

DCS NOS. 50309-830405

U.S. NUCLEAR REGULATORY COMMISSION
Region I

Report No. 50-309/83-05

Docket No. 50-309

License No. DPR-36 Priority -- Category C

Licensee: Maine Yankee Atomic Power Company
83 Edison Drive
Augusta, Maine 04336

Facility Name: Maine Yankee Nuclear Power Station

Inspection at: Wiscasset, Maine

Inspection conducted: April 6 - 7, 1983

Inspectors: *E. M. Kelly For* *4/13/83*
P. Swetland, Reactor Inspector Date signed

Approved by: *Robert M. Gallo* *4/14/83*
R. Gallo, Chief, Reactor Projects Date signed
Section No. 1A, DPRP

Inspection Summary:

Inspection on April 6 - 7, 1983 (Report No. 50-309/83-05)

Areas Inspected: Special safety inspection to review the circumstances regarding the inoperability of a high pressure safety injection pump identified by the licensee on April 5, 1983. The inspection involved 8 hours by the senior resident inspector.

Results: Two apparent violations were identified: (1) Inadequate control of safety-related maintenance and (2) Failure to maintain two operable safety injection trains in accordance with Technical Specification 3.6. (Detail 2.b).

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DETAILS

1. Persons Contacted

- *R. Arsenault, Operations Department Head
- R. Forrest, Maintenance Section Head
- R. Nelson, Nuclear Safety Engineer
- *D. Stevenson, Plant Shift Superintendent
- K. Vachon, Electrical Maintenance Supervisor
- *E. Wood, Plant Manager

The inspectors also interviewed several plant operators, technicians and members of the engineering and maintenance staffs.

*denotes those present at exit interview.

2. Followup of a High Pressure Safety Injection Pump Failure on April 5, 1983

a. Description of the Event

During routine monthly surveillance of safeguards systems on April 5, 1983, the spare high pressure safety injection pump (HPSI S) failed to operate. Licensee investigation into the cause of this failure indicated that a "grounding truck" installed in place of the A train HPSI pump breaker (in the 4160 volt switch gear cabinet) actuated an interlock switch which prevented operation of the HPSI S pump. The HPSI S pump had been operated as the A train HPSI pump since December 1982. The ground truck had been installed on March 7, 1983 as part of a tagout for overhaul of the HPSI A pump motor. The inspector reviewed the licensee actions leading to and recovering from this occurrence. The following pertinent information was identified:

- On January 21, 1983 a maintenance request (MR) was generated for overhaul of the HPSI A pump motor. This pump had been inoperable since November 1982, requiring the HPSI S pump to be used as the A train pump. The MR (#222-83) was written and reviewed in accordance with procedure 0-07-3, Maintenance Requests, Revision 0. The motor overhaul was judged to be within the skills of the qualified maintenance personnel and therefore no job-specific maintenance procedure was used. The plant Routine Corrective Maintenance procedure, 5-38-2, Revision 5 provides instructions for general maintenance of this nature. No special instructions regarding the potential safety aspects of grounding this pump with the standard ground truck were detailed for this job. The MR and work procedure were reviewed by engineering and quality assurance personnel prior to starting the work.

- The HPSI S pump was last operated satisfactorily on March 3, 1983 during routine surveillance testing, in accordance with procedure 3.1.2, Emergency Core Cooling System (ECCS) Routine Testing, Revision 23. Following this test the pump was placed in standby as the A train HPSI pump. The B train HPSI pump was operating as the reactor coolant charging pump and the B train HPSI pump from March 3 - April 5, 1983.
- In order to prevent operating two HPSI pumps from the same distribution bus, the spare pump is prevented from starting when the A or B train HPSI pump breaker is racked-up in the same distribution bus as the applicable HPSI S pump breaker. This interlock is accomplished by limit switches (52HL) which actuate when either the A or B pump breaker elevator is in the raised position. The installation of a "grounding truck" in the distribution bus cubicle requires raising the elevator and therefore actuates this interlock. Based on interviews with licensed operators, the existence and purpose of the interlock was discussed during the licensee's operator training program. However, no lesson plans that dealt with the interlock were available nor was this feature described in the Maine Yankee System Description Manual. Furthermore, it appears that neither the operator nor the maintenance training programs address the effect of the "grounding truck" operation on the 52HL interlock. A warning is stenciled on the breaker cabinet door which cautions against leaving the grounding truck in the breaker cubicle.
- On March 7, 1983 at the request of maintenance personnel, plant operators tagged out the HPSI A pump which was out of service at that time (tag #1266-83). The pump motor was grounded in accordance with maintenance procedure 5-3-1, Grounding of Electrical Equipment, Revision 3. In this process a grounding truck was installed in the HPSI A pump breaker in the 4160 volt distribution cabinet. When the grounding truck was raised into the A pump breaker position, the 52HL switch precluded operation of the HPSI S pump. Neither the operators nor plant maintenance personnel recognized the effect of this action on plant safety systems.
- At 1:40 p.m. on April 5, 1983 the licensee identified the inoperability of the HPSI S pump during monthly ECCS testing. Since Technical Specification 3.6 requires two operable HPSI subsystems, the plant operators entered a remedial action (action statement) which allows continued operation for 72 hours with one HPSI subsystem (train) inoperable, provided the redundant HPSI train is operable and the emergency diesel generator (DG) which supplies this redundant train is tested within 2 hours. The licensee notified the NRC resident inspector of the degraded safety system. DG-1B was tested at 3:40 p.m. April 5, 1983.

- At 4:00 p.m. April 5, the licensee discovered the cause of the HPSI S pump failure. The grounding truck was removed and the pump was placed in operation as a charging pump at 4:25 p.m. A pump performance test was completed satisfactorily. The NRC resident inspector was informed of the return to full HPSI system capability, and of the protracted nature of the subsystem inoperability.
- During a review of plant records, the inspector determined that DG-1B had been out of service for maintenance from 8:30 A.M. - 3:15 p.m. on March 17, 1983. Assuming the loss of offsite power associated with Plant Safety Analyses the licensee would have had no HPSI system to mitigate the consequences of an accident during this period.
- On April 6, 1983, the Onsite Review Committee (PORC) reviewed the licensee's actions with regard to this event. Recommended corrective actions were outlined and a committee to develop and implement these actions was formed. The following corrective actions were approved:

Short Term

- (1) In the future, if a spare pump is in service in place of another A-B-S combination pump, the breaker elevator for the replaced pump will be tagged and locked to prevent the inadvertent actuation of the 52HL interlock. The tagout requires the 52HL contact to be jumpered (requiring a written safety evaluation) prior to raising the elevator.
- (2) Operations Procedures 3-1-2, 3-1-2a and 1-11-6 will be revised to insure that whenever pump lineups are changed, the tags referred to above will be properly installed.
- (3) Procedure 5-3-1, Grounding, will be revised to address the effects of the 52HL interlock.
- (4) A memorandum to all operations department personnel describing the event and corrective actions will be issued.

Long Term

- (1) The licensee will investigate permanent modifications to prevent the recurrence of this event.
- (2) Plant training will be reviewed and augmented to insure that personnel are trained in the details of electrical systems as necessary to prevent a similar occurrence.

The inspector reviewed the implementation of short term recommendations including: (1) installation of tags (serial #1402-83) on HPSI pump breakers (no other spare pumps were in service), (2) Procedure change requests implementing the specified tag-out and jumper requirements, and (3) Operations Memorandum 9-E-8, written on April 7, 1983, distributed as required reading for all plant operators.

b. Findings

Although the maintenance performed on the HPSI A pump was controlled in accordance with existing plant procedures, these procedures and the personnel who administered them failed to recognize and control the safety-related aspects of the 52HL interlock. Consequently an emergency core cooling pump was rendered inoperable without the licensee's knowledge and remained inoperable for about 29 days. Because the licensee was unaware of the HPSI system degradation, maintenance was permitted on the redundant HPSI system emergency diesel generator on March 17. For a period of about seven hours there would have been no operable HPSI system to mitigate the consequences of an accident in which offsite power supplies were lost.

10 CFR 50 Appendix B, Criteria II and V, require personnel training and written procedures which are adequate to insure the correct accomplishment of safety-related activities. The licensee's personnel training and procedures were inadequate in that they failed to control the interlock associated with the spare HPSI pump. This failure resulted in a significant degradation of plant safety systems. This is a violation. (309/83-05-01)

Technical Specification 3.6 requires two operable ECCS subsystems whenever the plant is at power. A 72 hour grace period is provided in which one subsystem (train) may be inoperable. During this event one train was inoperable for 29 days because the HPSI S pump was inoperable and the second train was coincidentally inoperable for seven hours due to the inoperability of the emergency power supply. This is a violation. (309/83-05-02)

3. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on April 7, 1983. The purpose, scope and findings of the inspection were summarized.