



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

GENERIC LETTER 83-28, ITEMS 3.1.1, 3.1.2, 3.2.1, 3.2.2, 4.1 AND 4.5.1

DUQUESNE LIGHT COMPANY

BEAVER VALLEY POWER STATION, UNIT 1

DOCKET NO. 50-334

1.0 Introduction

On February 25, 1983, both of the scram circuit breakers at Unit 1 of the Salem Nuclear Power Plant failed to open upon an automatic reactor trip signal from the reactor protection system. This incident occurred during plant startup, and the reactor was tripped manually by the operator about 30 seconds after the initiation of the automatic trip signal. The failure of the circuit breakers has been determined to be related to the sticking of the undervoltage trip attachment. Prior to this incident, on February 22, 1983, at Unit 1 of the Salem Nuclear Power Plant, an automatic trip signal was generated based on steam generator low-low level during plant startup. In this case, the reactor was tripped manually by the operator almost coincidentally with the automatic trip.

Following these incidents, on February 28, 1983, the NRC Executive Director for Operations (EDO), directed the staff to investigate and report on the generic implications of these occurrences at Unit 1 of the Salem Nuclear Power Plant. The results of the staff's inquiry into the generic implications of the Salem unit incidents are reported in NUREG-1000, "Generic Implications of ATWS Events at the Salem Nuclear Power Plant." As a result of this investigation, the Director, Division of Licensing, Office of Nuclear Reactor Regulation requested (by Generic Letter 83-28 dated July 8, 1983) all licensees of operating reactors, applicants for an operating license, and holders of construction permits to respond to certain generic concerns. These concerns are categorized into four areas: (1) Post-Trip Review, (2) Equipment Classification and Vendor Interface, (3) Post-Maintenance Testing, and (4) Reactor Trip System (RTS) Reliability Improvements. Within each of these areas various specific actions were delineated.

This safety evaluation (SE) addresses the following actions of Generic Letter 83-28:

- 3.1.1 and 3.1.2, Post Maintenance Testing (Reactor Trip System Components)
- 3.2.1 and 3.2.2, Post Maintenance Testing (All Other Safety-Related Components)

- 4.1, Reactor Trip System Reliability (Vendor-Related Modifications)
- 4.5.1, Reactor Trip System Reliability (System Functional Testing)

By letters dated November 4, 1983, and February 1, 1984, Duquesne Light Company (DLC or the licensee) described their planned or completed actions regarding the above items for Beaver Valley Power Station Unit 1 (BVPS-1).

2.0 Evaluation

2.1 General

Generic Letter 83-28 included various NRC staff positions regarding the specific actions to be taken by operating reactor licensees and operating license applicants. The Generic Letter 83-28 positions and discussions of licensee compliance regarding Actions 3.1.1, 3.1.2, 3.2.1, 3.2.2, 4.1 and 4.5.1 for BVPS-1 are presented in the sections that follow.

2.2 Actions 3.1.1 and 3.1.2, Post-Maintenance Testing (Reactor Trip System Components)

Position

Licensees and applicants shall submit the results of their review of test and maintenance procedures and Technical Specifications to assure that post-maintenance operability testing of safety-related components in the reactor trip system (RTS) is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety functions before being returned to service.

Licensees and applicants shall submit the results of their check of vendor and engineering recommendations (regarding safety-related components in the RTS) to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications, where required.

Discussion

The requirements for post-maintenance testing of all safety-related equipment (including RTS components) are not specifically identified in the test and maintenance procedures. The licensee gave no indication that a review of individual test and maintenance procedures had been initiated.

The licensee, however, outlined their current administrative procedures requiring the review of post-maintenance testing requirements. All safety-related maintenance at BVPS-1 is performed under a maintenance work request (MWR). Site Administrative Procedures (SAPs) require the Operations Group to

review all MWRs prior to the initiation of work and again following the completion of work to determine what, if any, post-maintenance testing is required.

Since all safety-related work is required to be performed under an MWR, there is a high assurance that post-maintenance testing requirements will be reviewed by the operations department and will verify that each component will perform its intended safety function before being returned to service.

The licensee reviewed approximately 279 Westinghouse Technical Bulletins and Data Letters for their applicability to the BVPS-1 reactor trip system. This initial review identified 77 potential open items that required further investigation. The licensee created a Task Force to evaluate all items opened by the review of vendor-supplied technical bulletins. The most recent Task Force update, dated December 11, 1984, indicated that two items previously identified in their review of RTS components (NSD-TB-80-04 and NSD-TB-82-03R1) have been evaluated, incorporated into appropriate technical equipment manuals, and are awaiting final administrative closeout.

Based on the above, the licensee has complied with the NRC staff position for Actions 3.1.1 and 3.1.2 of Generic Letter 83-28.

2.3 Actions 3.2.1 and 3.2.2, Post-Maintenance Testing (All Other Safety Related Components)

Position

Licensees and applicants shall submit a report documenting the extending of test and maintenance procedures and Technical Specifications review to assure that post-maintenance operability testing of all safety-related equipment is required to be conducted and that the testing demonstrates that the equipment is capable of performing its safety functions before being returned to service.

Licensees and applicants shall submit the results of their check of vendor and engineering recommendations (all other safety-related components) to ensure that any appropriate test guidance is included in the test and maintenance procedures or the Technical Specifications, where required.

Discussion

The licensee reviewed vendor technical manuals for key safety-related pumps, valves, motors, breakers, batteries, battery chargers, and diesel generators. The licensee determined that post-maintenance test guidance provided in the technical manuals for these systems has been included in the plant test and maintenance procedures.

Based on the above, and the post-maintenance test method described in Section 2.2, the licensee has complied with the NRC staff position for Actions 3.2.1 and 3.2.2 of Generic Letter 83-28.

2.4 Action 4.1, Reactor Trip System Reliability (Vendor-Related Modifications)

Position

All vendor-recommended reactor trip breaker modifications shall be reviewed to verify that either: (1) each modification has, in fact, been implemented; or (2) a written evaluation of the technical reasons for not implementing a modification exists.

For example, the modifications recommended by Westinghouse in NCD-Elec-18 for the DB-50 breakers and a March 31, 1983, letter for the DS-416 breakers shall be implemented or a justification for not implementing shall be made available. Modifications not previously made shall be incorporated or a written evaluation shall be provided.

Discussion

The licensee reviewed past Westinghouse-supplied technical bulletins, the Westinghouse Technical Manual for reactor trip breakers, and Westinghouse input for utility response to NRC Generic Letter 83-28 for applicable reactor trip breaker modifications. One modification was determined applicable to their DB-50 breakers (DLW-83-581) as follows:

The overcurrent trip brackets were removed from the trip bar to provide an additional margin on the trip interaction of the undervoltage trip attachment. This modification was implemented during the third refueling outage.

Based on the above, the licensee has complied with NRC staff position for Action 4.1 of Generic Letter 83-28.

2.5 Action 4.5.1, Reactor Trip System Reliability (System Functional Testing)

Position

On-line functional testing of the reactor trip system, including independent testing of the diverse trip features, shall be performed on all plants. The diverse trip features to be tested include the breaker undervoltage and shunt trip features on Westinghouse, B&W and CE plants; the circuitry used for power interruption with the silicon controlled rectifiers on B&W plants; and the scram pilot valve and backup scram valves (including all initiating circuitry) on GE plants.

Discussion

The licensee independently tests the undervoltage trip attachment of the reactor trip breakers (RTBs) on a bimonthly basis. Their current RTB design does not allow the shunt trip attachment to be independently tested without tripping the reactor.

The licensee plans to implement an automatic shunt trip modification during the fifth refueling outage (Spring 1986) which will allow both the undervoltage coil and the shunt trip attachment to be independently tested while the plant is in operation.

Based on the above the licensee has complied with NRC staff positions for Action 4.5.1 of Generic Letter 83-28.

3.0 Conclusion

Based upon the foregoing discussions, we conclude that the licensee is in compliance with the guidelines for Actions 3.1.1, 3.1.2, 3.2.1, 3.2.2, 4.1, and 4.5.1 of Generic Letter 83-28.

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