December 30, 1986

Docket No. 50-265

Mr. Dennis L. Farrar
Director of Nuclear Licensing
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Dear Mr. Farrar:

SUBJECT: TECHNICAL SPECIFICATION CHANGES FOR THE STANDBY LIQUID CONTROL SYSTEM MODIFICATIONS (TAC 63367)

Re: Quad Cities Nuclear Power Station, Unit 2

The Commission has issued the enclosed Amendment No. 93 to Facility Operating License No. DPR-30 for the Quad Cities Nuclear Power Station, Unit 2. The amendment is in response to your application dated October 28, 1986, to modify the Technical Specifications to reflect the modifications made to the Standby Liquid Control System for compliance with the requirements established in 10 CFR 50.62.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notices.

Sincerely,

Original signed by

John A. Zwolinski, Director
BWR Project Directorate #1
Division of BWR Licensing

Enclosures:
1. Amendment No. 93 to License No. DPR-30
2. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION

Docket File	CJamerson	BGrimes	OPA	TCollins
NRC PDR	TRotella	TBarnhart (4)	RDiggs	
Local PDR	OGC-BETH	WJones	JPartlow	
BWD#1 Reading	LJHarmon	DVassallo	EButcher	
RBernero	ELJordan	ACRS (10)	NThompson	
			JZwolinski	

DBL:BWD#1	DBL:BWD#1	OGC-BETH	DBL:BWD#1
CJamerson	TRotella:we		JZwolinski
12/16/86	12/16/86	12/18/86	12/30/86

cc:

Mr. B. C. O'Brien
President
Iowa-Illinois Gas and
Electric Company
206 East Second Avenue
Davenport, Iowa 52801

Mr. Michael I. Miller
Isham, Lincoln & Beale
Three First National Plaza
Suite 5200
Chicago, Illinois 60602

Mr. Nick Kalivianakis
Plant Superintendent
Quad Cities Nuclear Power Station
22710 - 206th Avenue - North
Cordova, Illinois 61242

Resident Inspector
U. S. Nuclear Regulatory Commission
22712 206th Avenue North
Cordova, Illinois 61242

Chairman
Rock Island County Board
of Supervisors
Rock Island County Court House
Rock Island, Illinois 61201

Mr. Michael E. Parker
Division of Engineering
Illinois Department of Nuclear Safety
1035 Outer Park Drive, 5th Floor
Springfield, Illinois 62704

Regional Administrator, Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

DOCKET NO. 50-265

QUAD CITIES NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 93
License No. DPR-30

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated October 28, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B. of Facility Operating License No. DPR-30 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 93, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

John A. Zwolinski, Director
BWR Project Directorate #1
Division of BWR Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 30, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 93

FACILITY OPERATING LICENSE NO. DPR-30

DOCKET NO. 50-265

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by the captioned amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
vi	vi
3.4/4.4-1	3.4/4.4-1
3.4/4.4-2	3.4/4.4-2
3.4/4.4-3	3.4/4.4-3
--	3.4/4.4-4
FIGURE 3.4-1	--

QUAD-CITIES
DPR-30

TECHNICAL SPECIFICATIONS

APPENDIX A

LIST OF FIGURES

3.4/4.4 STANDBY LIQUID CONTROL SYSTEM

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
Applicability:	Applicability:
Applies to the operating status of the standby liquid control system.	Applies to the periodic testing requirements for the standby liquid control system.
Objective:	Objective:
To assure the availability of an independent reactivity control mechanism.	To verify the operability of the standby liquid control system.

SPECIFICATIONS

A. Normal Operation	A. Normal Operation
During periods when fuel is in the reactor and prior to startup from a cold condition, the standby liquid control system shall be operable except as specified in Specification 3.4.B. This system need not be operable when the reactor is in the cold shutdown condition, all control rods are fully inserted, and Specification 3.3.A is met.	The operability of the standby liquid control system shall be verified by performance of the following tests: 1. At least once per month Demineralized water shall be recycled to the test tank. Pump minimum flow rate of 40 gpm shall be verified against a system head of 1275 psig. 2. At least once during each operating cycle Manually initiate the system, except the explosion valves and pump solution in the recirculation path, to demonstrate that the pump suction line from the storage tank is not plugged. Explode two of six charges or two of four charges manufactured in the same batch using the permanent system wiring to verify proper function. Then install the untested charges in the explosion valves. Demineralized water shall be injected via a test connection into the reactor vessel to test that valves (except explosion valves) not checked by the recirculation test are not clogged.

Test that the setting of the system pressure relief valves is between 1455 and 1545 psig.

3. Disassemble and inspect one explosion valve so that it can be established that the valve is not clogged. Both valves shall be inspected in the course of two operating cycles.

B. Operation with Inoperable Components

From and after the date that a redundant component is made or found to be inoperable, Specification 3.4.A shall be considered fulfilled and continued operation permitted provided that the component is returned to an operable condition within 7 days.

B. Operation with Inoperable Components

When a component becomes inoperable, its redundant component shall be demonstrated to be operable immediately and daily thereafter.

C. Liquid Poison Tank-Boron Concentration

The liquid poison tank shall contain a boron-bearing solution of at least 3321 gallons of at least 14 WT percent sodium pentaborate Decahydrate ($Na_2 B_{10} O_{16} - 10H_2O$) at all times when the standby liquid control system is required to be operable and the solution temperature shall not be less than the temperature presented in Figure 3.4-2.

C. Liquid Poison Tank-Boron Concentration

The availability of the proper boron-bearing solution shall be verified by performance of the following tests:

1. At least once per month

   Boron concentration shall be determined. In addition, the boron concentration shall be determined any time water or boron are added or if the solution temperature drops below the limits specified by Figure 3.4-2.

2. At least one per day

   Solution volume shall be checked.

3. At least once per day

   The solution temperature shall be checked.

D. If Specifications 3.4.A through C are not met, an orderly shutdown shall be initiated and the reactor shall be in the cold shutdown condition within 24 hours.

3.4 LIMITING CONDITIONS FOR OPERATION BASES

A. The design objective of the standby liquid control system is to provide the capability of bringing the reactor from full power to a cold, xenon-free shutdown assuming that none of the withdrawn control rods can be inserted. To meet this objective, the liquid control system is designed to inject a quantity of boron which produces a concentration of no less than 600 ppm of boron in the reactor core in approximately 83 minutes with imperfect mixing. A boron concentration of 600 ppm in the reactor core is required to bring the reactor from full power to 3% Δk or more subcritical condition considering the hot to cold reactivity swing, xenon poisoning and an additional margin in the reactor core for imperfect mixing of the chemical solution in the reactor water. A normal quantity of 3,321 gallons of solution having a 14% sodium pentaborate concentration is required to meet this shutdown requirement.

For a required pumping rate of 40 gpm, 3321 gallons of at least 14 WT percent solution will be inserted in approximately 83 minutes. This insertion rate of boron solution will override the rate of reactivity insertion due to cool down of the reactor following the zenon peak. Two pump operation will enable faster reactor shutdown for ATWS events. The monthly pump minimum flowrate test shall require a minimum flowrate of 40 gpm. This requirement, combined with the solution concentration requirement of at least 14 WT percent, will demonstrate that the Standby Liquid Control System meets the requirements of 10CFR50.62.

Boron concentration, solution temperature,, and volume are checked on a frequency to assure a high reliability of operation of the system should it ever be required. Experience with pump operability indicates that monthly testing is adequate to detect if failures have occurred.

The only practical time to test the standby liquid control system is during a refueling outage and by initiation from local stations. Components of the system are checked periodically as described above and make a functional test of the entire system on a frequency of less than once each refueling outage unnecessary. A test of explosive charges from one manufacturing batch is made to assure that the charges are satisfactory. A continual check of the firing circuit continuity is provided by pilot lights in the control room.

B. Only one of two standby liquid control pumping circuits is needed for proper operation of the system. If one pumping circuit is found to be inoperable, there is no immediate threat to shutdown capability, and reactor operation may continue while repairs are being made. Assurance that the remaining system will perform its intended function and that the reliability of the system is good is obtained by demonstrating operation of the pump in the operable circuit at least once daily. A reliability analysis indicates that the plant can be operated safely in this manner for 7 days.

C. The solution saturation temperature of 13% sodium pentaborate, by weight, is 59°F. The solution shall be kept at least 10°F above the saturation temperature to guard against boron precipitation. The 10°F margin is included in Figure 3.3-1. Temperature and liquid level alarms for the system are annunciated in the control room.

Pump operability is checked on a frequency to assure a high reliability of operation of the system should it ever be required.

Once the solution has been made up, boron concentration will not vary unless more boron or more water is added. Level indication and alarm indicate whether the solution volume has changed, which might indicate a possible solution concentration change. Considering these factors, the test interval has been established.

D. Periodic tests to demonstrate two-pump flow capability are not feasible in the present system configuration and are unnecessary because the flow path integrity can be determined from the test of a single pump. Comparison of single-pump test pressures with previous results and correlation of these data with initial two-pump tests are used to verify the capability of the piping.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 93 TO FACILITY OPERATING LICENSE NO. DPR-30

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNIT 2

DOCKET NO. 50-265

1.0 INTRODUCTION

By letter dated October 28, 1986, the licensee for Quad Cities Nuclear Power Station, Unit 2, requested changes to the technical specifications with regard to the Standby Liquid Control System (SLCS). The proposed changes reflect the licensee's plan to increase the concentration of sodium pentaborate in the SLCS tank to 14 weight percent. This increase in concentration in conjunction with the capability to operate both SLCS pumps simultaneously at a total combined flow rate of 80 gpm is proposed to satisfy, in part, the requirements of 10 CFR 50.62. The licensee also proposed a change to the minimum required liquid poison volume from 3470 gallons to 3321 gallons, and proposed to periodically test the SLCS pumps, one pump at a time.

2.0 EVALUATION

The changes proposed by the licensee have been reviewed by the staff against the requirements of the ATWS rule (10 CFR 50.62), and Generic Letter 85-03 "Clarification of Equivalent Control Capacity for Standby Liquid Control Systems" dated January 28, 1985. The licensee's proposed increase in sodium pentaborate concentration to 14 weight percent in conjunction with a flow rate of 80 gpm will provide a boron content equivalent in control capacity to 86 gpm of 13 weight percent sodium pentaborate. This is in compliance with 10 CFR 50.62 and is therefore acceptable.

The licensee's proposal that the liquid poison tank volume requirement be changed from a minimum of 3,470 gallons to a minimum 3,321 gallons is acceptable because at the increased solution concentration of 14 weight percent, 3,321 gallons provide the same total amount of poison and shut-down margin as the lower concentration/higher volume solution currently used.

The licensee's proposal to periodically test only one SLCS system pump at a time instead of both pumps simultaneously is also acceptable. This is based upon the licensee's plan to perform initial two-pump tests, correlate single pump data to the initial two-pump data, and then compare the periodic single pump test data to the initial test data for verification of system capability.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20, and changes to the surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement nor environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The technical specification changes proposed by the licensee are acceptable because they are consistent with the requirements of 10 CFR 50.62. Furthermore we have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: T. Collins, T. Rotella

Dated: December 30, 1986