

YANKEE ATOMIC ELECTRIC COMPANY
YANKEE NUCLEAR POWER STATION
ANNUAL REPORT
1981

Prepared by:

Yankee Atomic Electric Company
Technical Services Department

Star Route
Rowe, Massachusetts 01367

1981 ANNUAL REPORT

TABLE OF CONTENTS

<u>TITLE</u>	<u>PAGE</u>
Title Page -----	i
Table of Contents -----	ii
Introduction -----	1
Changes	
A. Engineering Design Changes -----	2
B. Plant Design Changes -----	4
C. Plant Alterations -----	7
Tests -----	8
Experiments -----	8
Safety and Relief Valve Failures and Challenges-----	8

INTRODUCTION

The Yankee Nuclear Power Station is a Pressurized Water Reactor (PWR) of 175 MW electrical, maximum dependable capacity (MDC). The nuclear steam supply system is a Westinghouse 4 loop reactor. The architect/engineer and constructor for this project was Stone & Webster Engineering Corporation, Boston. The condenser cooling is once through using the Deerfield River as a cooling medium. The plant is operated in accordance with License DPR-3, issued July 19, 1960, pursuant to Docket Number 50-19. The date of initial reactor criticality was August 19, 1960 and commercial operation began July 1, 1961.

This annual report is submitted in accordance with Technical Specification 6.9.2. Those portions of this report concerning changes, tests and experiments are submitted in accordance with 10 CFR 50.59(b).

CHANGES

- A. Engineering Design Change. The following is a summary of those fully approved Engineering Design Changes that were implemented during 1981.

EDC 79-13, Fire Detection System

In order to provide a significant improvement in fire detection capabilities a Pyrotronics System 3 Universal Alarm Control System was installed throughout the plant. This change was made in response to the Fire Protection Safety Evaluation Report from the USNRC. This change was made to improve plant safety and therefore poses no unreviewed safety question.

EDC 79-16, Emergency Feedwater System Upgrade

Two motor driven 150 gpm emergency feedwater pumps and associated piping and instrumentation were installed to improve plant capability to meet a loss of feedwater condition. Based on design considerations and function there is no unreviewed safety question.

EDC 79-17, Automation of Main Steam Non-Return Valves

Quick closing stored energy actuators were installed on the four main steam line non-return valves in order to improve the plant's ability to mitigate a main steam line break downstream of the NRV's. Instrumentation installed provides a 2-out-of-3 trip logic to automatically shut the valves. Main Coolant pressure channels and logic installed remove the trip signal on decreasing pressure to allow plant shutdown without a trip. An enclosure for the actuators was fabricated to maintain ambient temperature within manufacturers specifications. The actuators were determined to be reliable and able to reduce the severity of transients imposed on the main coolant in the event of a main steam line break and therefore do not pose an unreviewed safety question.

EDC 79-22, Modifications and Additions to The Yankee Rowe Fire Protection System

Extensive modifications were made to the fire protection system to comply with the NRC's Fire Protection Safety Evaluation Report dated March 15, 1979. The implementation of the modifications and additions to the fire protection systems increases the capability to detect fires and prevent or lessen the damage caused by fires. Based on the above the changes pose no unreviewed safety question.

EDC 79-24, Fire Pump and Water Supply Modification

A 2000 gpm diesel driven fire pump, 350,000 gallon tank, and associated piping, instrumentation and auxiliary equipment were installed to increase the capacity and redundancy of the fire protection system. Based on the increase in system reliability there is no unreviewed safety question.

EDC 79-34, Control Room Shield Wall

A 12-inch thick concrete wall was constructed between the Control Room and Turbine Hall to reduce control room radiation levels during an accident. Based on the increase to personnel safety the change does not pose an unreviewed safety question.

EDC 79-40, Vapor Container Level/Pressure Monitors

Instrumentation was installed to monitor the vapor container drain tank (VCDT) and containment level and containment pressure. A narrow range detector was installed on the VCDT to detect small amounts of leakage inside the containment. A wide range level detector was installed to monitor containment level in the event of an accident. Pressure instrumentation was installed to monitor containment pressure. All the readings and alarms associated with the system are provided to the control room operators. The equipment installed does not degrade the containment boundary and the instrumentation provides additional information for assessment of plant conditions and therefore does not constitute an unreviewed safety question.

EDC 79-48, Demineralized Water Tank Level Indication

An electronic level transmitter with indication in the control room was installed on the demineralized water tank. This change provided redundant level indications and alarm in the control room. Based on the improvement to plant instrumentation and equipment qualification there was no unreviewed safety question.

EDC 80-14, Fire/Smoke Damper Additions To Existing Ventilation Systems

Fire dampers with fire ratings equivalent to that of the fire barrier penetrated were installed to isolate the control room and switchgear room from the turbine hall. Since the modification increases the capability of the plant to prevent or lessen the damage caused by fire there is no unreviewed safety question.

EDC 81-09, Condensate Pump Trip

In response to the concerns of I&E Bulletin 80-04, trip circuitry was installed for the condensate pumps. The condensate pumps will trip on a coincident high vapor containment pressure and low main steam line pressure. The change was made to provide overpressure protection for the vapor container in the event of a steam line break inside containment. A bypass was installed to allow override of a spurious trip signal. The change does not interfere with normal operation of the pumps and therefore does not pose an unreviewed safety question.

EDC 81-14, D.C. Distribution Panels

Three new dc distribution panels were installed to increase the circuit breaker capacity and accommodate the addition of new dc loads. Based on the qualification of the panels there is no unreviewed safety question.

- B. Plant Design Changes: The following is a summary of those fully approved Plant Design Changes implemented during 1981.

PDC 78-14, Add Flanges to Shutdown Cooling Relief Valves SV-204 and SV-205

In order to effectively test the shutdown cooling safety valve setpoints, flanges were installed on the inlet and outlet of the valves. Isolation valves and drain valves were installed on the discharge piping to allow removal of the safety valves for testing and maintenance. Based on the improvement in system design there is no unreviewed safety question.

PDC 78-17, Penetration Fire Barriers Seals

Penetration seals were provided in the Control Room, Switchgear Room, Heating Boiler Room, PAB, Cable Tray House and Diesel Generator Building to meet Appendix A of Branch Technical Position 9.5.1. The change increases the reliability of the plants fire protection system and therefore does not pose an unreviewed safety question.

PDC 79-3 - (Rev. 1) - Rewiring of Battery Charger No. 3 DC Output Breaker

The DC breaker was rewired in order to have the ability to completely isolate the No. 3 battery charger without de-energizing the No. 3 Battery Distribution Switchboard. Based on the improved ability to isolate the charger for maintenance there was no unreviewed safety question.

PDC 79-4 - MC Pressure, Pressurizer Pressure and Loop Fill Pressure Transmitter Replacement.

The main coolant pressure, pressurizer pressure and loop fill pressure transmitters were replaced and relocated. Instrumentation and piping associated with the transmitters were upgraded. The changes were made to improve reliability by replacing old instrumentation. Based on the above this change does not pose an unreviewed safety question.

PDC 80-05 - Installation of Instrumentation Test/Isolation Valves, For Charging Pump Lube Oil Instruments

Isolation and test valves were added to the charging pump lube oil pressure gauges and switches to allow in-place calibrations and maintenance. The change does not pose an unreviewed safety question in that system operation remains unchanged.

PDC 80-06 - Additional SI Tank Heating Capacity

In order to increase the SI tank temperature to alleviate thermal shock concerns to the reactor vessel during a LOCA changes were made to the Safety Injection Tank and Heating System. The tank was insulated and equipped with "Heat Sheet" steam heating panels. The existing heater and circulator piping was modified to redirect flow for better efficiency. Changes to safety class systems were of a minor nature, and the function of the system was not changed therefore there was no unreviewed safety question.

PDC 80-08 - Replacement of MCB 10F Panalarm

The main control board panalarm 10F was replaced with a split window model to increase alarm capacity. There was no unreviewed safety question since all inputs from safety related instrumentation would, by design, not be affected by internal panalarm failures.

PDC 80-16 - Split of Charging Pump Suction From The Safety Injection Tank and Boric Acid Mix Tank

The charging pump suction header from the safety injection tank and boric acid mix tank, which was common, was changed to an independent configuration. The design change was made to improve system reliability and redundancy and to allow for maintenance. There was no unreviewed safety question based on the above discussion.

PDC 80-18 - Addition of Pressure Gauges to HPSI and LPSI Suction Lines

Pressure gauges were installed on the suction lines of each high pressure and low pressure safety injection pump. The gauges are used to evaluate pump performance during surveillance testing. The gauges are to remain isolated except during surveillance testing and therefore pose no unreviewed safety question.

PDC 80-21 - Spent Fuel Pit Dewatering System Level Switch Replacement

The tubing associated with the level switch was replaced in order to upgrade the spent fuel pit dewatering instrumentation equipment. The carbon steel tubing which was in contact with stagnant borated water was replaced and an unused pressure switch was removed. Test valves were added to the other switch. The change was an upgrade of plant equipment and systems and therefore does not pose an unreviewed safety question.

PDC 80-22 - Addition of Test Valve to SW-LPS-414

A test valve was added to the VC Booster Pump Discharge Pressure Switch to allow calibration of the instrument in place. The addition of the valve will increase the accuracy of calibration and therefore does not pose an unreviewed safety question.

PDC 81-01 - Main Coolant Temperature/T-Average and Delta Temperature

Main coolant temperature instrumentation was replaced. The numerous changes implemented brought the associated instrumentation up to the state of the art and therefore improved plant reliability. Based on the above discussion there was no unreviewed safety question.

PDC 81-04 - Addition of Dual Contactors to SI-MOV-46

Due to revisions to the emergency procedure for loss of main coolant SI-MOV-46 was required to be electrically operable during plant operation. To prevent spurious operation dual contactors and key-locked control switches were added to the motor operated valve circuitry. Based on the above discussion there was no unreviewed safety question.

PDC 81-05 - Repair Fuel Assembly No. B574 and Install
Dummy Pins In New Fuel

Fuel assembly No. B574 was repaired using inert rods. To prevent future damage to new fuel assemblies selected fuel rods were replaced by inert rods. The change did not pose an unreviewed safety question since the inert rods were structurally equivalent to the fuel rods. Physics analysis showed no significant impact to the design analysis for Core XV.

PDC 81-07 - Modifications of The Pressurizer Narrow Range
Transmitter Sensing Lines

The pressurizer narrow range transmitter sensing lines and valves were replaced between the isolation valves and transmitter. The change does not pose an unreviewed safety question since system operation remains the same.

- C. Plant Alterations: The following is a summary of those fully approved Plant Alterations requiring a safety evaluation that were implemented during 1981.

PA 80-15, New RE Office Building

A modular, two story office building was erected in the turbine hall. The building was constructed of fire retardant material. Smoke detectors were installed. The only additional fire loading for the area was office materials within the building. Based on the above there was no unreviewed safety question.

PA 80-26, Motor Operator Turbine Hall Roll-Up Door

A motor operator was installed on the West roll-up door in the North wall of the Turbine Building. This change allows remote operation to facilitate access to the plant by emergency response personnel. This change does not adversely effect any safety related system and therefore poses no unreviewed safety question.

PA 81-07, Addition of Mobile Demineralizer Hook-Ups To
Service and Demineralized Water Lines

A "tee", valves and fire hose fittings were installed on the 2-inch service water line and 1½-inch demineralized water line to facilitate the hook-up of a mobile demineralizer. The change reduces the probability of portable demineralizer equipment freezing during cold weather and therefore improves plant reliability. Based on the above discussion there is no unreviewed safety question.

PA 81-10, Cooling and Venting of The HP Office and The
New Body Count Room and Renovation of The New Body
Count Room

Modifications were made to the office space used by Health Physics personnel and the area used for body counts and respirator fitting. Changes included shielding the body counter and modifying ventilation systems to the office. No changes were made to safety systems and therefore pose no unreviewed safety question.

TESTS

No tests were performed during the report period which are reportable under 10 CFR 50.59.

EXPERIMENTS:

There were no experiments conducted during this report period.

SAFETY AND RELIEF VALVE FAILURES AND CHALLENGES:

During this report period there were no challenges to the pressurizer or steam generator's safety and relief valve, nor were there are failures of those safety and relief valves required to be operable by Technical Specifications. Licensee Event Reports No. 81-06 and 81-15 reported out of tolerance setpoints on three valves.