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 PAPAY, L.T. Southern California Edison Co.  
 RECIP. NAME RECIPIENT AFFILIATION  
 ENGELKEN, R.H. Region 5, San Francisco, Office of the Director

SUBJECT: Final deficiency rept, originally reported on 801226, re  
 inadequate design of fuel transfer tube. Multiple  
 longitudinal stiffener plates added between interface &  
 adjacent circumferential interface stiffener rings.

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L.J.

*Southern California Edison Company*

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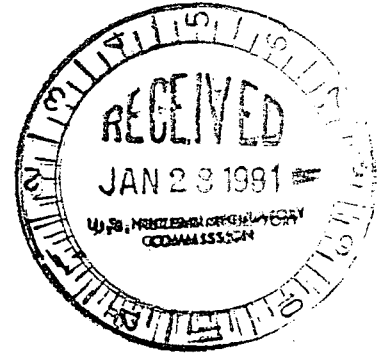
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L. T. PAPAY  
VICE PRESIDENT

TELEPHONE  
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January 16, 1981

Mr. R. H. Engelken, Director  
Office of Inspection and Enforcement  
U. S. Nuclear Regulatory Commission  
Region V  
Suite 202, Walnut Creek Plaza  
1990 North California Boulevard  
Walnut Creek, California 94506



Dear Mr. Engelken:

Subject: Docket Nos. 50-361 and 50-362  
San Onofre Nuclear Generating Station, Units 2 and 3

In a letter to your office dated December 26, 1980 we identified a condition which we consider reportable in accordance with 10CFR50.55(e). The condition concerns the inadequate design of the fuel transfer tube.

Enclosed in accordance with 10CFR50.55(e)(3) are twenty-five (25) copies of a report entitled, "Final Report on Fuel Transfer Tube Design Deficiency - San Onofre Nuclear Generating Station, Units 2 and 3."

If you have any questions regarding this report, we would be pleased to discuss them with you at your convenience.

Very truly yours,

A handwritten signature in dark ink, appearing to be "L. T. Papay".

Enclosures

cc: Victor Stello (NRC, Director I&E)  
R. J. Pate (NRC, San Onofre Units 2 and 3)

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# FINAL REPORT ON FUEL TRANSFER TUBE DESIGN DEFICIENCY

San Onofre Nuclear Generating Station, Units 2 and 3

## INTRODUCTION

This report is submitted pursuant to 10CFR50.55(e)(3). It describes a design deficiency identified in fuel transfer tubes installed at the San Onofre Nuclear Generating Station Units 2 and 3. This report includes a description of the deficiency, an analysis of the safety implications and a summary of the corrective actions taken to date. Confirmed notification of this condition was provided to the NRC by Southern California Edison per letter dated December 26, 1980.

## BACKGROUND

The fuel transfer tubes were designed and fabricated by Ametek-Straza Division, El Cajon, California (Ametek) under contract to Bechtel (the Engineer-Constructor for Units 2 and 3). During preparation for the combined Structural Integrity/Integrated Leak Rate Test of the Unit 2 containment alternate means of performing a local leak rate test on the fuel transfer tube containment pressure boundary bellows were discussed. One alternative required pressurizing the bellows in a direction opposite to the design basis condition. To further evaluate the feasibility of this alternative a design review was initiated. The results of this review indicated that the stress level in the fuel transfer tube shell at the attachment of the circumferential stiffener ring at the containment pressure boundary bellows interface was in excess of the specified code allowables; consequently, a complete design review was initiated.

## DISCUSSION

The following discussion is responsive to 10CFR50.55(e)(3).

## DESCRIPTION OF DEFICIENCY

A complete review of the Ametek stress report for the fuel transfer tube indicated that no stress calculations were performed for the fuel transfer tube shell at the attachment points of the circumferential stiffener rings at the containment pressure boundary bellows interface or at the transfer canal wall penetration interface. Subsequent calculations indicate stress levels in excess of specified code allowables at both of these locations.

### ANALYSIS OF SAFETY IMPLICATIONS

During plant operation, the fuel transfer tube functions as the containment pressure boundary. Inside the containment structure the tube is supported at the transfer canal wall penetration and is attached to the balance of the containment pressure boundary by means of a metallic expansion bellows. If the cited deficiency had gone undetected, the structural integrity of the fuel transfer tube and, therefore, the containment pressure boundary may have been compromised during the postulated design basis accident. In this event the containment pressure boundary may not have been able to perform its intended safety function.

### CORRECTIVE ACTION

The deficiency has been corrected by the addition of multiple longitudinal stiffener plates between the circumferential interface stiffener rings and existing adjacent circumferential stiffener rings. Incorporation of these longitudinal stiffener plates into the fuel transfer tube design reduces the stress concentration at the attachment points of the circumferential interface stiffener rings thereby reducing the resulting stress levels to within the specified code allowables. This corrective action has been implemented in the Unit 2 fuel transfer tube assembly and has successfully undergone the containment Structural Integrity Test. The Unit 3 corrective action is currently scheduled for completion by June, 1981.