



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
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ATLANTA, GEORGIA 30303

OCT 30 1980

In Reply Refer To:

RII:JPO


50-437

Offshore Power Systems  
ATTN: A. R. Collier, President  
P. O. Box 8000  
Jacksonville, FL 32211

Gentlemen:

This Information Notice 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 to this Information Notice is required at this time. If you have any questions related to this matter, please contact this office.

Sincerely,



James P. O'Reilly  
Director

Enclosures:

1. IE Information Notice No. 80-38  
w/Enclosure
2. List of Recently Issued  
IE Information Notices

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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 boroated 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 pump casing during the next refueling outage. Further, the licensee is currently developing repair procedures in the area of the charging pumps.

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