

U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. EC 86-05
Docket No. 50-271
License No. DPR-28
Licensee: Vermont Yankee Nuclear Power Corporation
RD 5, Box 169, Ferry Road
Brattleboro, Vermont 05301

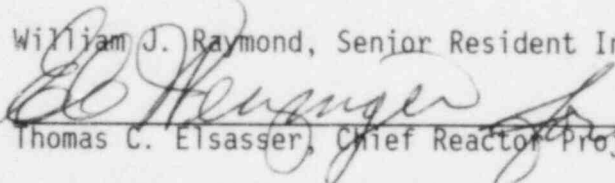
Facility Name: Vermont Yankee Nuclear Power Station

Type of Meeting: Enforcement Conference

Meeting At: NRC Region I, King of Prussia, Pennsylvania

Meeting Date: March 19, 1986

Prepared By: William J. Raymond, Senior Resident Inspector

Approved by: 
Thomas C. Elsasser, Chief Reactor Projects Section 3C

4/14/86
Date

Meeting Summary: An Enforcement Conference was held at NRC Region I, King of Prussia, Pennsylvania, on March 19, 1986 to discuss the findings of Special Inspection No. 50-271/86-05. That inspection was conducted to review the failure of the Standby Liquid Control (SLC) system during a test on February 8, 1986, and to identify the factors that caused the SLC to be inoperable from July 11, 1984 until February 8, 1986. Operation of the reactor for core operating Cycle XI was in violation of Technical Specification 3.4.A. The meeting was attended by NRC and licensee management and lasted about two hours, during which the circumstances associated with the event and the licensee's proposed corrective actions were discussed.

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DETAILS

1. Meeting Attendees

a. Vermont Yankee Nuclear Power Corporation

D. McElwee, Senior Engineer - Operations Support
W. Murphy, Vice President and Manager of Operations
R. Wanczyk, Technical Services Superintendent

b. Nuclear Regulatory Commission

J. Allan, Deputy Regional Administrator
T. Elsasser, Chief, Reactor Projects Section 3C
P. Eselgroth, Chief, Test Programs Section
D. Holody, Enforcement Specialist
W. Kane, Deputy Director, Division of Reactor Projects
W. Raymond, Senior Resident Inspector
R. Starostecki, Director, Division of Reactor Projects
L. Tripp, Chief, Reactor Projects Section 3A
E. Wenzinger, Chief, Reactor Projects Branch 3

2. Summary of Discussion

Mr. Starostecki opened the meeting and participants were introduced. Mr. Starostecki summarized the event as described in Inspection Report 86-05 and requested Vermont Yankee representatives to address NRC concerns associated with the inoperable Standby Liquid Control System (SLC), including: how the system became inoperable; the apparent loss of configuration control following a design change on the SLC system; and, the deficiencies in the procurement and pre-service testing programs which did not detect a vendor product change that affected the operability of a safety system.

Following opening remarks by Mr. Murphy, Mr. Wanczyk and Mr. McElwee gave a presentation that summarized the sequence of plant actions associated with the event, the licensee comments on the Inspection Report 86-05, and the corrective actions taken and planned to prevent recurrence. The summary of licensee actions covered the period from February 8-18, 1986, and included the sequence of plant activities following the failure of the 14A SLC squib valve to fire during testing per OP 4114 on February 8, 1986. Management involvement in the review of the event was evident. Licensee actions to provide timely notifications to the NRC and other users of potentially defective vendor parts were also evident.

The licensee provided comments in three areas of Inspection Report 86-05, regarding statements that could be potentially misleading. The Summary section of the report (page 1) noted that the as-found firing circuit wiring differed from the wiring design drawing. Further, on page 2 of the report, the NRC staff noted that the as-found wiring in the local terminal boxes appeared "rolled" into a sequence different than that depicted by control wiring draw-

ings (CWDs) B191301 Sheets 1200 and 1201. The licensee stated that the as-found wiring was functionally the same as the design specified by SIL 186, and further, that the sequence of the wires shown on the CWD was not pertinent to the functional design basis of the circuit, but only provided for clarity in depicting the circuit terminations. The licensee stated further that the SIL design basis was not to make a circuit that would be acceptable for a primer chamber of a type different than that installed during the modifications in 1977.

The NRC staff agreed that implementation of the 1977 modifications resulted in a circuit that was functionally correct per the SIL design. However, field changes to the circuit as described in the installation procedure were made which were not properly documented. The NRC staff maintained that the failure to properly document the 1977 field changes constituted a loss of licensee control over the wiring configuration, since the CWDs are the only controlled drawings provided to depict the electrical configuration of station electrical circuits, and are used by plant personnel as both electrical schematics and wiring diagrams. The NRC staff agreed, as stated in the report, that had the field changes been properly documented in 1977, they would have been approved. Thus, the causes for the SLC system failure remained the primer manufacturing error, and the failure by the manufacturer and the licensee to detect the error prior to use of the primer chambers. Additionally, it also remains true that had the firing circuit field modification not been made, the improperly manufactured primers would have fired the squib valves and allowed the SLC to function as designed.

The licensee commented further on a statement made on page 6 of the report concerning the actions by an Instrument & Control technician while working on the SLC firing circuits in 1983. The licensee stated that the technician did not recognize a discrepancy between the as-found circuits and the CWDs in 1983, but only noted that the wiring color coding was not carried through the local terminal boxes. The NRC staff acknowledged the licensee's comments and noted that the clarification had no bearing on the outcome on the staff enforcement action for the issue.

The licensee suggested that the NRC staff reconsider the information provided to the industry in Information Notice 86-13 dated 2/21/86 which described the SLC failure at VY. The licensee noted that information in the notice attributed the failure to wiring errors both internal and external to the primer chambers, when in fact, the primer wiring error alone could cause a problem at another facility. The NRC staff stated that this information would be reviewed and the need to reissue information on this subject would be reconsidered.

The licensee summarized the scope and status of corrective actions that have or will be taken to prevent a recurrence of the event, which included the actions summarized below.

- (1) Revise procedure OP 4203 to: include a pin-to-pin continuity check of new primer chambers prior to installation in the firing circuits; change the method of test firing the primers in the circuit, such that the in-

situ testing will be on a primer from a batch to be used for the upcoming operating cycle; and, address additional precautions regarding the proper handling of the explosive charges. The revised procedure is expected to be issued by April 17, 1986.

- (2) Update and correct CWD drawings B191301 Sheets 1200 and 1201. The drawing changes were initiated on March 17, 1986. Additionally, the licensee will review drawings for control room panel 9-5 to identify and make needed clarifications.
- (3) Procedure changes will be made to enhance procurement controls and specifically to require that drawings will be requested and reviewed by plant personnel for subsequent orders of the parts. The existing primer chambers in stores will be clearly marked to assure shelf life limits are observed and out-of-date charges will be disposed. Additionally, by memo dated March 17, 1986, Yankee NSD was requested to reevaluate the primer chamber vendor's QA program and to make recommendations by April 17, 1986 regarding subsequent orders from the vendor.
- (4) In the area of design control, the licensee will complete a review by April 17, 1986 to assure that present procedures assure that as-built drawings are completed as part of the design change process. Maintenance request 86-0524 has been initiated to arrange the primer pigtail wiring to reflect the sequence specified by the CWD, and thereby make the circuit wiring compatible with either type of primer chamber. Additionally, surveillance procedures will be reviewed by April 17, 1986 to identify any other tests which provide an after-the-fact operability demonstration of the tested system. The as-built circuit configuration will be verified for any test so identified. The Traversing Incore Probes (TIP) were the only systems identified as of March 19, 1986 that required additional review.
- (5) Additional tests and checks will be completed using an upgraded version of OP 4203 prior to declaring the SLC system operable. This will include a continuity check of all charges withdrawn from stores, and in-situ test firing of one charge from the batch to be used.
- (6) The licensee will complete an evaluation by April 17, 1986 to determine whether design changes to the squib continuity monitoring circuit would be warranted to make it foolproof. The licensee's preliminary assessment for this item is that such a monitoring circuit would not be cost effective, and the existing design is sufficient so long as configuration controls are maintained.
- (7) The licensee agreed to consider whether the SLC technical specifications (3/4.4) should be revised to better define the intended surveillance test requirements.

3. Conclusion of Meeting

Mr. Murphy summarized the licensee's presentation by making the following points: (i) the SLC system was inoperable for 1 operating cycle; (ii) the cause for the SLC being inoperable was the manufacturing error in the primer chambers, as substantiated by the vendor's Part 21 report; (iii) the system design and testing procedures in place since 1977 were adequate to assure an operable system, except that the procedure for bench testing the charges could have been more detailed and the in-situ testing could have been better; (iv) the loss of configuration control did not contribute to the loss of operability, but did create an inadequacy in the documentation; and, the plant's followup actions were timely and comprehensive.

Mr. Starostecki concluded the meeting by stating the Region I staff would evaluate the licensee's corrective actions and that a decision regarding the appropriate enforcement action would be forthcoming.