

U.S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
REGION IV

Report No. 99900401/80-03

Company: Combustion Engineering Incorporated  
1000 Prospect Hill Road  
Windsor, Connecticut 06095

Inspection Conducted: December 9-11, 1980

Inspector: *Richard D. Chamberlain for* 12-30-80  
R. H. Brickley, Principal Inspector  
Program Evaluation Section  
Vendor Inspection Branch  
Date

Other Personnel: *David D. Chamberlain* 12-30-80  
D. D. Chamberlain, Contractor Inspector  
Vendor Inspection Branch  
Date

Approved by: *C. J. Hale* 12-31-80  
C. J. Hale, Chief  
Program Evaluation Section  
Vendor Inspection Branch  
Date

Summary

Inspection conducted on December 9-11, 1980 (99900401/80-03)

Areas Inspected: Implementation of 10 CFR 21 and 10 CFR 50, Appendix B, in the area of follow-up on two (2) 10 CFR 50.55(e) reports and action on previous inspection findings. The inspection involved twenty-four (24) inspector hours on-site by one NRC inspector.

Results: In the areas inspected, no items of noncompliance, deviations, or unresolved items were identified.

DETAILS SECTIONA. Persons Contacted

J. M. Bahr, Lead Engineer, RCS Analysis  
C. D. Blanchard, Staff Engineer  
K. A. Jones, Engineer, Reload Transients Group  
A. N. Major, Manager, Plant Components  
H. E. Neuschaefer, Consultant Physicist, Reactor Design  
E. L. Trapp, Supervisor, Reload Transients Group  
D. R. Wade, Supervisor, Pump Group  
E. M. Weisel, Cognizant Engineer, Plant Components  
P. W. Wielhouwer, Supervisor, Plant Components

B. Action on Previous Inspection Findings

1. (Closed) Deviation (Report No. 80-01): Certain quality related activities are not documented through written operating procedures for the Project Management organization.

The inspector verified the corrective actions and preventive measures described in the letter of response dated May 30, 1980, i.e. both QADP 5.7 (Design Change, Field Change, Corrective Action) and 6.3 (Deviation from Contract Requirement) were revised on October 1, 1980, to clarify that the Project Manager's approval is administrative in nature and that the Cognizant Engineer is responsible for determining the safety implication of the item and indicating whether the condition described in a Deviation from Contract Requirement (DCR) is a reportable deficiency.

2. (Closed) Deviation (Report No. 80-01): The responsibility for assuring that personnel performing activities affecting quality are suitably trained has not been met by the Project Management Organization.

The procedural clarifications, identified in the preceding paragraph, that define the activities of the Project Management Organization as not quality affecting eliminate this requirement for that organization.

3. (Closed) Unresolved Item (Report No. 80-01): It could not be demonstrated that the Administrative Policy Instruction API-17 (Reporting of Safety Hazards) is sufficient to provide effective implementation of 10 CFR 21 as described in Section 21.21(a) i.e. the activities conducted under QADP 5.7 appear to involve items that have the potential for being reportable, yet nowhere in this procedure is there a reference to 10 CFR 21 or API-17.

The examination of additional Field Action Requests (FAR) during this inspection (80-03) did not reveal any instance of insufficient documentation or failure to meet NRC reporting requirements. In view of these results, this item had been reevaluated and found to be resolved i.e. the existing system does not appear to violate NRC evaluation, documentation, and reporting requirements for such potential problems.

C. Shutdown Heat Exchanger Weld Cladding

This item was identified by WPPSS - Unit 3 and involved chloride contamination, below minimum design weld overlay thickness, and cracking of weld overlays on two (2) Shutdown Heat Exchangers (SDHX) manufactured by the Ametek, Schutte & Koertering Division, Bethayres Plant.

This item was previously inspected during Inspection No. 80-02 (See Report No. 99900401/80-02, Details Section I, paragraph C.2.b.(6)), however, additional defects have been found by C.E. and WPPSS on the two (2) Unit 3 SDHXs. An examination of a tube sample removed from one of the SDHXs revealed at least two (2) 20% radial defects on the I.D. of the longitudinal joint. These defects appeared to be a lack of fusion on the I.D. of the tube joint. In addition, I.D. and O.D. pits reportedly exceeding code allowables have been found along the I.D. and O.D. of the weld joint. Also, eddy current examination of 2244 tubes in the SDHXs revealed that 225 had significant inside surface defect indications. These tubes were purchased by Ametek from the Allegheny Ludlum Steel Corp., Wallingford Tubular Products Division. Ametek reportedly has a certification from Allegheny Ludlum that the material was eddy current tested to SA-450 and NC-2550 ASME Section III, Class 2, 1974 Edition thru Winter 1975 Addenda, Method E.T., and found to be acceptable. This item is currently being processed by C.E. under API-17 as a potential substantial safety hazard. Preliminary evaluations by C.E. indicate that these defective tubes may not pose a substantial safety hazard in C.E.'s application (SDHX), however, they are concerned that other users (NSSS/AEs) may have more critical applications of these tubes. No other action at C.E. appears warranted at this time, but this item will be followed up by our components group.

D. Partial Drainage of the RCS in Mode 5

This item is a follow-up of a 10 CFR 50.55(e) report by the Licensee (Florida Power & Light Company - St. Lucie Plant). The Licensee had been informed by C.E. that partial drainage of a St. Lucie 1 type reactor coolant system (RCS) while in Mode 5 is a condition that has not been analyzed for the boron dilution event. The effect of the reduced RCS volume on the analysis would be a predicted time to criticality that is less than the minimum time period for operator action, assuming no more than the Technical Specification shutdown margin of 1% existed at the start of the event.

1. Objectives

The objectives of this area of the inspection were to:

- a. Examine the results of the evaluation of this item to determine that a proper evaluation was performed.
- b. Determine whether this item is generic or plant unique.
- c. Determine if the QA program requirements were followed.
- d. Verify that the applicable reporting requirements were followed.

## 2. Method of Accomplishment

The preceding objectives were accomplished by an examination of the records maintained on this item consisting of a Northeast Utilities letter to C.E. dated February 22, 1980, Millstone No. 2 LER 80-05/IT-0 dated March 21, 1980, C.E. letter to Florida Power & Light Company, and various C.E. internal memos.

## 3. Findings

- a. C.E. became aware of this situation via correspondence from Northeast Utilities in February of this year. Millstone 2 performs some maintenance in Mode 5 with the RCS partially drained. Reportedly, this is inconsistent with C.E.'s interpretation of allowed operational conditions in that mode and the assumption of a full RCS (except for the pressurizer) used in all analyses for the plant from the time the FSAR was prepared.
- b. It was found that this situation could exist in other St. Lucie 1 type plants, i.e. Calvert Cliffs 1 & 2, Fort Calhoun, and Millstone 2.
- c. The affected Licensees were notified of this possible condition and provided with modified plant conditions that would permit these actions without compromising the boron dilution analysis, i.e. increase the shutdown margin from 1% to 2%, preclude operation with all three (3) charging pumps on at one time, or specify surveillance requirements on the monitoring of the boron concentration which is a function of the number of charging pumps running.
- d. The inspector concluded that a proper evaluation had been made and that reporting requirements had been met.

## E. Compliance with 10 CFR Part 21

### 1. Inspection Objective

To determine whether Combustion Engineering and appropriate responsible officers had established and implemented procedures and other instructions as required to ensure compliance with 10 CFR Part 21 requirements relative to the reporting of defects. Inspector determinations are based on the requirements of 10 CFR Part 21 as clarified by USNRC staff positions in NUREG-0302, Revision 1.

## 2. Method of Accomplishment

The preceding objectives were accomplished by an examination of applicable procedures and the following Field Action Requests (FAR) and supporting documentation:

### a. Steam Dump Valve Failure

This item (FAR 6370-357) was identified by ANO-Unit 2 and involved the operation and subsequent failure of an atmospheric steam dump valve and a condenser steam dump valve manufactured by Copes Vulcan Inc. The failure of these valves was valve operator damage which resulted in the valves becoming inoperative. The failure was determined to be caused by flow and differential pressure induced forces due to valve trim design. The valve trim design used was unique to ANO-Unit 2. These valves are 2 of 7 valves purchased for ANO-Unit 2 on P.O. 9203753.

FAR Supplements A, B, C, D, E, & F describe the modifications, testing and failures of the steam dump valves that have occurred since the initial failures. The final resolution is still pending.

### b. Miniflow Orifices - Low Pressure Safety Injection (LPSI) and Containment Spray (CS) Pumps

C.E. had determined that the existing miniflow bypass orifices for the LPSI and CS pumps will provide an unacceptable excessive head loss. The size of the orifice was established by the supplier, Ingersoll-Rand Company, reportedly based on shut off head and not on C.E. supplied data. (This item was identified on FARs 14273-90 & -91, 14373-22 & -23, and 14H73-05 & -06). The corrective action was to increase the orifice size from .62 to .75 inches for the LPSI pumps and from .69 to .88 for the CS pumps. The safety significance of the undersized orifices could not be assessed by C.E. engineering personnel therefore it could not be determined that reporting requirements were followed. This discrepancy was found to exist on Palo Verde 1, 2, & 3, and WPPSS 3 & 5 and the licensees were advised.

### c. Low Excore Subchannel Readings

The Channel D excore subchannels at Arkansas Nuclear One - Unit 2 (FAR 6370-502) showed lower than expected readings at all power levels. Gain adjustments failed to increase the readings enough to make them consistent with the readings of similar channels. The conclusion of the C.E. analysis of this condition was that the channel still remains within the range expected from uncertainty analysis. This item is unique to ANO-2.

d. Control Position Isolation Assembly Buffer  
Amplifier Card Failure

The Position Isolation Assembly failed in service at ANO-2 (FAR 6370-486). The board was tested and found to operate properly at room temperature; however, upon retesting at an elevated temperature of 140°F (5°F above Specification 00000-ICE-3009 requirements) channels 1 & 2 drifted higher. The problem was traced to capacitors that were considered thermally sensitive, causing an unstable output. The defective components were replaced and the board retested satisfactorily at high and ambient temperatures. Records indicated that there were no other similar failures reported, therefore this failure is considered an isolated case unique to ANO-2.

3. Findings

- a. There were no items of noncompliance, deviations, or unresolved items identified.
- b. The examination of the above identified FARs and their supporting documentation did not reveal any instance of insufficient documentation or failure to meet NRC reporting requirements. However, to obtain a complete picture of each deficiency, one must obtain records from many sources within C.E. resulting in many delays. A central file of FAR documentation is highly desirable.

F. Exit Interview

An exit interview was held with management representatives on December 11, 1980. Those in attendance were:

- L. B. Dungan, Senior Engineer, Engineering Quality Assurance (EQA).
- T. C. Ennaco, Licensing Engineer
- P. D. Ford, Supervisor, Group Quality Systems (GQS)
- C. W. Hoffman, Director, Group Quality Assurance (GQA)
- G. J. Huba, Manager, EQA
- T. R. Swift, Manager GQS

The inspector summarized the scope and findings of the inspection. Management Comments were generally for clarification only, or acknowledgement of the statements by the inspector.