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June 27, 1991
BECO 91- 082

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

License DPR-35
Docket 50-293

Report of Changes, Test and Experiments
Performed at Pilgrim Nuclear Power Station

In accordance with 10CFR50.59(b), Boston Edison is submitting this report of the changes, tests, and experiments at Pilgrim Nuclear Power Station for the period of January 22, 1990 through December 31, 1990.

A list of changes completed in the reporting period is attached. Each listing contains a brief description of the changes, a reference to the relevant Final Safety Analysis Report (FSAR) section, and a reference to the Safety Evaluation(s) that support each change.

No experiments were performed during the report period.


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MTL/clc/5874

Attachment

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TE47
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Retube Building Modifications

PDC No.: 81-012

SE Nos.: 1116, 1522, 2342

FSAR Reference: 10.8.3.1, Figures 10.8-1, 12.1-1, 12.1-2, 12.1-3, 12.1-4

This plant change modified the Condenser Retube Building for use as a drycleaning, tool decontamination, mask cleaning, instrument calibration and repair facility. The building was provided with HVAC, waste plumbing, hot and cold water systems and fire protection systems.

The Retube Building does not contain any safety related equipment and is not adjacent to any safety related equipment; therefore, this change did not involve an unreviewed safety question.

Low Level Radwaste Compactor Facility

PDC No.: 81-028

SE No.: 1159

FSAR Reference: Figure 12.3-2

This plant change upgraded and compartmentized the low-level solid waste facility and provided a temporary building for the purpose of housing the radwaste compactor within the Machine Shop at El = 23'-0". The radwaste compactor has since been moved to the Trash Compactor Facility.

This change did not involve an unreviewed safety question because it did not affect any normal or emergency operations of any plant system.

Recirculation Pump Oil Level Alarm

PDC No.: 82-025

SE No.: 2016

FSAR Reference: Figure 12.1-6

This plant change was performed in response to General Electric SIL 361 to improve the monitoring capabilities of the recirculation pump motor oil level and vibration alarms.

This plant modification did not involve an unreviewed safety question because this change did not impact or alter the operation of any safety system.

Appendix R Ductwork Construction - New Administration Building

PDC No.: 83-008

SE No.: 1518

FSAR Reference: Figure 12.1-6

This modification involved the construction of the portion of the 10CFR50 Appendix R ductbank which runs under the new Administration/Service building's connecting corridor.

The ductbank did not affect any safety systems; therefore, this modification did not involve an unreviewed safety question.

New Administration Building Blockout and Connection

PDC No.: 83-021

SE No.: 1538

FSAR Reference: 12.2.6, Figures 12.1-6, 12.3-2, 12.3-7

This plant change allowed direct access from the New Administration Building to the plant by removing a section of the Radwaste/Control Building wall and replacing it with a 3 hour rated fire door. This new door does not invalidate the block wall tornado depressurization flow model since it is designed for greater than 3 psid. The section of wall removed and replacement door did not adversely affect the structural properties or missile protection capabilities of the wall. Based on the above, this change did not involve an unreviewed safety question.

Flatbed Filter Modification

PDC No.: 83-026B

SE No.: 1525

FSAR Reference: Figures 9.2-3, 10.11-1

This plant change rebuilt the radwaste flatbed filters, replacing air operated valves, instruments, and filter screens, supports and seals.

The flatbed filters are not safety-related; therefore, this change did not involve an unreviewed safety question.

Condensate, Feedwater, and Reactor Water Sampling and Analysis Improvements

PDC No.: 83-042

SE No.: 2004

FSAR Reference: Table 10.14-1, Figures 3.4-9, 4.3-2, 4.9-2, 10.4-1, 10.5-1, 10.14-1, 11.5-1, 11.7-1, 11.7-2, 11.8-1, 11.9-1, 12.1-6, 12.1-8

This design change involved the removal of the old sample panels C-121 and C-122 and associated chillers and the installation of two new sample racks and chiller units and the replacement of a conductivity recorder in Panel C-1 in the Control Room.

There was an increase in the capability, accuracy and reliability equipment for monitoring plant water chemistry. This change did not involve an unreviewed safety question.

Relocate the Augmented Off Gas Hydrogen Analyzer Gas Bottles

PDC No.: 84-027

SE No.: 1640

FSAR Reference: Figure 12.1-4

This plant change relocated the H₂ gas bottles to reduce the personnel safety hazard involving hand carrying replacement bottles up and down a grating staircase (elevation 51' to elevation 37').

This modification was not nuclear safety-related and did not involve an unreviewed safety question.

Sludge Transfer Pump Replacement

PDC No.: 84-030

SE Nos.: 2368, 1707, 1710

FSAR Reference: 9.3.4.2.1, Figures 9.2-3, 9.3-1 and 10.11-1

High radiation and contamination problems were experienced in the pump room area due to existing centrifugal pumps (P-318A/B) seal leakage. This plant change replaced the existing centrifugal sludge transfer pump (P-318A) with an air driven diaphragm pump, and converted the existing sludge transfer pump (P-318B) installed in 1983 from a temporary modification to a permanent installation.

The sludge transfer line has no safety-related function; therefore, this change did not involve an unreviewed safety question.

Turbine Building Auxiliary Bay Normal Waste Drain Piping

PDC No.: 85-034

SE No.: 1846

FSAR Reference: Figure 9.2-2

This plant change modified the Turbine Building Auxiliary Bay Normal Waste Floor Drain System so that the floor drains discharge to the turbine building floor drain sump instead of the turbine building auxiliary bay sewage ejector tank.

All work performed by this plant change was non-safety related and non-seismic; therefore, an unreviewed safety question did not exist.

TBCCW Slipstream Filter

PDC No.: 85-037

SE No.: 2162

FSAR Reference: 10.6.3, Table 10.6-2, Figures 8.7-1, 10.6-1, 12.1-5

This design change provided a means for continuous cleaning of the demineralizer cooling water in the Turbine Building Closed Cooling Water

(TBCCW) System. A filter was installed in the line that runs from the discharge to the suction of the TBCCW pumps which removes suspended solids from the TBCCW system.

There were no safety-related systems or components affected by this change. This modification had no affect on the Class I floors and walls because the drilling of these structures avoided rebar. This change did not involve an unreviewed safety question.

Replace NA-200 LPRM's with NA-300 LPRM's

PDC No.: 86-021

SE No.: 2033

FSAR Reference: 7.5.6.2.3

This change replaced eight depleted NA-200 LPRM's with NA-300 LPRM's. The new NA-300 MPRM's are identical to the NA-200 LPRM's in their gamma sensitivity, pressure rating, operating temperature and the linearity of the two sensors is the same. However, the NA-300's neutron sensitivity is approximately 50% greater than the NA-200's which will increase the useful lifetime.

The new LPRM's are completely interchangeable with the existing LPRM's in form, fit and function; therefore, this change did not involve an unreviewed safety question.

LPRM Cable Replacement

PDC No.: 86-023A

SE No.: 2037

FSAR Reference: Figure 7.5-14

This change affected the Neutron Monitoring System and replaced existing organic LPRM cable under the Reactor Pressure Vessel with hardline Mineral Insulated cable. Four new junction boxes were seismically mounted outside the RPV pedestal wall intercepting the existing conduit and cable.

Replacement of the LPRM cable assures system functional operation and improved resistance to degrading environments and equipment handling during maintenance activities. This change did not involve an unreviewed safety question.

Backup Nitrogen Supply

PDC No.: 86-053

SE No.: 2317, 2118, 2246, 2169

FSAR Reference: 10.11.3.1, Figures 5.4-1, 10.11-1

This station modification provides additional back-up N₂ supply to critical valves and instruments and to the torus and drywell for containment atmosphere make-up. This modification also replaced the existing instrument air supply

back-up to the drywell with N₂, thus eliminating the potential air/O₂ leakage to containment. Also, AO-4356 was modified to a fail open valve upon loss of AC power or N₂ supply to the valve actuator. This improves the reliability/operability of the drywell instrument N₂ supply system.

The safety functions of the Inerting and Drywell Testing System were not adversely affected by the additional nitrogen backup supplies and associated piping, valves and instruments. The safety functions of the Reactor Building were not adversely affected by the addition of the Reactor Building penetration. The safety functions of the primary containment were not adversely affected by the additional nitrogen backup supplies and associated piping, valves, and instruments.

This change did not involve an unreviewed safety question.

Modifications to the Protected Area Fence

PDC No.: 86-074
SE No.: 2053
FSAR Reference: Appendix P

A description of this change is not provided because it would contain Safeguards Information. The effects of this plant change on FSAR - Appendix P "PNPS Security Plan" have been reported under 10CFR50.54.

Security Perimeter CCTV

PDC No.: 86-077
SE Nos.: 2388, 2196, 2097
FSAR Reference: Appendix P

A description of this change is not provided because it would contain safeguards information. The effects of this plant change on FSAR - Appendix P "PNPS Security Plan" have been reported under 10CFR50.54.

Perimeter Intrusion Detection

PDC No.: 86-078
SE No.: 2075, 2170
FSAR Reference: Appendix P

A description of this change is not provided because it would contain safeguards information. The effects of this plant change on FSAR - Appendix P "PNPS Security Plan" have been reported under 10CFR50.54.

Upgrade of Fire Barrier Penetration Seal

PDC No.: 87-032
SE Nos.: 2283, 2252
FSAR Reference: 10.8.3.3

This plant change resolved fire barrier discrepancies by providing installation instructions to fully upgrade the affected components or by providing reference to Fire Protection Engineering Evaluations which substantiate the present or partially upgraded configuration. The completion of this plant change eliminated the need for fire watches, short term compensatory measures, and provided separation of redundant safe shutdown systems and safety-related equipment in accordance with Technical Specification 3.12 and other Commitments to the NRC.

This modification improved the fire protection capabilities of the plant. This modification had no effect on safety function and therefore did not involve an unreviewed safety questions.

Fire Door Assembly Repairs and Upgrades

PDC No.: 87-068
SE No.: 2251
FSAR Reference: Figure 12.3-1

This plant modification provided additional frame anchor bolts on door frames with insufficient bolting and replaced existing grout caulk to assure the barriers meet a 3 hour fire rating.

This modification did not involve nuclear safety components and therefore did not involve an unreviewed safety question.

Upgrade of the Air Supply to AO-5040A/B, AO-5041A/B, AO-5042A/B and AO-5025

PDC No.: 89-003
SE No.: 2344
FSAR Reference: 5.4.7.2, Figure 10.11-1

This modification was made to provide a more dependable air supply to AO-5040 A/B for long term primary containment isolation. This modification also relocated the air supply for valves AO-5040 A/B, AO-5041 A/B, AO-5042 A/B and AO-5025 from the non-essential instrument air header to the essential instrument air header.

These modifications were made to the non-safety portions of the instrument air system. Because this modification improves the availability and dependability of the valves, an unreviewed safety question did not exist.

Replacement of Neutron Monitoring Bypass Switches

PDC No.: 89-011

SE No.: 2386

FSAR Reference: 7.5.5.4, 7.5.7.4

This modification replaced the existing safety-related Neutron Monitoring bypass switches on Panel 905, "Reactor Control Bench Board," with new safety-related selector switches (joy stick type).

Although only one of the six selector switches was malfunctioning at the time, all six switches were replaced to reduce the possibility of failure of the other five switches. These bypass switches perform similar functions and operate in the same manner. However, the new joy stick is supplied with a mechanical latch to prevent unintentional movement. Replacement of all six switches is consistent with the guidelines of NUREG 0700 "Guidelines for Control Room Design Reviews."

This modification did not cause any operational changes to the Neutron Monitoring System and did not functionally impact any system. Therefore, the modifications did not involve an unreviewed safety question.

Replacement of Circulating Water Flow Transmitters

PDC No.: 89-038

SE No.: 2390

FSAR Reference: Figure 11.6-1

This modification replaced a non-safety related target flow transmitter. Replacements "in kind" are not available and the existing piping and fittings were modified for the equivalent flow transmitter. This change did not involve safety related equipment; therefore, an unreviewed safety question did not exist.

Addition, Cation Tank 112 Pressure Gauge

PDC No.: 89-046

SE No.: 2413

FSAR Reference: Figure 11.7-2

A permanent pressure gauge replaced a temporary pressure gauge installation that was used in transporting resins from the cation regeneration tank to the ultrasonic resin cleaner. In addition, six other existing non-safety related gauges were replaced with equivalent pressure gauges.

This installation replaced a non-safety related temporary pressure gauges including associated Tygon Tubing, valves and components and replaced six pressure gauges all in the condensate demineralizer resin regeneration system.

This change did not involve an unreviewed safety question because the pressure indicator that was added and the ones that were replaced are in a non-safety system and perform no safety-related function.

Argon Gas Rack Modification

PDC No.: 90-005

SE No.: 2462

FSAR Reference: Appendix P

A description of this change is not provided because it would contain Safeguards Information. The effects of this plant changes on FSAR - Appendix P "PNPS Security Plan" have been reported under 10CFR50.54.

Recirculation Speed Control Modification

PDC No.: 90-014

SE No.: 2484

FSAR Reference: 7.9.4.3, 7.9.4.4.1, 7.9.5, 7.9.6, Figure 7.9-1

This design change decreased the rate of change of the recirculation pump motor generator scoop tube position. Decreasing the rate of change resulted in supplying the accelerating torque for a longer time period.

This modification produces no failures that are unbounded in severity by previously analyzed failures. This modification does not involve safety-related equipment and did not involve an unreviewed safety question.

Reactor Feed Pump Drain Line Valves

PDC No.: 90-024

SE No.: 2449

FSAR Reference: Figure 11.8-2

The "A" Reactor Feedwater Pump had one 1" globe valve in the drain lines of the suction and discharge piping of the pump. The "B and C" Reactor Feedwater Pumps each have double isolation valves in the drain lines of the pump.

The single drain valves leaked past their seat and allowed large volumes of feedwater to drain to the Clean Radwaste System. This lowered plant efficiency and caused unnecessary water to be processed through the Clean Radwaste System.

This change installed double isolation valves on the "A" Reactor Feedwater Pump suction and discharge pipe drain lines.

This change did not involve an unreviewed safety question because the affected portions of the Feedwater and Condensate Systems do not perform any safety function.

Removal of the Isolated Bus Sliding Disconnect Link

PDC No.: 90-026

SE No.: 2452

FSAR Reference: 8.2.1.2, Figures 8.2-1, 8.2-2

This design change eliminated the sliding disconnect links on the Isolated-phase Bus by welding aluminum bus bars in their place. The Isolated-phase bus delivers power from the Station Main Generator to the Main Transformer and is non-safety related. This modification did not involve an unreviewed safety question.

Make Temporary Modification 89-32 Permanent

PDC No.: 90-029

SE No.: 2486

FSAR Reference: Figure 8.4-4

Temporary modification TM 89-32 removed six 1 KW heater strips from the upper bank of the lube oil purifier heater to replace six identical 1 KW heaters in the lower bank which had failed. This modification reduced the upper bank to 42 from 48 KW. When replacement heaters arrived on site, they could not be installed in the upper bank due to an obstruction in the empty heater well. This PDC made TM 89-32 permanent by leaving the six heater wells empty.

This modification did not involve an unreviewed safety question because the lube oil purification and storage system is not safety related and performs no safety-related function.

Motor Replacement for MOV220-01

PDC No.: 90-046

SE No.: 2510, 2482

FSAR Reference: Figure 8.4-2

The motor for MOV220-1 needed to be replaced and a replacement in kind for this motor was unavailable in the short term. A motor having the same torque output rating but a lower output speed was installed in place of the existing MOV220-1 motor. New overload relays were installed in MCC B20 to provide proper overload protection of the new motor.

MOV220-1 is a primary containment isolation valve. This change affected the operating time of the valve (7 seconds to 14 seconds); however, it is well within the maximum operating time of 30 seconds. This change did not involve an unreviewed safety question.

Use of IEEE 344-1987 to Document Seismic Qualification

SE No.: 2310

FSAR Reference: 12.2.5.4

This change upgrades the original design basis seismic qualification requirements for existing/replacement in-kind Class I electrical and/or mechanical components from the original Bechtel Specifications (less rigorous than IEEE 344-1971) to IEEE 344-1987. This affects components manufactured, purchased, and/or installed prior to 1983 for Pilgrim Station. This change does not alter the seismic qualification requirements of IEEE 344-1975 for equipment purchased during/after 1983.

The use of IEEE 344-1987 is a technical and documentation upgrade of the original design basis requirements (IEEE 344-1971). Consequently, this change did not involve a potential unreviewed safety issue.

Testing of the "A" Recirculation System Motor Generator Set

Temporary Procedure 90-11

SE No.: 2442

FSAR Reference: None

The 'A' Recirculation Motor Generator (RMGs) tripped on several occasions due to voltage oscillations. The vulnerability of the RMGs has been reduced by removing the electronic speed control circuit and operating the speed control positioner manually by hand crank. Oscillation of the voltage regulation control loop has been observed when the speed control scoop tube positioner is mechanically locked up. This indicates that the voltage regulator may have been malfunctioning or may require adjustment.

Recording RMGs system responses during the imposition of speed step changes at reactor power levels between 40% and 50% provided the data needed to properly adjust/repair the voltage regulator circuit. It also provided additional data which can be used to assist root cause determination of the previous system transients.

This testing of the motor generator set did not involve an unreviewed safety question because the effect on safety functions due to the actions of this test are bounded by previous analyses in the FSAR. Furthermore, this test invoked all applicable Technical Specification limits.

Augmented Offgas System

Procedure 7.9.10

SE No.: 2466

FSAR Reference: 9.4.4.1.4, Figure 9.4-5

This Safety Evaluation analyzed the effects of allowing operation of the Augmented Offgas (AOG) System below the Design Bases Holdup times due to

degraded charcoal filters. It concluded that operation of the AOG in accordance with FSAR Figure 9.4-5 will provide assurance that Technical Specification Limits are met with the system operating below the Design Basis until the charcoal beds are completely restored.

This change did not involve an unreviewed safety question.

Update the Source Data Which Supports the Emergency Operating Procedures

SE No.: 2480

FSAR Reference: None

This Safety Evaluation reviewed the effects of miscellaneous administrative changes to the Emergency Operating Procedures (EOP's). These changes did not involve an unreviewed safety question and involved references for source data for the EOPs and improved operator usability of the EOP's.

Hardness Testing of Salt Service Water Pump Columns

Temporary Procedure 90-09

SE No.: 90-04

FSAR Reference: None

This procedure (TP90-009) provided plant personnel with detailed instructions to assemble and perform Rockwell Hardness Testing on the Salt Service Water Pump Columns.

This testing did not involve an unreviewed safety question because the pumps were capable of performing their safety function, there were no new failure modes introduced, and there was no potential to create any new plant transients that could challenge safety systems.

Backfilling Condensing Chambers 12B and 13B and Instrument Lines

Procedure 3.M.2-12.3

SE No.: 90-10

FSAR Reference: None

This safety evaluation is for Procedure 3.M.2-12.3 Rev. 0 which provides instructions for controlling isolation of instruments downstream of condensing chambers 12B, 13B (reactor water level and pressure instruments) to slowly backfill each sensing line. This procedure is used for maintenance activities to remove trapped air from instruments, sensing lines and refill condensing chambers that may have lost volume due to evaporation.

Work performed under this procedure does not involve an unreviewed safety question because no new failure modes are postulated and margin of safety remain intact.

RHR "A" Loop and Shutdown Cooling Suction Piping Flush, Fill and Vent Test

Temporary Procedure 90-66

SE No.: 90-36

FSAR Reference: None

This test was performed to check the procedure for flushing, filling and venting of the RHR piping prior to entering Shutdown Cooling. To accomplish this, both test equipment and installed plant equipment were used. Existing plant procedures were followed as much as possible in the Temporary Procedure (TP) to best simulate plant conditions as they exist after flushing, filling and venting. Additional opening of vents were performed after venting to check for air and/or voids at various points in the RHR piping that may have been produced by this procedure and normal venting procedures.

Three times since December 1989, Group 3 isolations have occurred. The suspected source of the isolation signal is the actuation of 5-PS-261-23A and/or B due to a momentary pressure spike. To further evaluate this as a cause, test equipment (pressure transmitter and recorder) were installed to monitor pressure at the pressure switch during the performance of this TP. The TP essentially followed the normal sequence for flushing, filling and venting, but will add provisions for checking for air or voids in other parts of the piping. This test will determine if the flushing, filling and venting performed prior to entering Shutdown Cooling is contributing to the Group 3 isolations.

This test did not involve an unreviewed safety question because the test equipment used to evaluate normal plant procedures was installed on a pressure switch that was not required to be operable. Technical Specifications limits for instruments (Table 3.2.A) were maintained.

RCIC System Test

Temporary Procedure 90-68

SE No.: 90-38

FSAR Reference: None

Temporary Procedure 90-068 operated the RCIC System and injected design flow (400 gpm) into the vessel. The test also performed a reverse flow protective check of the injection check valve after the system was secured.

There was no effect on the safety function of the fuel or the reactor coolant pressure boundary as a result of this test. The Temporary Procedure operated RCIC in the mode of operation for which it was designed. No unreviewed safety question was introduced as a result of this test.

HPCI Turbine Overspeed Test

Temporary Procedure 90-73

SE No.: 90-44

FSAR Reference: None

Temporary Procedure 90-073 was written to allow the High Pressure Coolant Injection (HPCI) System to reset once after an overspeed trip on turbine start without manually tripping the turbine. This temporary procedure allowed troubleshooting of the HPCI turbine to determine the reason for the overspeed trip on start of turbine. The normal HPCI operability surveillance has a caution statement in it not allowing the turbine to restart if it trips during a start. This temporary procedure will allow the turbine overspeed trip to reset and the turbine to restart once.

The automatic reset of an overspeed trip and subsequent restart of the turbine have been previously analyzed and found to have no effect on the safety function of the HPCI system turbine pumps and piping. A potential unreviewed safety questions did not exist.

Leak Test Interval for Alpha Sources

Procedure 6.6.010

SE No.: 90-47

FSAR Reference: 12.4.1

This is a change in the procedure described in the PNPS FSAR, Chapter 12.4.1, which states that alpha-emitting radioactive test sources would be leak tested at three month intervals and the quantities that would be tested are represented in Schedule B, Column II, 10CFR31.100.

The purpose of the change is to document the analysis of the PNPS procedure which implements Technical Specification 4.0. Both the existing procedure and the Technical Specification state that the leak test frequency is six months and sources which require leak testing are those that are greater than 100 microcuries of beta-gamma or 5 microcuries of alpha emitting radioactive material.

Specific regulatory frequencies for leak testing alpha-emitters are found in 10CFR35.59 and 10CFR39.35, both of which require a six-month frequency. Both of these regulations only require leak testing alpha sources with more than 10 microcuries of activity.

The change to the FSAR reflects consistency with Technical Specifications and NRC regulations that prescribe similar surveillance frequencies.

This change did not involve an unreviewed safety question.

Emergency Diesel Fuel Oil Tank Tightness Test

Procedure 3.M.3-62

SE No.: 90-54

FSAR Reference: None

The purpose of this procedure is to test the integrity of the Underground Storage Tanks T126A and T126B. Performance of this procedure will not reduce the volume of diesel oil below the limit of T.S. 3.9.A.3. Furthermore, the tanks are preferred full for testing. Therefore, the T.S. requirement of 19,800 gallons onsite for each diesel will be maintained.

The safety function of the Standby AC Power Source is not impaired by this test. There was no potential for an unreviewed safety question.

Annual Revision to the PNPS Emergency Plan

SE No.: EP 90-01

FSAR Reference: Appendix N

The purpose of this safety evaluation was to address the impact of changes to the PNPS Emergency Plan upon the FSAR. The changes made to the emergency plan are a result of the Emergency Preparedness Department annual review and revision process. Since the Emergency Plan is Appendix N in the FSAR, all changes made to the plan are considered to be changes to the FSAR, thus requiring a safety evaluation.

These changes have been previously submitted to the NRC under 10CFR50.54.