



**Commonwealth Edison**

Quad Cities Nuclear Power Station  
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AMS-94-01

January 5, 1994

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

SUBJECT: Quad Cities Nuclear Station Units 1 and 2  
Monthly Performance Report  
NRC Docket Nos. 50-254 and 50-265

Enclosed for your information is the Monthly Performance Report covering the operation of Quad-Cities Nuclear Power Station, Units One and Two, during the month of December 1993.

Respectfully,

COMMONWEALTH EDISON COMPANY  
QUAD-CITIES NUCLEAR POWER STATION

Anthony M. Scott  
System Engineering Supervisor

AMS/dak

Enclosure

cc: J. Martin, Regional Administrator  
T. Taylor, Senior Resident Inspector

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QUAD-CITIES NUCLEAR POWER STATION

UNITS 1 AND 2

MONTHLY PERFORMANCE REPORT

December 1993

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS & ELECTRIC COMPANY

NRC DOCKET NOS. 50-254 AND 50-265

LICENSE NOS. DPR-29 AND DPR-30

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## I. INTRODUCTION

Quad-Cities Nuclear Power Station is composed of two Boiling Water Reactors, each with a Maximum Dependable Capacity of 769 MWe Net, located in Cordova, Illinois. The Station is jointly owned by Commonwealth Edison Company and Iowa-Illinois Gas & Electric Company. The Nuclear Steam Supply Systems are General Electric Company Boiling Water Reactors. The Architect/Engineer was Sargent & Lundy, Incorporated, and the primary construction contractor was United Engineers & Constructors. The Mississippi River is the condenser cooling water source. The plant is subject to license numbers DPR-29 and DPR-30, issued October 1, 1971, and March 21, 1972, respectively; pursuant to Docket Numbers 50-254 and 50-265. The date of initial Reactor criticalities for Units One and Two, respectively were October 18, 1971, and April 26, 1972. Commercial generation of power began on February 18, 1973 for Unit One and March 10, 1973 for unit Two.

This report was compiled by Matt Benson and Debra Kelley, telephone number 309-654-2241, extensions 2995 and 2240.

## II. SUMMARY OF OPERATING EXPERIENCE

### A. Unit One

Quad Cities Unit One began the month of December 1993 shutdown while a leak was repaired on the Reactor Vessel Level Instrument System. The reactor was made critical at 10:25 hours on December 1 and the generator was synchronized to the grid at 05:05 hours on December 2, 1993.

A few load drops were performed for the System Power Supply Office but none caused the average daily unit power level to drop by 20% or greater.

Unit One turbine tripped and reactor scrammed, on December 16 at 23:55 hours, when a relay failed in the EHC logic system. It was decided to leave the unit off line and perform additional maintenance on the Unit.

The maintenance outage was exited on December 30 when Unit One was made critical at 22:19 hours. Trouble with the scoop tube on the motor generator set and a solenoid in the EHC system caused the generator to remain off line past the end of December.

### B. Unit Two

Quad Cities Unit Two began the month of December 1993 at full power. An invalid low reactor water level signal caused an automatic SCRAM at 16:19 hours on December 2, 1993. The unit trip was caused by a pressure spike in the common tapped sensing line during a quarterly reactor high pressure SCRAM calibration and functional test. Foreign material in an isolation valve was one of the factors leading to this event. It was decided to leave the unit off line and enter the maintenance outage scheduled for December 6. The maintenance outage continued through the end of December.

III. PLANT OR PROCEDURE CHANGES, TESTS, EXPERIMENTS,  
AND SAFETY RELATED MAINTENANCE

A. Amendments to Facility License or Technical Specifications

There were no Amendments to the Facility License or Technical Specifications for the reporting period.

B. Facility or Procedure Changes Requiring NRC Approval

There were no Facility or Procedure changes requiring NRC approval for the reporting period.

Revision 1.0 to the Generic Sections of the Offsite Dose Calculation Manual (ODCM) was Onsite Reviewed and accepted on December 15, 1993. The revision changed chapters 1, 2, 3, 4, 5, 6, 7, 8, 9, references and Appendix A, B, C, D, E. This revision incorporates changes based on the new 10CFR20 which will become effective on January 1, 1994. The change is documented in onsite review report Number 93-44 and all affected pages were transmitted to the NRC by Emergency Preparedness on December 29, 1993.

Revision 1.0 to the site specific sections of the Offsite Dose Calculation Manual (ODCM) was Onsite Reviewed and accepted on December 16, 1993. The revision changed chapters 10, 11, 12 and Appendix F. This revision incorporates changes based on the new 10CFR20 which will become effective on January 1, 1994. The change is documented in onsite review report number 93-44 and all effected pages were transmitted to the NRC by Emergency Preparedness on December 29, 1993.

C. Tests and Experiments Requiring NRC Approval

There were no Tests or Experiments requiring NRC approval for the reporting period.

D. Corrective Maintenance of Safety Related Equipment

The following represents a tabular summary of the major safety related maintenance performed on Units One and Two during the reporting period. This summary includes the following: Work Request Numbers, Licensee Event Report Numbers, Components, Cause of Malfunctions, Results and Effects on Safe Operation, and Action Taken to Prevent Repetition.

UNIT 1 & 1/2 MAINTENANCE SUMMARY

NWR#	SYSTEM	EPN#	WORK REQUESTED	WORK PERFORMED
Q06389	263	1-0263-111D	Repair reactor vessel pressure switch.	Found gasket on switch cracked and broken. Replaced gasket.
Q08258	202	1-0202-6A	Replace handwheel on recirc cross-tie valve.	Installed new handwheel and key.
Q08882	1000	1-1001-90C	Investigate/repair internal leakage of drywell pressure switch isolation valve.	Replaced isolation valve with a new one.
Q09319	6600	1-6657	Repair/replace diesel generator lube oil circ pump motor.	Replaced motor and rewired.
Q09589	6600	1-6601	Repair oil leak around the switch well.	Cleaned fitting, applied permatex, and reinstalled.
Q11489	203	1-0203-3C	Repair electromatic position indicator.	Replaced control switch and limit switch.
Q11598	6600	1-6601	Replace brittle wire on emergency diesel generator power on light panel.	Replaced wire with new.
Q11764	1100	1-1165	Repair/replace standby liquid control pump suction temperature switch.	Installed new temperature switch.
Q11917	5700	1/2-5749	Investigate/repair DG cooling water pump room cooler-fan will not run.	Found dirt, metal shavings, and plastic pieces inside alternate contactor of fan motor. Cleaned motor, reassembled, and returned it to service.

Q11948	1000	1-1001-34B	Troubleshoot/repair tripped thermals on 1B torus spray/cooling stop valve limitorque.	Replaced air valve, worm gear, worm, worm shaft, and motor.
Q11992	6600	1-6601	During diesel generator mod test, ER relay shorted to FSR relay-repair.	Installed new lugs and relanded wire.
Q12036	2000	1-2001-15	Investigate/repair valve sticking.	Replaced solenoid valve on operator.
Q12053	1000	1-1001-65C	Investigate/repair if necessary 1C RHR service water pump inlet bearing high temperature.	Installed a pipe plug in place of the external sight glass.



UNIT 2 MAINTENANCE SUMMARY

NWR #	SYSTEM	EPN#	WORK REQUESTED	WORK PERFORMED
None				

#### IV. LICENSEE EVENT REPORTS

The following is a tabular summary of all licensee event reports for Quad-Cities Units One and Two occurring during the reporting period, pursuant to the reportable occurrence reporting requirements as set forth in sections 6.6.B.1 and 6.6.B.2 of the Technical Specifications.

##### UNIT 1

<u>Licensee Event Report Number</u>	<u>Date</u>	<u>Title of occurrence</u>
93-023	12-17-93	Rx Scram on apparent low condenser vacuum.

##### UNIT 2

<u>Licensee Event Report Number</u>	<u>Date</u>	<u>Title of occurrence</u>
93-023	12-09-93	U2 and 1/2 Diesel Generator operability.
93-024	12-02-93	Rx Scram from Low Level.
93-025	12-05-93	Failed LLRT on "A" Loop MSIV.
93-026	12-24-93	Invalid Low Level Rx Scram.

## V. DATA TABULATIONS

The following data tabulations are presented in this report:

- A. Operating Data Report
- B. Average Daily Unit Power Level
- C. Unit Shutdowns and Power Reductions

APPENDIX C

OPERATING DATA REPORT

DOCKET NO. 50-254

UNIT One

DATE January 5, 1993

COMPLETED BY Matt Benson

TELEPHONE (309) 654-2241

OPERATING STATUS

0000 120193

1. REPORTING PERIOD: 2400 123193 GROSS HOURS IN REPORTING PERIOD: 744

2. CURRENTLY AUTHORIZED POWER LEVEL (MWe): 2511 MAX > DEPEND > CAPACITY: 769  
DESIGN ELECTRICAL RATING (MWe-NET): 789

3. POWER LEVEL TO WHICH RESTRICTED (IF ANY) (MWe-Net): N/A

4. REASONS FOR RESTRICTION (IF ANY):

	THIS MONTH	YR TO DATE	CUMULATIVE
5. NUMBER OF HOURS REACTOR WAS CRITICAL	399.20	7020.40	149781.30
6. REACTOR RESERVE SHUTDOWN HOURS	0.00	0.00	3421.90
7. HOURS GENERATOR ON LINE	344.80	6894.70	145286.30
8. UNIT RESERVE SHUTDOWN HOURS	0.00	0.00	909.20
9. GROSS THERMAL ENERGY GENERATED (MWH)	770232.50	16111363.40	313693187.20
10. GROSS ELECTRICAL ENERGY GENERATED (MWH)	253978.00	5279029.00	101698119.00
11. NET ELECTRICAL ENERGY GENERATED (MWH)	239907.00	5042486.00	95917998.00
12. REACTOR SERVICE FACTOR	53.66	80.14	78.66
13. REACTOR AVAILABILITY FACTOR	53.66	80.14	80.46
14. UNIT SERVICE FACTOR	46.34	78.71	76.30
15. UNIT AVAILABILITY FACTOR	46.34	78.71	76.78
16. UNIT CAPACITY FACTOR (Using MDC)	41.93	74.85	65.50
17. UNIT CAPACITY FACTOR (Using Design MWe)	40.87	72.96	63.84
18. UNIT FORCED OUTAGE RATE	53.02	15.41	6.32

19. SHUTDOWNS SCHEDULED OVER NEXT 6 MONTHS (TYPE, DATE, AND DURATION OF EACH):

20. IF SHUTDOWN AT END OF REPORT PERIOD < ESTIMATED DATE OF STARTUP: \_\_\_\_\_

21. UNITS IN TEST STATUS (PRIOR TO COMMERCIAL OPERATION):

	FORECAST	ACHIEVED	
INITIAL CRITICALITY			
INITIAL ELECTRICITY			
COMMERCIAL OPERATION			

APPENDIX C

OPERATING DATA REPORT

DOCKET NO. 50-265

UNIT Two

DATE: January 5, 1993

COMPLETED BY Matt Benson

TELEPHONE (309) 654-2241

OPERATING STATUS

0000 120193

1. REPORTING PERIOD: 2400 123193 GROSS HOURS IN REPORTING PERIOD: 744

2. CURRENTLY AUTHORIZED POWER LEVEL (MWe): 2511 MAX > DEPEND > CAPACITY: 769  
DESIGN ELECTRICAL RATING (MWe-NET): 789

3. POWER LEVEL TO WHICH RESTRICTED (IF ANY) (MWe-Net): N/A

4. REASONS FOR RESTRICTION (IF ANY):

	THIS MONTH	YR TO DATE	CUMULATIVE
5. NUMBER OF HOURS REACTOR WAS CRITICAL	40.30	4725.80	143901.05
6. REACTOR RESERVE SHUTDOWN HOURS	0.00	0.00	2905.30
7. HOURS GENERATOR ON LINE	40.30	4541.70	140183.15
8. UNIT RESERVE SHUTDOWN HOURS	0.00	0.00	702.90
9. GROSS THERMAL ENERGY GENERATED (MWH)	96409.90	10117552.70	302780961.90
10. GROSS ELECTRICAL ENERGY GENERATED (MWH)	31785.00	3284509.00	97309770.00
11. NET ELECTRICAL ENERGY GENERATED (MWH)	24570.00	3111817.00	92142560.00
12. REACTOR SERVICE FACTOR	5.42	53.95	76.20
13. REACTOR AVAILABILITY FACTOR	5.42	53.95	77.78
14. UNIT SERVICE FACTOR	5.42	51.85	74.23
15. UNIT AVAILABILITY FACTOR	5.42	51.85	74.60
16. UNIT CAPACITY FACTOR (Using MDC)	4.29	46.19	63.45
17. UNIT CAPACITY FACTOR (Using Design MWe)	4.19	45.02	61.84
18. UNIT FORCED OUTAGE RATE	66.42	26.46	8.53

19. SHUTDOWNS SCHEDULED OVER NEXT 6 MONTHS (TYPE, DATE, AND DURATION OF EACH):

20. IF SHUTDOWN AT END OF REPORT PERIOD < ESTIMATED DATE OF STARTUP:

21. UNITS IN TEST STATUS (PRIOR TO COMMERCIAL OPERATION):

	FORECAST	ACHIEVED	
INITIAL CRITICALITY			
INITIAL ELECTRICITY			
COMMERCIAL OPERATION			

APPENDIX B  
AVERAGE DAILY UNIT POWER LEVEL

DOCKET NO 50-254  
UNIT One  
DATE January 5, 1993  
COMPLETED BY Matt Benson  
TELEPHONE (309) 654-2241

MONTH December 1993

DAY AVERAGE DAILY POWER LEVEL  
(MWe-Net)

DAY AVERAGE DAILY POWER LEVEL  
(MWe-Net)

1.           - 8            
2.           29            
3.           304            
4.           665            
5.           749            
6.           728            
7.           769            
8.           772            
9.           770            
10.           761            
11.           761            
12.           763            
13.           768            
14.           760            
15.           769            
16.           753          

17.           - 7            
18.           - 7            
19.           - 6            
20.           - 7            
21.           - 7            
22.           - 8            
23.           - 8            
24.           - 8            
25.           - 9            
26.           - 9            
27.           - 8            
28.           - 8            
29.           - 8            
30.           - 9            
31.           - 8          

INSTRUCTIONS

On this form, list the average daily unit power level in MWe-Net for each day in the reporting month. Compute to the nearest whole megawatt. These figures will be used to plot a graph for each reporting month. Note that when maximum dependable capacity is used for the net electrical rating of the unit, there may be occasions when the daily average power level exceeds the 100% line (or the restricted power level line). In such cases, the average daily unit power output sheet should be footnoted to explain the apparent anomaly.

APPENDIX B  
AVERAGE DAILY UNIT POWER LEVEL

DOCKET NO 50-265  
UNIT Two  
DATE January 5, 1993  
COMPLETED BY Matt Benson  
TELEPHONE (309) 654-2241

MONTH December 1993

DAY AVERAGE DAILY POWER LEVEL  
(MWe-Net)

DAY AVERAGE DAILY POWER LEVEL  
(MWe-Net)

1. 754  
2. 505  
3. - 9  
4. - 8  
5. - 8  
6. - 8  
7. - 8  
8. - 8  
9. - 8  
10. - 8  
11. - 8  
12. - 8  
13. - 8  
14. - 8  
15. - 8  
16. - 8

17. - 8  
18. - 7  
19. - 7  
20. - 7  
21. - 7  
22. - 8  
23. - 8  
24. - 8  
25. - 8  
26. - 8  
27. - 8  
28. - 8  
29. - 8  
30. - 8  
31. - 8

INSTRUCTIONS

On this form, list the average daily unit power level in MWe-Net for each day in the reporting month. Compute to the nearest whole megawatt. These figures will be used to plot a graph for each reporting month. Note that when maximum dependable capacity is used for the net electrical rating of the unit, there may be occasions when the daily average power level exceeds the 100% line (or the restricted power level line). In such cases, the average daily unit power output sheet should be footnoted to explain the apparent anomaly.







## VI. UNIQUE REPORTING REQUIREMENTS

The following items are included in this report based on prior commitments to the commission:

### A. Main Steam Relief Valve Operations

Relief valve operations during the reporting period are summarized in the following table. The table includes information as to which relief valve was actuated, how it was actuated, and the circumstances resulting in its actuation.

Unit: One

Date: December 2, 1993

Valve Actuated:                    No. & Type of Actuation:

1-203-3D                                1 Manual

Plant Conditions: Reactor Pressure - 922 psig

Description of Events: PMVT for Work Package

### B. Control Rod Drive Scram Timing Data for Units One and Two

The basis for reporting this data to the Nuclear Regulatory Commission are specified in the surveillance requirements of Technical Specifications 4.3.C.1 and 4.3.C.2.

The following table is a complete summary of Units One and Two Control Rod Drive Scram timing for the reporting period. All scram timing as performed with reactor pressure greater than 800 PSIG.

RESULTS OF SCRAM TIMING MEASUREMENTS  
 PERFORMED ON UNIT 1 & 2 CONTROL  
 ROD DRIVES, FROM 01/01/93 TO 12/31/93

DATE	NUMBER OF RODS	AVERAGE TIME IN SECONDS AT % INSERTED FROM FULLY WITHDRAWN				MAX. TIME FOR 90% INSERTION	DESCRIPTION
		5 0.375	20 0.900	50 2.00	90 3.5		
01-28-93	1	0.30	0.67	1.42	2.15	H-12 2.15	For Accumulator Replacement
02-12-93	1	0.33	0.72	1.54	2.77	D-5 2.77	Accumulator Replacement U2 Q05404
02-26-93	1	0.32	0.69	1.46	2.61	K-7 2.61	Scram Inlet Valve U2 Q05593
05-28-93	177	0.32	0.705	1.49	2.60	D-9 3.47	U2 Start Up Scram Timing Q2R12
07-13-93	4	0.33	0.73	1.51	2.60	D-9 2.69	For WR Test Q08085 Q07146 U2 Q08364 Q07147
07-23-93	90	0.31	0.69	1.45	2.53	D-8 3.4	U1 SEQA & Q08229
07-29-93	1	0.32	0.71	1.51	2.66	F-10 2.66	U2 Q08629 Accumulator
08-07-93	1	0.28	0.64	1.37	2.39	F-15 2.39	U1 Q09059 Scram Solenoid
08-19-93	1	0.28	0.60	1.26	2.19	A-8 2.19	U1 Q09374 Diaphragm
09-24-93	1	0.32	0.68	1.41	2.46	C-11 2.46	U2 Q08627 Accumulator
10-23-93	1	0.34	0.71	1.45	2.51	D-4 2.51	U1 Q11022 Scram Valve
10-28-93	1	0.28	0.65	1.42	2.52	J-12 2.52	U1 Q11231, Q11151 2 WR 1 CRD
12-04-93	113	0.30	0.68	1.46	2.56	R-6 3.14	U1 SEQ B & WR from Maintenance Outage

VII. REFUELING INFORMATION

The following information about future reloads at Quad-Cities Station was requested in a January 26, 1978, licensing memorandum (78-24) from D. E. O'Brien to C. Reed, et al., titled "Dresden, Quad-Cities and Zion Station--NRC Request for Refueling Information", dated January 18, 1978.

QUAD CITIES REFUELING  
INFORMATION REQUEST

1. Unit: Q1 Reload: 12 Cycle: 13
2. Scheduled date for next refueling shutdown: 3-12-94
3. Scheduled date for restart following refueling: 7-2-94
4. Will refueling or resumption of operation thereafter require a Technical Specification change or other license amendment:  
YES. Safety Limit MCPR to be changed from 1.06 to 1.07 due to GE10 Fuel.
5. Scheduled date(s) for submitting proposed licensing action and supporting information:  
11-19-93
6. Important licensing considerations associated with refueling, e.g., new or different fuel design or supplier, unreviewed design or performance analysis methods, significant changes in fuel design, new operating procedures:  
160 GE10 Fuel Bundles will be loaded during Q1R13.
7. The number of fuel assemblies.
  - a. Number of assemblies in core: 724
  - b. Number of assemblies in spent fuel pool: 1557
8. The present licensed spent fuel pool storage capacity and the size of any increase in licensed storage capacity that has been requested or is planned in number of fuel assemblies:
  - a. Licensed storage capacity for spent fuel: 3657
  - b. Planned increase in licensed storage: 0
9. The projected date of the last refueling that can be discharged to the spent fuel pool assuming the present licensed capacity: 2009

QUAD CITIES REFUELING  
INFORMATION REQUEST

QTP 300-S32  
Revision 2  
October 1989

1. Unit: Q2 Reload: 12 Cycle: 13
2. Scheduled date for next refueling shutdown: 09-24-94
3. Scheduled date for restart following refueling: 12-04-94
4. Will refueling or resumption of operation thereafter require a Technical Specification change or other license amendment:  
YES - Safety limit MCPR to be changed from 1.06 to 1.07 due to GE10 Fuel.
5. Scheduled date(s) for submitting proposed licensing action and supporting information:  
5-13-94
6. Important licensing considerations associated with refueling, e.g., new or different fuel design or supplier, unreviewed design or performance analysis methods, significant changes in fuel design, new operating procedures:  
GE10 Fuel will be loaded during Q2R13.
7. The number of fuel assemblies.
  - a. Number of assemblies in core: 724
  - b. Number of assemblies in spent fuel pool: 2583
8. The present licensed spent fuel pool storage capacity and the size of any increase in licensed storage capacity that has been requested or is planned in number of fuel assemblies:
  - a. Licensed storage capacity for spent fuel: 3897
  - b. Planned increase in licensed storage: 0
9. The projected date of the last refueling that can be discharged to the spent fuel pool assuming the present licensed capacity: 2009

## VIII. GLOSSARY

The following abbreviations which may have been used in the Monthly Report, are defined below:

ACAD/CAM	- Atmospheric Containment Atmospheric Dilution/Containment Atmospheric Monitoring
ANSI	- American National Standards Institute
APRM	- Average Power Range Monitor
ATWS	- Anticipated Transient Without Scram
BWR	- Boiling Water Reactor
CRD	- Control Rod Drive
EHC	- Electro-Hydraulic Control System
EOF	- Emergency Operations Facility
GSEP	- Generating Stations Emergency Plan
HEPA	- High-Efficiency Particulate Filter
HPCI	- High Pressure Coolant Injection System
HRSS	- High Radiation Sampling System
IPCLRT	- Integrated Primary Containment Leak Rate Test
IRM	- Intermediate Range Monitor
ISI	- Inservice Inspection
LER	- Licensee Event Report
LLRT	- Local Leak Rate Test
LPCI	- Low Pressure Coolant Injection Mode of RHRS
LPRM	- Local Power Range Monitor
MAPLHGR	- Maximum Average Planar Linear Heat Generation Rate
MCPR	- Minimum Critical Power Ratio
MFLCPR	- Maximum Fraction Limiting Critical Power Ratio
MPC	- Maximum Permissible Concentration
MSIV	- Main Steam Isolation Valve
NIOSH	- National Institute for Occupational Safety and Health
PCI	- Primary Containment Isolation
PCOMR	- Preconditioning Interim Operating Management Recommendations
RBCCW	- Reactor Building Closed Cooling Water System
RBM	- Rod Block Monitor
RCIC	- Reactor Core Isolation Cooling System
RHRS	- Residual Heat Removal System
RPS	- Reactor Protection System
RWM	- Rod Worth Minimizer
SBGTS	- Standby Gas Treatment System
SBLC	- Standby Liquid Control
SDC	- Shutdown Cooling Mode of RHRS
SDV	- Scram Discharge Volume
SRM	- Source Range Monitor
TBCCW	- Turbine Building Closed Cooling Water System
TIP	- Traversing Incore Probe
TSC	- Technical Support Center