

LOUISIANA POWER & LIGHT COMPANY

WATERFORD SES UNIT NO. 3

Final Report of
Significant Construction Deficiency No. 16

Control Element Drive Mechanism Guide Cones Off-Set

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FINAL REPORT
SIGNIFICANT CONSTRUCTION DEFICIENCY NO. 16
CONTROL ELEMENT DRIVE MECHANISM GUIDE CONES OFF-SET

Introduction

This report is submitted pursuant to 10CFR50.55(e). It describes a deficiency between the Control Element Drive Mechanism (CEDM) Guide Cones and CEDM penetration assemblies interface.

Background

By telephone conversation on May 29, 1980, Louisiana Power & Light notified the Nuclear Regulatory Commission concerning a deficiency that had been identified during an inspection conducted at the Waterford 3 Site by Combustion Engineering. The deficiency involved an apparent offset (non-concentric) condition located at the shoulder interface between the top of the guide cones and bottom of the CEDM penetration assemblies. The CEDM guide cones are installed (threaded and tack welded) on the underside of the reactor vessel head at each CEDM nozzle location. These cones serve to guide the tips of the CEA extension shafts into the nozzles and motor housings when the head is lowered onto the vessel. They do not serve any other function.

Description of Deficiency

On May 7, 1980, a Combustion Engineering Field Engineering Service Engineer, a Combustion Engineering Site Representative and a Nuclear Installation Services Company (NISCO) Inspector examined all ninety-one (91) of the CEDM housing assemblies from the underside of the reactor vessel head for the purpose of establishing corrective action for conditions previously identified by NISCO. This examination detected that an apparent offset (non-concentric) condition existed in some of the CEDM assemblies. Subsequently, Combustion Engineering confirmed that sixteen (16) guide cones were offset by approximately 1/32", five (5) as being offset by approximately 1/16", and one (1) as being offset by approximately 1/8". Further, Combustion Engineering established that this condition existed at the time of shipment. An initial evaluation conducted by CE Windsor Engineering and Licensing indicated that the offset condition could possibly produce some rubbing or interference on a Control Element Assembly (CEA) extension shaft during a scram which could increase the time for the rod to insert completely.

Analysis of Safety Implications

The engineering review performed to determine the safety significance of this condition determined that the cones do not form a part of the Reactor Coolant Pressure Boundary, and the integrity of the Reactor Vessel was not in any way affected.

The FSAR, Subsection 15.0.2, states that the Chapter 15 accident analyses are based on the CEA's reaching their ninety percent insertion position in 2.7 seconds.

It is possible that the offset of affected guide cones in the Reactor Vessel Head could, if left uncorrected, produce some rubbing or interference on a CEA extension shaft during a scram, thereby increasing the drop time.

Corrective Action

Combustion Engineering completed corrective repairs during the period from May 29 through June 2, 1980, and issued a Report of Welded Repair or Alteration, Form R-1, dated June 4, 1980.

Corrective action was accomplished in accordance with the disposition to Nonconformance Report W3-2107 and instructions provided by CE Traveler No. 99709527-001, dated May 28, 1980.

The repair consisted of mechanically grinding the twenty-two (22) cones to reduce the offset to zero (0) by using an air motor with carbide burrs to remove the offset metal. The air motor was mounted to an expanded mandrel set in the CEDM assembly. The zero offset was checked through the use of a straight edge placed against the assembly wall surfaces and extending down onto the guide cone wall surfaces. The guide cone surfaces were liquid penetrant examined, visually inspected, and verified as having met the requirements as delineated in the traveler.