DONALD C. COOK NUCLEAR PLANT
1993 ANNUAL OPERATING REPORT

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1.0 INTRODUCTION

1.1 PLANT DESCRIPTION

The Donald C. Cook Nuclear Plant is owned by Indiana Michigan Power Company and is located five miles north of Bridgman, Michigan. The plant consists of two nuclear power units, each employing a Westinghouse pressurized water reactor nuclear steam supply system. Each reactor unit employs an ice condenser reactor containment system. The American Electric Power Service Corporation was the architect-engineer and constructor.

Unit 1 and 2 reactor design power output (and licensed rating) are 3250 MWt and 3411 MWt, respectively. Unit 1 approximate gross and net electrical outputs are 1056 MWe and 1020 MWe, respectively. Unit 2 approximate gross and net electrical outputs are 1100 MWe and 1060 MWe, respectively. The main condenser cooling method is open cycle using Lake Michigan water as the cooling source for each unit.

1.2 REPORT PREPARATION

This report was compiled by W. R. Moran with the following individuals contributing information as follows:

Personnel Exposure Summary	-	J. R. Kambach
Steam Generator ISI Summary	-	C. A. Freer
Changes to Procedures	-	R. G. Vasey
Tests or Experiments Not Described in the FSAR	-	R. G. Vasey
Challenges to Pressurizer PORVs and Safety Valves	-	R. S. Ptacek
Reactor Coolant Specific Activity	-	S. W. McLea
Results of Irradiated Fuel Inspections	-	T. A. Georgantis
Changes to Facility - RFCs, MMs, PMs	-	R. G. Vasey
Changes to Facility - Temporary Modifications to Unit 1 & 2	-	R. G. Vasey

2.0 PERSONNEL RADIATION EXPOSURE SUMMARY

Table 1 provides a summary of the number of station, utility, and contractor (and others) personnel receiving exposures greater than 100 millirem in 1993. The total record dose for all personnel was 43.526 rem as measured by thermoluminescent dosimetry (TLD) and reported in accordance with Regulatory Guide 1.16.

TABLE 2 ANNUAL OPERATING REPORT - REG 1.16 FOR 1993

	# PERSONNEL >100 mR			TOTAL MAN-REM		
	STAT.	UTIL.	CONT.	STATION	UTILITY	CONTRACT
Reactor Operations & Surveillance						
Maintenance Personnel	0000	0000	0002	000.000	000.000	000.407
Operations Personnel	0007	0000	0000	000.696	000.000	000.000
Health Physics Personnel	0020	0000	0004	002.618	000.000	000.411
Supervisory Personnel	0001	0000	0000	000.107	000.000	000.000
Engineering Personnel	0000	0000	0000	000.000	000.000	000.000
Routine Maintenance						
Maintenance Personnel	0011	0000	0007	001.687	000.000	000.977
Operations Personnel	0000	0000	0001	000.000	000.000	000.153
Health Physics Personnel	0002	0000	0000	000.211	000.000	000.000
Supervisory Personnel	0000	0000	0000	000.000	000.000	000.000
Engineering Personnel	0002	0000	0000	000.280	000.000	000.000
In-Service Inspection						
Maintenance Personnel	0000	0000	0000	000.000	000.000	000.000
Operations Personnel	0000	0000	0000	000.000	000.000	000.000
Health Physics Personnel	0000	0000	0000	000.000	000.000	000.000
Supervisory Personnel	0000	0000	0000	000.000	000.000	000.000
Engineering Personnel	0000	0000	0000	000.000	000.000	000.000
Special Maintenance						
Maintenance Personnel	0001	0000	0042	000.128	000.000	006.537
Operations Personnel	0000	0000	0004	000.000	000.000	000.586
Health Physics Personnel	0000	0000	0003	000.000	000.000	000.351
Supervisory Personnel	0000	0000	0000	000.000	000.000	000.000
Engineering Personnel	0000	0000	0000	000.000	000.000	000.000
Waste Processing						
Maintenance Personnel	0000	0000	0002	000.000	000.000	000.692
Operations Personnel	0000	0000	0002	000.000	000.000	000.678
Health Physics Personnel	0002	0000	0007	000.320	000.000	000.877
Supervisory Personnel	0001	0000	0000	000.089	000.000	000.000
Engineering Personnel	0000	0000	0000	000.000	000.000	000.000
Refueling						
Maintenance Personnel	0000	0000	0000	000.000	000.000	000.000
Operations Personnel	0000	0000	0000	000.000	000.000	000.000
Health Physics Personnel	0000	0000	0000	000.000	000.000	000.000
Supervisory Personnel	0000	0000	0000	000.000	000.000	000.000
Engineering Personnel	0000	0000	0000	000.000	000.000	000.000
TOTALS						
Maintenance Personnel	0012	0000	0053	001.815	000.000	008.613
Operations Personnel	0007	0000	0007	000.696	000.000	001.417
Health Physics Personnel	0024	0000	0014	003.149	000.000	001.639
Supervisory Personnel	0002	0000	0000	000.196	000.000	000.000
Engineering Personnel	0002	0000	0000	000.280	000.000	000.000
GRAND TOTALS	0047	0000	0074	006.136	000.000	011.669

3.0 STEAM GENERATOR IN-SERVICE INSPECTION

3.1 UNIT 1 INSPECTIONS

During 1993, there were no steam generator in-service inspections performed for Unit 1.

3.2 UNIT 2 INSPECTIONS

During 1993, there were no steam generator in-service inspections performed for Unit 2.

4.0 CHANGES TO PROCEDURES

This section contains a brief description of the procedure changes implemented under the provisions of 10CFR50.59 and the associated safety evaluations.

4.1 CHEMISTRY PROCEDURES

4.1.1 Use of Ethanolamine

Description of Change:

Plant procedures 12 THP 6020 LAB.041 and 1 THP 6020 LAB.061 were revised when a change was made to the Unit 1 secondary side chemistry. The change in the chemistry was to use ethanolamine (ETA) for better pH and corrosion control.

Safety Evaluation Summary:

The use of ETA was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that the use of ETA is not expected to adversely impact the steam generator. ETA is currently used in four U.S. nuclear plants, and the data from these plants indicate improved pH control, reduced flow-accelerated corrosion, and no adverse effects on plant materials or secondary side chemistry.

5.0 TESTS OR EXPERIMENTS NOT DESCRIBED IN THE FSAR

This section describes procedures classified as "Test and Experiment", implemented under the provisions of 10CFR50.59, including the associated safety evaluation.

5.1 TESTS

5.1.1 Valve Leak Rate Testing

Description of Test:

Non-essential water isolation valve 1-WCR-955, which serves as a containment service isolation valve, was tested with the pressure in the reverse direction from that which would occur under accident conditions. This test was conducted using plant procedure 1 EHP SP.040.

Safety Evaluation Summary:

This test was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion was based on the fact that 10CFR50, Appendix J allows valves to be tested in the reverse direction providing that it is demonstrated that the results are equivalent to applying the pressure in the forward direction. An evaluation was performed, and it was determined that testing in the reverse direction would provide equivalent results.

5.1.2 Steam Dump Valve Test

Description of Test:

Performance testing of a refurbished steam dump valve was conducted utilizing a Unit 1 unused piping loop. The valve was installed in the loop and was stroked while data were obtained. This was performed under plant procedure 1 EHP SP.032.

Safety Evaluation Summary:

This test was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that the conditions resulting from this test are within normal operating conditions. Additionally, this procedure was modeled on the simulator before it was performed.

6.0 CHALLENGES TO PRESSURIZER POWER OPERATED RELIEF VALVES AND SAFETY VALVES

During 1993, there were no challenges on either Unit 1 or Unit 2 to the pressurizer power operated relief valves (PORVs) or the pressurizer safety valves as a result of the valves being called upon to mitigate an actual overpressure condition.

7.0 REACTOR COOLANT SPECIFIC ACTIVITY

During 1993, there were no instances on either Unit 1 or Unit 2 in which the reactor coolant I-131 specific activity exceeded the limits of Technical Specification 3.4.8.

8.0 IRRADIATED FUEL EXAMINATIONS

During 1993, no irradiated fuel examinations were performed because there were no scheduled refueling outages.

9.0 CHANGES TO FACILITY

This section contains a brief description of the design changes implemented under the provisions of 10CFR50.59 and the associated safety evaluations.

9.1 DESIGN CHANGES (RFCs)

9.1.1 Radioactive Waste System Modification

Description of Change:

DC-12-4109 replaced a 2-gallon per minute radwaste evaporator with a Duratek-design ion exchanger resin system. The Duratek system, which processes liquid radioactive waste, consists of six 36-inch diameter demineralization tanks, a 60-inch diameter deep bed filter, and associated components.

Safety Evaluation Summary:

This change was reviewed and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that the system is designed to the requirements of Regulatory Guide 1.143, it is located in an area where any leakage is routed to the radwaste system, and no effluents are discharged directly from the system.

9.1.2 New and Spent Fuel Pool Modification

Description of Change:

A revision to DC-12-3051 (spent fuel pool re-racking modification) added nine high pressure sodium lights, temporarily defeated the auxiliary building crane interlocks, installed a temporary power supply with a stepdown transformer, and temporarily removed various obstructions on the new and spent fuel pool walls.

Safety Evaluation Summary:

These changes were reviewed, and it was determined that they did not constitute an unreviewed safety question. This is based on the fact that all loads in excess of 2500 pounds passing over the new and spent fuel pool would be lifted in accordance with the requirements of NUREG 0612, the temporary power supply would be mounted in such a way that it would not damage fuel assemblies, and the new lights are of sufficiently light weight that the technical specification limitations on impact energy are met.

9.1.3 Unit 1 Steam Generator Chemical Addition System Modification

Description of Change:

DC-01-3090 changed the status of a system that was originally installed to supply a boric acid solution to the Unit 1 steam generators from temporary to permanent and also made modifications to the existing system. The system consists of an 850-gallon boric acid solution mixing tank, a pump to transfer the solution from the mixing tank to the chemical feed tank, and new, upgraded feedwater chemical feed pumps.

Safety Evaluation Summary:

This change was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that the system does not perform a safety function and the modification does not adversely interact with a safety-related system.

9.2 PLANT MODIFICATIONS (PMs)

9.2.1 Makeup Water System Modification

Description of Change:

Plant Modification 12-PM-1387 added a tee and a valve-isolated hose connection to the makeup water system discharge piping. A hose is periodically connected to this connection in order to supply water to reverse osmosis units that are being evaluated for improvements in makeup plant effluent water chemistry.

Safety Evaluation:

This change was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that no safety-related equipment is adversely impacted by this change.

9.2.2 Spent Resin Storage Tank Level Indication

Description of Change:

Plant Modification 12-PM-1059 removed the spent resin storage tank high/low level alarm because it was not functioning properly and repairs were impractical because of its location in an extremely high radiation area.

Safety Evaluation Summary:

This change was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that the level alarm is not required for the safe shutdown and isolation of the reactor nor is its use assumed in the mitigation of design basis accidents.

9.2.3 Circulating Water Discharge Points

Description of Change:

Plant Modification 12-PM-821 installed sample pumps and routed one-inch steel sampling piping between the sample pumps and each unit's discharge tunnel access manhole. The modification was made for improved monitoring capability because of the increase in chemical additions to the circulating water for zebra mussel control.

Safety Evaluation Summary:

This modification was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that this system is not required to mitigate the consequences of an accident nor is any safety-related equipment adversely impacted.

9.3 MINOR MODIFICATIONS (MMs)

9.3.1 Sample Line Relocation

Description of Change:

Minor Modification 01-MM-245 relocated a 1/2-inch sample line installed in the waste gas disposal system. This change moved the sampling point upstream of an isolation valve, allowing samples to be taken whenever the waste gas compressor was running.

Safety Evaluation Summary:

This change was reviewed, and it was determined that it did not constitute an unreviewed safety question. This conclusion is based on the fact that moving the sample did not alter the function of the system.

9.4 TEMPORARY MODIFICATIONS (TMs)

None.

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