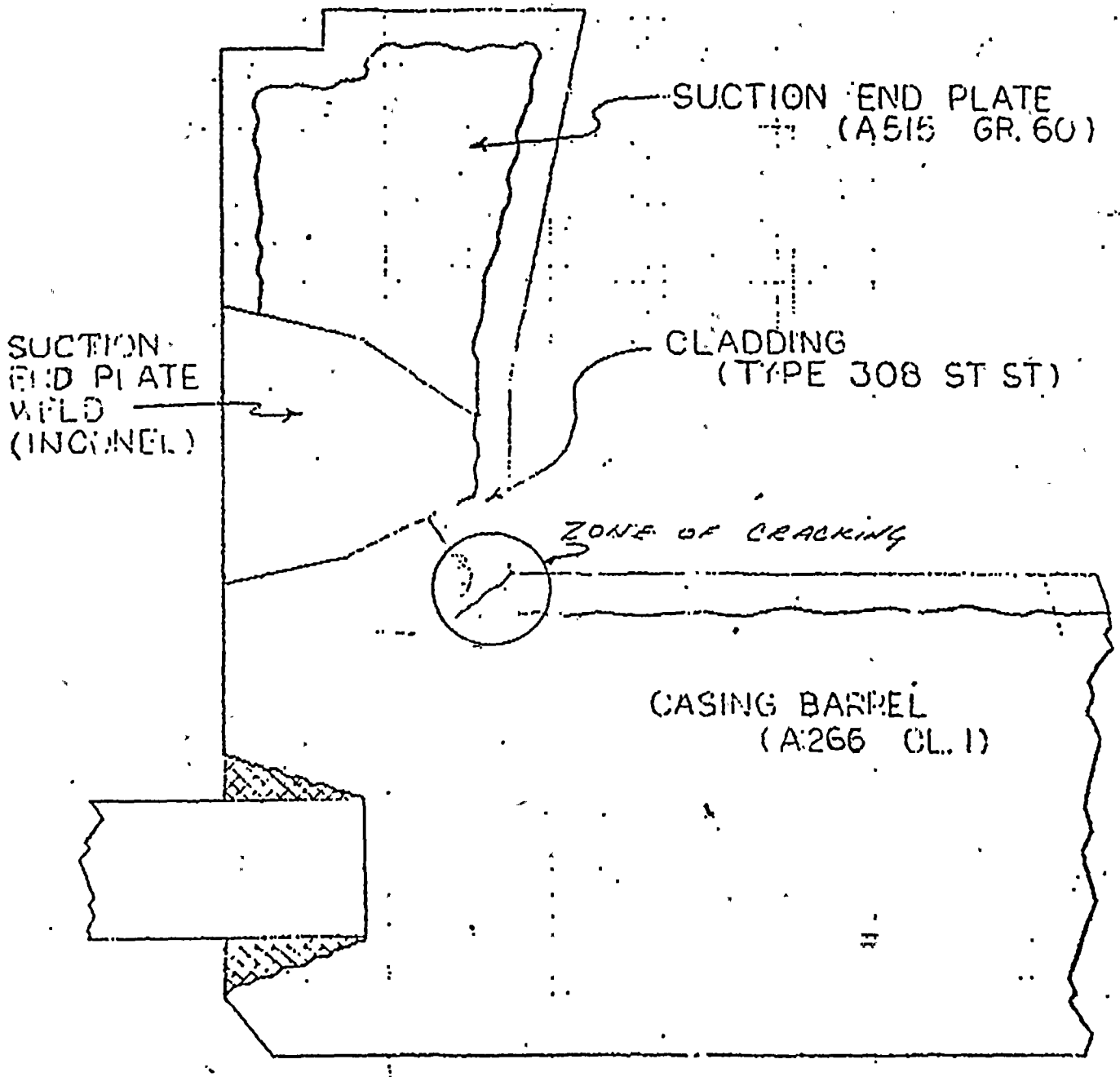
Enclosure:
Figure 1

RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
80-37	Containment cooler leaks and reactor cavity flooding at Indian Point Unit 2	10/24/80	All nuclear power facilities holding power reactor OLs or CPs
80-36	Failure of Steam Generator Support Bolting	10/10/80	All nuclear power reactor facilities holding power reactor OLs or CPs
80-35	Leaking and dislodged Iodine-124 implant seeds	10/10/80	All categories G and G1 medical licensees
80-34	Boron dilution of reactor coolant during steam generator decontamination	9/26/80	All pressurized water reactor facilities holding power reactor OLs
80-33	Determination of teletherapy timer accuracy	9/15/80	All teletherapy (G3) licensees
80-32	Clarification of certain requirements for Exclusive-use shipments of radioactive materials	8/12/80	All NRC and agreement state licensees
80-31	Maloperation of Gould-Brown Boveri Type 480 volt type K-600S and K-DON 600S circuit breakers	8/27/80	All light water reactor facilities holding OLs or CPs
80-30	Potential for unacceptable interaction between the control rod drive scram function and non-essential control air at certain GE BWR facilities	8/19/80	All boiling water reactor facilities holding power reactor OLs or CPs.
80-29	Broken studs on Terry turbine steam inlet flange	8/7/80	All light water reactor facilities holding power reactor OLs or CPs*

* Operating Licenses or Construction Permits

FIGURE 1


SUCTION END PLATE
(A515 GR. 60)
SUCTION
END PLATE
WELD
(INCONEL)
CLADDING
(TYPE 308 ST ST)
ZONE OF CRACKING
CASING BARREL
(A266 CL. 1)

RIII's CORPORATE ADDRESSES FOR OPERATING LICENSEES AND CONSTRUCTION PERMIT HOLDERS
(BWR's and PWR's)

Docket No. 50-263
Docket No. 50-282
Docket No. 50-306

Northern States Power Company
ATTN: Mr. Dennis E. Gilberts
Vice President
Power Production and System
Operation
414 Nicollet Mall
Minneapolis, MN 55401

cc w/encl:
Mr. W. A. Shamla,
Plant Manager
Mr. F. P. Tierney, Jr.,
Plant Manager
Central Files
Director, NRR/DPM
Director, NRR/DOR
AEOD
Resident Inspectors, RIII
PDR
Local PDR
NSIC
TIC
John W. Ferman, Ph.D.,
Nuclear Engineer, MPCA

Docket No. 50-546
Docket No. 50-547

Public Service of Indiana
ATTN: Mr. S. W. Shields
Senior Vice President
Nuclear Division
Post Office Box 190
New Washington, IN 47162

cc w/encl:
Mr. Steve J. Brewer, Nuclear
Safety and Licensing Supervisor
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDR
Local PDR
NSIC
TIC
LeBoeuf, Lamb, Leiby & MacRae
Mr. Dave Martin, Office of the
Attorney General
Mr. John R. Galloway, Staff
Director, Environment, Energy
and Natural Resources Subcommittee

RIII's CORPORATE ADDRESSES FOR OPERATING LICENSEES AND CONSTRUCTION PERMIT HOLDERS
(BWR's and PWR's)

Docket No. 50-346

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

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

Docket No. 50-483
Docket No. 50-486

Union Electric Company
ATTN: Mr. John K. Bryan
Vice President - Nuclear
P. O. Box 149
St. Louis, MO 63166

cc w/encl:
Mr. W. H. Weber, Manager,
Nuclear Construction
Central Files
Director, NRR/DPM
Director, NRR/DOR
PDR
Local PDR
NSIC
TIC
Region I & IV
Ms. K. Drey
Mr. Ronald Fluegge, Utility
Division, Missouri Public
Service Commission

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

OCT 30 1980

50-315/316 A/D 2

Those on Attached Address Listing:

This IE Information Notice No. 80-38 is forwarded to provide a notification of a potential source of degradation that might occur in a safety related component over long term operation. No specific action or written response is required at this time. If you have any questions related to this matter, please contact this office.

Sincerely,

James G. Keppler

James G. Keppler
Director

Enclosure: IE Information
Notice No. 80-38

cc w/encl:
Mr. D. W. Kane,
Sargent & Lundy
Reproduction Unit NRC 20b

AD 2

8101050209