TENNESSEE VALLEY AUTHORITY

Division of Nuclear Power

ANNUAL OPERATING REPORT

BROWNS FERRY NUCLEAR PLANT

January 1, 1979 - December 31, 1979

Docket Numbers 50-259, 50-260 and 50-296

License Numbers DPR-33, DPR-52 and DPR-68

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PLANT MODIFICATIONS SUMMARY

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Modification	Safety Evaluation
DCR 1884 - Main Steam - Unit 3	Replaced the currently installed fiberbat insulation on the main steam and feedwater lines in the steam vault with 6" of calcium silicate or the equivalent. The DCR was completed. This modification reduced the steam vault temperature by reducing the amount of heat loss from the pipes during normal operation and did not affect the operability of the systems.
DCR 1906 R1 - Main Steam - Unit 3	Installed two Crosby safety relief valves in lieu of Target Rock valves on header positions 1-30 and 1-31. Moved the 1115 psig set pressure valve at position 1-30 to position 1-42 and the 1105 psig set pressure valve at position 1-31 to position 1-41. The position 1-41 remained an ADS position with the new set pressure valve installed. The DCR was completed. The safety evaluation prepared to cover this modification concluded that the plant safety was not adversely affected by these modifications.
ECN P0294 - 4-kV Shutdown Boards - Unit 3	Interchanged the 1500 to 5 current transformers currently used for metering and undervoltage with the 1200 to 5 current transformers used for differential protection on the 4-kV shutdown boards 3EA, 3EB, 3EC, and 3ED. The ECN was completed. The changes provided by the ECN will ensure proper operation of the differential current protection circuit and it did not degrade the seismic qualification of the boards.
ECN P0164 - Service Air - Unit 3	Installed two isolation valves and three test connections in the unit 3 drywell service air line, elevation 565'. The ECN was completed. This ECN assures that the service air system has properly documented, qualified isolation valves and provides means of testing the leak tightness of the isolation valves. The modification is an improvement to plant safety.

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Modification	Safety Evaluation
ECN P0230 - Reactor Recirculation - Unit 3	Rotated the motor operators on recirculation valves 68-3 and 68-79 on unit 3. The ECN was completed. This modification was required to allow use of the replacement motors on the recirculation system isolation valves as the replacement motors are slightly longer than the original equipment due to a change in the design of the motor brake. The seismic analysis states that the operator rotations are acceptable and the spare motors are of the same size rating as the original motors.
ECN P0142 - Reactor Building Ventilation (Primary Containment) - Unit 3	Added 3/4" diameter carbon steel test vents to the suction and discharge lines of the compressor used to establish and maintain a pressure differential between the drywell and suppression chamber to allow leak rate testing of primary containment isolation valves. The ECN was completed. Implementation of this ECN permits leak rate testing of the primary containment isolation valves. Such testing adds assurance that the isolation valves will perform their isolation function.
ECN P0242 - Main Steam - Unit 3	Removed the packing bleed-off valves and capped the bleed-off line on each main steam isolation valve. The ECN was completed. This modification did not alter the function of the MSIV steam packing as a portion of the primary coolant loop boundary nor did it affect MSIV performance.
ECN P0270 - Reactor Building Crane - Common	Fabricated six bushings for the 125-ton main hook sheaves for the reactor building overhead crane and drilled the lower block shaft to supply lubrication to each sheave. Substitution of a high strength QQC390A-862 manganese was used for fabrication of the bushings as the original Lubrite-424 manganese was no longer available. The ECN was completed. The modification had no effect on the load-carrying capability of the main lifting hook nor did it affect previous analyses of the crane.

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Modification	Safety Evaluation
DCR 1617 - High Pressure Coolant Injection - Units 1, 2, and 3	Modified HPCI turbine reversing chamber holddown bolting to prevent failures. The changes consisted of bolting the reversing chamber directly to the support ring, lockwired the cap screws and eliminated the clamping plate. The DCR was completed. The modification improved the reliability of the turbine. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the FSAR was not increased.
ECN P0090 - Fuel Handling and Storage - Units 1, 2, and 3	Changed the refueling platform interlock switch so that a contact of the switch can be used in the rod block circuit instead of the relay K4 contact. The ECN was completed. The modification to the refueling platform rod block interlock circuit (requested by GE) did not affect the Technical Specifications for the refueling interlocks nor any other system that is defined in the basis for any technical specifications.
ECN P0224 - Reactor Recirculation - Unit 3	Added various test connections to recirculation pump seal water line between valves 68-507 and 508; 508 and 550; 522 and 523; 523 and 555. The ECN was completed. The modification provides a means of testing valves in the recirc pump seal system per NRC requirement. The test connections meet the same requirements with regard to piping class and seismic status as the existing gland seal system. Therefore, the margin of safety was not reduced.
ECN P0236 - Reactor Core Isolation Cooling, Residual Heat Removal, Core Spray - Units 2 and 3	Adjusted spring load on hanger as necessary to provide adequate support for Velan swing check valves on RCIC, RHR and Core Spray systems. The ECN was completed. The readjustment of the hangers will assure the integrity of the systems and assure compliance to design load.
ECN P0213 - Fuel Handling and Storage - Common	Installed a bellows-type expansion joint in the fuel transfer canal between units 1 and 2. The ECN was completed. The modification improved the fuel transfer canal seal without creating a new failure mode or increasing the probability of fuel transfer canal seal failure. The new seal exceeds the designed temperature range of the original seal.

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Modification	Safety Evaluation
ECN P0189 - Standby Gas Treatment - Common	Returned the settled conduit bank from the diesel generator building to the gas treatment building to its proper position. Replaced the backfill after grouting was completed. The ECN was completed. Seismic qualification of the conduit bank has been restored. The modification did not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety.
ECN P0089 - Associated Electrical - Unit 3	Installed junction boxes inside and outside the unit 3 drywell near equipment location for connecting new containment leak rate measurement test equipment. The ECN was completed. The use of terminal strips inside the junction boxes equal or exceed NEMA 4 requirements. Implementing the modification did not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety.
ECN L2015 - Fire Protection - Common	Provided class "A" and "ABC" portable fire extinguishers throughout the safety-related areas of the plant. The ECN was completed. The addition of fire extinguishers in some areas and the replacement of existing extinguishers with comparable or superior extinguishers upgraded the ability of plant personnel to suppress a fire in a safety-related area.
DCR CC #13 - Fuel Handling and Storage - Unit 2	Replaced up to 232 7 x 7 fuel assemblies with 8 x 8 retrofit fuel assemblies. The DCR core component was completed. The fuel assemblies that were replaced are no longer capable of providing full reactor power. The 8 x 8 retrofit fuel is the vendor's current design and will provide superior performance.
DCR 1641 - Reactor Core Isolation Cooling - Unit 2	Reroute the vent line from the auxiliary oil sump away from the governor end bearing housing to eliminate the potential for oil flooding in this area. The line was routed to direct an oil spray into the mesh of the spiral gears driving the governor. The DCR was completed. The modification helps assure proper operation of the RCIC turbine assembly yet does not affect any other system.

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Modification	Safety Evaluation
ECN'S L1741 and L1375 - High Pressure Coolant Injection - Units 1 and 2	Replaced temporary valve PCV-73-43T2 with a permanent valve PCV-73-43. The ECN's were completed. The permanent valve is a qualified pressure controlling valve that replaced the temporary unqualified valve. This permanent valve will provide the requested pressure reduction.
ECN'S L1979 and L2111 - CO_2 Fire Protection - Common	CO_2 Fire Protection System in Computer Rooms - Changed the discharge nozzle arrangement and size; increased CO_2 discharge time to decrease possibility of thermal shock to computers; added CO_2 pressure actuators to the fire damper assemblies. The ECN's were completed. The modifications were made to satisfy commitments to the NRC and to enhance the capability of the CO_2 system. The probability or consequences of an accident or safety equipment malfunctions were not increased.
ECN L1473 - Residual Heat Removal - Unit 2	Removed disc from FCV-74-66 and replaced with V-notch disc. The ECN was completed. This modification decreased the vibration in the angle valve during low flow and decreased the probability of system failure due to vibration. The modification also improves the controlling of the reactor cooldown rate.
ECN L2031 - Reactor Feedwater - Units 1 and 2	Installed two additional hangers on 1" instrument line X-29B inside drywell. The ECN was completed. The addition of the supports increased the reliability of the associated reactor vessel level instrument. The modification did not affect any functional aspect of the instrument or system operation.
ECN P0109 - Residual Heat Removal - Unit 2	Replaced GE type CR 2820 time delay relay with Agastat time delay relay for unit 2 RHR and core spray systems. The ECN was completed. The Agastat relays assure that the time delay function is accurate even after long periods in the de-energized condition. The modification did not alter or affect the operation of the systems; the margin of safety was not reduced.

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Modification	Safety Evaluation
ECN P0057 - Main Steam - Unit 2	Installed improved timer to replace time delay function of CR 2820 relays in unit 2 automatic depressurization system. The ECN was completed. The replacement of GE relays with Agastat time delay relay will not affect the operation of the A.D. system nor any other system other than to improve reliability. The Agastat time delay relay has been proved to be a highly reliable component exhibiting long life and excellent repeatability.
ECN P0155 - Main Steam - Unit 1	Substitution of Target Rock Corp. two-stage safety/ relief valves (new model 7567F) in place of existing three-stage valves (model 67F). The ECN was completed. This modification incorporated the latest design and manufacturing techniques and increased unit availability. The probability of occurrence or the consequences of an accident or the malfunction of equipment important to safety was not increased.
ECN L1993 - High Pressure Coolant Injection - Unit 2	Installed self-locking set screws in governor actuator, installed spray nozzle in governor, increased auxiliary oil pump suction piping to 2-inch diameter, revised loop seal on stop valve drain piping, replaced 200-ohm potentiometer in governor control circuit with 200-ohm resistor, modified tubing between actuator and servo, and installed auxiliary oil sump on HPCI and/or RCIC turbines. The ECN was completed. The modifications were initiated by GE to correct equipment failures or deficiencies. The changes complied with the design and material certification requirements and are compatible with the existing HPCI and RCIC system components. The margin of safety was not reduced.
ECN L2004 - Standby Gas Treatment - Unit 3	Added instrumentation and controls in unit 3 control room for use with trains A, B, and C and revised units 1 and 2 instrumentation and controls. The ECN was completed. This modification did not change or affect the system operation as described in the FSAR.

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Modification	Safety Evaluation
ECN L1703 - Neutron Monitoring - Unit 2	Modified the ICP's in the power range neutron monitoring cabinet (9-14). The ECN was completed. This modification improved the performance of the 20-volt power supply and the safety system by eliminating a potentially unsafe condition. This was a product improvement modification requested by GE.
ECN P0205 - Reactor Recirculation - Units 1 and 2	Revised the RPT trip logic from a two out of a four logic to a two out of two logic for turbine stop valves to allow for reactor protection system surveillance testing. The ECN was completed. The probability of occurrence of an accident or malfunction of equipment important to safety previously evaluated in the FSAR was not increased by the modification.
ECN P0058 - Core Spray - Units 1 and 2	Installed new time delay relays to replace damaged CR122AT relays on units 1 and 2 core spray system. The ECN was completed. The existing type generated a hazardous amount of heat, the new relays reduces this type of hazard which is an improvement in safety. The reliability of the replacement relay is considered at least equal to the existing relay.
ECN L2077 - High Pressure Coolant Injection - Unit 1	Modified the lift rod linkage in the control valve linkage assembly on the unit 1 HPCI turbine. The ECN was completed. The modification reduced the bending loads on the lift rods to an acceptable level. It improved the reliability and availability of the HPCI turbine.
ECN P0069 - Associated Electrical Equipment - Units 1 and 2	Added a second level of undervoltage detection with a time delay for the standby auxiliary power system. The ECN was completed. A review of the existing Tech Specs confirmed that the modification did not affect the margin of safety as defined in the basis (3.9/4.9) auxiliary electrical system.

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Modification	Safety Evaluation
DCR 1118 - Main Steam - Unit 1	Installed Target Rock filter plugs P/N 100768-1 in all MSRV's (three-stage) installed in unit 1 and the spares for unit 1. The ECN was completed. The modification helped reduce the potential for pilot seal failure and the occurrence of pilot leakage due to foreign material entering the pilot stage of the MSRV's without affecting valve performance parameters such as setpoints, delay time, stroke time, etc.
DCR CC #11 - Fuel Handling and Storage - Unit 3	Replaced 208 8 x 8 fuel assemblies with 8 x 8R fuel assemblies. The DCR core component was completed. The 8 x 8 retrofit fuel is the vendor's current design and will provide superior performance. We had NRC approval prior to modification and their review showed no different type accidents or malfunctions were believedto exist.
ECN'S L1496 and L2064 - RHR Service Water - Unit 2	Removed disc and seat from 2-FCV-23-46 and replaced with "V"-notch disc. Replaced seat rings as required. The ECN's were completed. The modifications did not affect the design function of the RHRSW control valves. However, they did help the valves to operate more reliably in the high discharge pressures which they are subjected to. The margin of safety was not reduced.
ECN'S L1496 and L2064 - RHR Service Water - Unit 3	Removed disc from FCV-23-34, -40, -46, and -52 and replaced with "V"-notch disc. Replaced seat rings as needed. The ECN's were completed. The modification did not degrade the performance characteristics of the valves; therefore, the probability for an accident or malfunction of a different type than any evaluated previously in the SAR was not created by the modification.
DCR 1338 - Main Steam - Units 1 and 2	Installed improved diaphragms in Target Rock safety/relief valve air operators. The DCR was completed. The replacement diaphragms utilize the same materials and essential design parameters as the original diaphragms. The modification assured that the operability, reliability, and service life of the main steam relief valve air operators were maintained at their "as procured" levels if not improved.

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Modification	Safety Evaluation
ECN P0021 - Main Steam - Units 2 and 3	Replaced Target Rock relief valves PCV-1-41 and PCV-1-5 (4.94" throat bore) with Target Rock relief valves having a throat diameter of 5.030 inches. The ECN was completed. The effects of replacing the MSRV's have been determined not to create the possibility for an accident or equipment malfunction of a different type than any evaluated previously in the Safety Analysis Report.
DCR 1249 - Fuel Handling and Storage - Unit 3	Replaced existing fuel grapple head on refueling platform with a new redundant hook, fuel grapple head. The DCR was completed. The redundant hook grapple head reduced the possibility of a fuel bundle drop caused by grapple head malfunction.
ECN L2043 - Main Steam - Units 1, 2, and 3	The second solenoid valve on the air operator was removed and the single solenoid left on the MSRV. The ECN also authorized the use of either ASCO model HTX 8300 B68F or Allied Control Division of Automatic Valve Corporation model C54505 solenoid valves as single solenoid valves on the MSRV's. The ECN was completed. The modification did not degrade the reliability or functional integrity of the MSRV's. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR was not created.
DCR 1641, ECN'S L1889 and L1993 - Reactor Core Isolation Cooling, High Pressure Coolant Injection - Units 1 and 3	Installed self-locking set screws in governor actuator, installed spray nozzle in governor, increased auxiliary oil pump suction piping to 2-inch diameter, revised loop seal on stop valve drain piping, replaced 200-ohm potentiometer in governor control circuit with 200-ohm resistor, modified tubing between actuator and servo, and installed auxiliary oil sump on HPCI and/or RCIC turbines. The DCR and the ECN's were completed. The modifications were initiated by GE to correct equipment failures or deficiencies. The changes complied with the design and material certification requirements and are compatible with the existing HPCI and RCIC system components. The margin of safety was not reduced.

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Modification	Safety Evaluation
ECN L2115 - Main Steam - Units 1 and 3	Removed main steam safety valves 1-501 and 1-537 from main steam lines B and C and installed blind flanges. Installed two main steam safety-relief valves, one on main steam line A and one on line D. Provided piping from these two valves to the discharge tailpipes. Installed new tailpipes with associated snubbers, snubber supports and hangers for the two new MSRV's. The tailpipes run from the MSRV's to the missile shield just inside the drywell. The ECN was completed for unit 1. On unit 3 only the fabrication of the two tailpipes to go to the new MSRV's was completed. The changes implemented by this ECN provided greater conservatism to the safety-relief system and related systems. The Tech Spec changes were supported by GE analysis and approved by the NRC. The margin of safety was not reduced by implementing the modifications covered by the ECN.
ECN L2020 - Reactor Recirculation - Unit 1	Installed redundant trip breakers and performed inspection and post-modification tests on the recirculation pump trip modification. The ECN was completed. The probability of occurrence of an accident or malfunction of equipment important to safety previously evaluated in the FSAR was not increased by this modification.
ECN P0017 - Containment Inerting - Units 1 and 3	Modified H_2 sensor mounting brackets and installed additional H_2 sensors in the drywell and torus. The ECN was completed. The probability or consequences of an accident or safety equipment malfunction was not increased.
DCR CC #10 - Neutron Monitoring - Unit 1	Changed out LPRM detector assemblies and performed pre- and post-installation testing on LPRM detectors. The DCR core component was completed. The modification did not involve a change in any LPRM design specifications and did not affect the plant safety performance.

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Modification	Safety Evaluation
ECN L1990 - Control Rod Drive - Unit 3	Removed 4" CRD return piping from reactor pressure vessel to reactor water cleanup system. Removed CRD hydraulic return line reactor vessel nozzle safe end and replaced with a cap. Performed post modification test. The ECN was completed. Major components in the CRD system remained unchanged. Only the operating modes are slightly different. The operating characteristics of the CRD system are not changed relating to accidents and transients; therefore, the margin of safety was not reduced.
ECN L1967 - Reactor Recirculation - Unit 1	Replaced existing recirc flow transmitters FT-68-5A, 5B, 81A, and 81B with new Rosemont transmitters. The ECN was completed. The Rosemont transmitters are an acceptable substitute for the Fischer and Porter transmitters which are no longer manufactured and did not reduce the margin of safety.
ECN L2086 - Main Steam - Units 1 and 2	Replaced recorder TR-1-1 associated with the main steam relief valve tailpipe temperatures with a recorder that gives a display of multipoints that can be interpreted following a reactor scram. The ECN was completed. The modification did not affect the operation of the relief valves but improved the operator's ability to monitor action which may occur.
ECN P0192 - RHR Service Water - Unit 1	Relocated RHRSW vent valves on top of RHR heat exchangers 1A, 1B, and 1D. The ECN was completed. The function of the vents was not altered. The probability of an accident or malfunction of a different type than evaluated previously in the FSAR was not created.
ECN P0074 - Reactor Recirculation - Unit 1	Installed a flange connection at the blind end of Grinnell snubber SS3B-115^{o} on unit 1 reactor recirculation system. The ECN was completed. The modification reduced the manhours and exposure time in the removal and installation of the shock arrestors. Nothing in the change modified the operating characteristics or significantly altered the reliability of the shock arrestors.

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Modification	Safety Evaluation
ECN L1946 - Containment Atmosphere Dilution - Units 1 and 3	Install two 1/2" vent lines with double valves on each line of the CAD purge headers. The ECN was completed. The modification was necessary for integrated leak rate test accuracy. The addition did not affect the safety function of the CAD system adversely.
ECN L2073 - Reactor Building Structure - Unit 3	Service water tunnel, south wall of reactor building, cut hole in containment and installed 4" diameter pipe stud with internal cap to protect containment isolation. The ECN was not completed. The addition of the sleeve with its cap did not violate secondary containment. The use of this sleeve was necessary to allow modification and maintenance work required to assure safe operation of the plant.
ECN'S L2099 and P0097 - Communications - Common	Public safety service radio communication, installed conduit and radio cabinets. Excavated for conduit from east end of switchyard to rear access portal. The ECN was not completed. Only a small portion of the work covered by the ECN's was completed. The total modification will allow communication from plant to local sheriff, other off-site security posts,and mobile units necessary to meet NRC requirements.
ECN L1992 - Reactor Building Ventilation - Unit 2	Reactor water cleanup rooms, reworked the exhaust duct divisions at PR10, elevation 621' and plaster over the removable concrete blocks at the south wall of the heat exchanger room, the west wall of the RWCU pump room 2A, and the east wall of the RWCU pump room 2B. The ECN was completed. The modification allowed the ventilation system to function as it should providing flow rates necessary to maintain correct ambient temperatures. The improved ventilation will prevent spurious RWCU isolation without affecting the temperature sensors' ability to detect a RWCU break.
ECN P0204 - Containment Inerting - Unit 2	Added isolation amplifier between hydrogen sensor H_2E-76-38 and input amplifier H_2M-76-38. Amplifier was then removed and sensor replaced. The ECN was completed. This modification enhanced the ability of the affected monitoring unit to perform its function as stated in the Tech Specs.

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Modification	Safety Evaluation
ECN P0072 - 250V DC System - Units 1 and 2	Replaced GE type CLF Class J fuses with Shawmut Class J fuses in 250V DC circuits, battery board numbers 1 and 2. The ECN was not completed. Replacement of the GE fuses increased the safety of the system by ensuring that fully qualified fuses are used.
ECN P0006 - Security (Miscellaneous) - Unit Common	Installed security barrier over the RHR service water pumps. The ECN was not completed. The addition of the structural steel and grating did not affect the structural integrity of the intake pumping station, nor did it adversely affect the operation of the pumps.
ECN's L1964 and L1666 - Process Radiation Monitoring - Unit 1	Installed off-line liquid process radiation monitors with associated electronics, conduit, cables, pumps and piping on the RHRSW, RCW and RBCCW effluents. Also, a sample tap is provided as an integral part of the monitoring equipment. The ECN's were completed. The modification increased the sensitivity of the radiation detection and helped assure that the releases from the plant will be within limits.
ECN L1991 - Reactor Building Ventilation - Unit 3	Revised the ventilation duct system leading to and within the main steam vault to improve the air flow thus reducing the room operating temperature. The ECN was completed. The flow rate in the steam vault was increased up to the design flow rate, which was inadequately designed originally. The margin of safety was not reduced.
ECN'S P0143 and P0159 - Fuel Storage and Handling - Unit 3	Installed two HDFSS racks in the unit 3 fuel pool; drilled two holes in each tube containing Boral; and authorized the storage of new and irradiated fuel in all of the existing original fuel pool storage racks. The ECN's were not completed. Installation of the new racks per ECN P0143 did not adversely affect fuel storage in the pool. The storage of new and irradiated fuel in existing original fuel storage racks in the unit 3 pool did not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety.

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Modification	Safety Evaluation
ECN P0284 - Main Steam - Unit 3	Installed junction boxes, conduit and cable for the acoustic valve position monitor to the main steam safety relief valves. Installed acoustic pickups, charged amplifiers, positioned indicators and associated hardware for the acoustic position monitors for the MSRV's. The ECN was not completed. The addition of an acoustic valve position monitor to the main steam safety valves will not impair the operability or control of the relief or safety valve functions. It provides information on the valve positions to the operator in the main control room and inputs the information to the plant computer which is required in order to comply with recommendation of the NRC.
DCR CC #14 - Neutron Monitoring - Units 2 and 3	Installed LPRM assemblies of the GE-NA-200 breeder type and Westinghouse type WL-24018 to replace failed LPRM detector assemblies that were not projected to last until the next refueling outage. The DCR core component was completed for units 2 and 3. The new detectors meet the same design specifications but have improved linearity, better seal performance, and extended lifetime compared to the NA-100 type used in the initial cores of all the units.
ECN L2106 - Condensate Demineralizer - Unit 3	Installed additional test vents and a block valve for condensate demineralizer line to the drywell. The ECN was completed. The modification was necessary to allow testing of primary containment isolation valves 1383 and 1192. The probability or consequences of an accident or safety equipment malfunction was not increased.
ECN P0027 - Fuel Handling and Storage - Unit 1	Removed all spent fuel storage racks, control rod racks, and associated bracing south of the refueling slot except the fuel rack centered on the east end of the refueling slot in unit 1 spent fuel storage pool. The ECN was not completed. The total modification will remove the original fuel storage racks and control rod storage racks and replace them with new, higher-capacity fuel storage racks and new temporary control rod storage provisions. NRC approval was required and has been obtained. The total modification has not been completed.

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Modification	Safety Evaluation
DCR CC #12 - Fuel Handling and Storage - Unit 1	Replaced up to 156 7 x 7 fuel assemblies with 8 x 8R fuel assemblies. The DCR core component was completed. The 8 x 8 retrofit fuel is the vendor's current design and will provide superior performance. NRC approval prior to modification and their review showed no different type accidents or malfunctions were believed to exist.
ECN L2097 - Cooling Towers - Common	Replaced the cooling tower vacuum breaking systems valves (FCV-27-118A and B). The ECN was completed. The electrical configuration of the system was not changed. The modification did not interfere with the ability to break siphon, which is the only safety function associated with this equipment.
DCR 1381 - Residual Heat Removal - Unit 1	Fabricated and installed new head on RHR pump 1A seal heat exchanger. The DCR was completed. The replacement of the cast iron head with the carbon steel head did not change the seismic classification; the carbon steel head has superior material properties than the cast iron head and no components other than the seal heat exchanger were affected.
ECN L2091 - Main Steam - Unit 1	Increased the existing set pressure of the safety relief valves by 25 psig from 1080, 1090, and 1100 psig to 1105, 1115, and 1125 psig in unit 1. Increased the set pressure of the safety valves in unit 1 from 1230 psig to 1250 psig. The ECN was completed. The modification did not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety; the margin of safety was not reduced.
ECN L1809 - Fire Protection--Common	Relocated existing fire hose cabinet to another location on the same elevation in the radwaste building. The ECN was not completed. The relocation of the fire hose cabinet increased the area protected by the fire hose cabinet.

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Modification	Safety Evaluation
FCR 10 Reference P0017 - Containment Inerting (Drawing Changes) - Units 1, 2, and 3	This work plan was written to update as-constructed drawings. The following H_2 and O_2 sensors were not installed as shown on as-constructed drawings: H_2E-76-40 and O_2E-76-44 on units 1, 2, and 3; and O_2E-76-43A, O_2E-76-42A, and O_2E-76-42B on unit 2. The FCR was completed. This was a documentation change only; no physical work was done in the plant by this work plan.
ECN L1845 - Residual Heat Removal (LPCI) - Unit 3	Fabricated orifice plates 3A, 3B, 3C, and 3D for the unit 3 RHR system. The ECN was not completed ECN L1845 covers the LPCI modification. Only a portion of the work was accomplished. The fabrication of the orifice plates 3A, 3B, 3C, and 3D did not affect the nuclear safety of the plant. NRC approval was obtained before work began.
DCR 1330 - Reactor Recirculation - Units 1, 2, and 3	This work plan was for authorization to replace the Chevron type rod packing with Polypack seals with male adapters in the Grinnell seismic restraints equipped with cylinders manufactured by Lynair Corporation. The DCR was completed. Implementation of the DCR helped to assure that the requirement of the Technical Specifications are satisfied by improving the operability and reliability of the Grinnell hydraulic shock suppressors by improving the shock arrestor cylinder seal design.
ECN L9065 - Fire Protection - Common	Installed 12-inch line to tie diesel-driven fire pump to the existing yard raw water loop and installed conduit that would supply the fire pump. The ECN was not completed. Only a portion of the modification was completed. The addition of the diesel-driven fire pump will provide an additional diverse and redundant source of fire protection water at rated flow and pressure. It will significantly upgrade the reliability of the system to control possible fires in the plant. No possibility for degradation of plant safety is envisioned.

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Modification	Safety Evaluation
ECN P0141 - 480V Reactor MOV Boards - Unit 3	Core drilled holes for 480V MOV board 3E and set 480V MOV boards 3D and 3E. The ECN was not completed. No modification of the floor was necessary except providing anchorage for placement of the boards and this anchorage did not affect the structural integrity of the floor. The additional loading imposed by the boards on the floor did not jeopardize the structural integrity of the reactor building during postulated events.
ECN L1757 - High Pressure Fire Protection - Common	Installed additional fire hose racks and associated piping in the plant. Standardized the length of all 1-1/2" hoses in the plant at 100 feet. Installed additional fire equipment house at NE corner of water intake pumping station. The modification improved the coverage of the plant by fire protection equipment.

OTHER						
TOTAL						
MAINTENANCE (MECH.)	268	787	175	148.7	508.0	154.7
MAINTENANCE (ELEC.)	64	126	0	28.0	63.3	0.0
OPERATIONS	119	0	0	39.8	0.0	0.0
HEALTH PHYSICS	41	17	31	16.5	4.8	12.6
RESULTS (INSTR.CHEM)	106	0	0	40.7	0.0	0.0
ENGINEERING (SUPER.)	47	90	1	26.5	34.8	0.1
OTHER	1	1	38	0.1	0.2	24.1
GRAND TOTAL	646	1021	245	300.4	611.1	191.4

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL GREATER THAN 100 MREM			TOTAL MAN-REM GREATER THAN 100 MREM		
	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS AND OTHERS	STATION EMPLOYEES	UTILITY EMPLOYEES	CONTRACT WORKERS AND OTHERS
REACTOR OPERATIONS AND SURVEILLANCE						
MAINTENANCE (MECH.)						
MAINTENANCE (ELEC.)						
OPERATIONS						
HEALTH PHYSICS						
RESULTS (INSTR.CHEM)						
ENGINEERING (SUPER.)						
OTHER						
ROUTINE MAINTENANCE						
MAINTENANCE (MECH.)	266	610	63	148.5	449.4	25.8
MAINTENANCE (ELEC.)	64	120		28.0	61.9	
OPERATIONS	98			33.5		
HEALTH PHYSICS	40	17	29	10.4	4.8	12.2
RESULTS (INSTR.CHEM)	98			39.3		
ENGINEERING (SUPER.)	32	82	1	22.8	32.3	0.1
OTHER	1	1	34	0.1	0.2	23.3
INSERVICE INSPECTION						
MAINTENANCE (MECH.)						
MAINTENANCE (ELEC.)						
OPERATIONS						
HEALTH PHYSICS						
RESULTS (INSTR.CHEM)						
ENGINEERING (SUPER.)						
OTHER			4			0.8
SPECIAL MAINTENANCE						
MAINTENANCE (MECH.)		108	109		41.5	128.3
MAINTENANCE (ELEC.)		6			1.4	
OPERATIONS	1			0.2		
HEALTH PHYSICS	1		2	0.1		0.3
RESULTS (INSTR.CHEM)						
ENGINEERING (SUPER.)	9	6		2.8	1.9	
OTHER						
WASTE PROCESSING - RADWASTE						
MAINTENANCE (MECH.)	2			0.2		
MAINTENANCE (ELEC.)						
OPERATIONS	7			1.2		
HEALTH PHYSICS						
RESULTS (INSTR.CHEM)						
ENGINEERING (SUPER.)						
OTHER						
REFUELING						
MAINTENANCE (MECH.)		69	3		17.1	0.6
MAINTENANCE (ELEC.)	13			4.8		
OPERATIONS						
HEALTH PHYSICS	8			1.4		
RESULTS (INSTR.CHEM)	6	2		0.9	0.7	
ENGINEERING (SUPER.)						
OTHER						
OTHER						
MAINTENANCE (MECH.)						
MAINTENANCE (ELEC.)						
OPERATIONS						
HEALTH PHYSICS						
RESULTS (INSTR.CHEM)						
ENGINEERING (SUPER.)						
OTHER						
TOTAL						
MAINTENANCE (MEC...						

FATIGUE USAGE EVALUATION

The cumulative usage factors for the reactor vessels are as follows as of December 31, 1979:

Location	Usage Factor		
	Unit 1	Unit 2	Unit 3
Shell at water line	0.00421	0.00317	0.00283
Feedwater nozzle	0.20264	0.13592	0.10480
Closure studs	0.17644	0.11572	0.08561