June 23, 1988

Docket Nos.: 50-254
and 50-265

DISTRIBUTION

Docket	JPartlow
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DHagan	PDIII-2 Plant File
EJordan	

Mr. Henry E. Bliss
Nuclear Licensing Manager
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

Dear Mr. Bliss:

SUBJECT: LOW-LOW REACTOR WATER LEVEL SETPOINT TECHNICAL SPECIFICATION AMENDMENT (TAC NOS. 67044 AND 67045)

The Commission has issued enclosed Amendment Nos.109 and 105 to Facility Operating License DPR-29 and DPR-30 for the Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. These Technical Specification amendments are in response to your application, dated January 29, 1988, to delete the upper tolerance of the Reactor Low-Low Water Level setpoint and correct typographical errors in the bases.

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

Sincerely,

Thierry Ross, Project Manager
Project Directorate III-2
Division of Reactor Projects - III, IV, V and Special Projects

Enclosures:
1. Amendment No. 109 to License No. DPR-29
2. Amendment No 105 to License No. DPR-30
3. Safety Evaluation

cc: w/enclosures:
See next page

PDIII-2:PM	PDIII-2:LA	PDIII-2:PD	SRXB	OGC
TRoss:cdd/R	LLuther	LNorrholm	WHodges	RBachmann
6/13/88	6/15/88	6/14/88	6/14/88	6/16/88

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

June 23, 1988

Docket Nos.: 50-254
and 50-265

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Nuclear Licensing Manager
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60690

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SUBJECT: LOW-LOW REACTOR WATER LEVEL SETPOINT TECHNICAL SPECIFICATION AMENDMENT (TAC NOS. 67044 AND 67045)

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Division of Reactor Projects - III,
IV, V and Special Projects

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1. Amendment No. 109 to
License No. DPR-29
2. Amendment No 105 to
License No. DPR-30
3. Safety Evaluation

cc: w/enclosures:
See next page

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U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
June 23, 1988

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

DOCKET NO. 50-254

QUAD CITIES NUCLEAR POWER STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 109
License No. DPR-29

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

   A. The application for amendment by Commonwealth Edison Company (the licensee) dated January 29, 1988, 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 by this amendment can be conducted without endangering the health 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-29 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A and B, as revised through Amendment No.109, 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

Leif J. Norrholm, Acting Director
Project Directorate III-2
Division of Reactor Projects - III,
IV, V and Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 23, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 109

FACILITY OPERATING LICENSE NO. DPR-29

DOCKET NO. 50-254

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
1.1/2.1-2a	1.1/2.1-2a
3.2/4.2-5a	3.2/4.2-5a
3.2/4.2-12	3.2/4.2-12

The definitions used above for the APRM scram trip apply. In the event of operation with a maximum fraction limiting power density (MFLPD) greater than the fraction of rated power (FRP), the setting shall be modified as follows:

$$S \leq (.58W_D + 50) \frac{FRP}{MFLPD}$$

The definitions used above for the APRM scram trip apply.

The ratio of FRP to MFLPD shall be set equal to 1.0 unless the actual operating value is less than 1.0, in which case the actual operating value will be used.

This may also be performed by increasing the APRM gain by the inverse ratio, MFLPD/FRP, which accomplishes the same degree of protection as reducing the trip setting by FRP/MFLPD.

C. Reactor low water level scram setting shall be 144 inches above the top of the active fuel* at normal operating conditions.

D. Reactor low water level ECCS initiation shall be $\geq$ 84 inches above the top of the active fuel* at normal operating conditions.

E. Turbine stop valve scram shall be $\leq$ 10% valve closure from full open.

F. Turbine control valve fast closure scram shall initiate upon actuation of the fast closure solenoid valves which trip the turbine control valves.

G. Main steamline isolation valve closure scram shall be $\leq$ 10% valve closure from full open.

H. Main steamline low-pressure initiation of main steamline isolation valve closure shall be $\geq$ 825 psig.

*Top of active fuel is defined to be 360 inches above vessel zero (See Bases 3.2).

3.2 LIMITING CONDITION FOR OPERATION BASES

In addition to reactor protection instrumentation which initiates a reactor scram, protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the operator's ability to control, or terminates operator errors before they result in serious consequences. This set of specifications provides the limiting conditions of operation for the primary system isolation function, initiation of the emergency core cooling system, control rod block and standby gas treatment systems. The objectives of the specifications are (1) to assure the effectiveness of the protective instrumentation when required by preserving its capability to tolerate a single failure of any component of such systems even during periods when portions of such systems are out of service for maintenance and (2) to prescribe the trip settings required to assure adequate performance. When necessary, one channel may be made inoperable for brief intervals to conduct required functional tests and calibrations. Some of the settings on the instrumentation that initiates or controls core and containment cooling have tolerances explicitly stated where the high and low values are both critical and may have a substantial effect on safety. It should be noted that the setpoints of other instrumentation, where only the high or low end of the setting has a direct bearing on safety, are chosen at a level away from the normal operating range to prevent inadvertent actuation of the safety system involved and exposure to abnormal situations.

Isolation valves are installed in those lines that penetrate the primary containment and must be isolated during a loss-of-coolant accident so that the radiation dose limits are not exceeded during an accident condition. Actuation of these valves is initiated by the protective instrumentation which serves the condition for which isolation is required (this instrumentation is shown in Table 3.2.1). Such instrumentation must be available whenever primary containment integrity is required. The objective is to isolate the primary containment so that the guidelines of 10 CFR 100 are not exceeded during an accident.

The instrumentation which initiates primary system isolation is connected in a dual bus arrangement. Thus the discussion given in the basis for Specification 3.1 is applicable here.

The low reactor level instrumentation is set to trip at > 8 inches on the level instrument (top of active fuel is defined to the 360 inches above vessel zero) and after allowing for the full power pressure drop across the steam dryer the low-level trip is at 504 inches above vessel zero, or 144 inches above the top of active fuel. Retrofit 8x8 fuel has an active fuel length 1.24 inches longer than earlier fuel designs. However, present trip setpoints were used in the LOCA analyses*. This trip initiates closure of Group 2 and 3 primary containment isolation valves but does not trip the recirculation pumps (reference SAR Section 7.7.2). For a trip setting of 504 inches above vessel zero and a 60-second valve closure time, the valves will be closed before perforation of the cladding occurs even for the maximum break: the setting is therefore adequate.

The low low reactor level instrumentation is set to trip when reactor water level is $\geq$ 444 inches above vessel zero (with top of active fuel defined as 360 inches above vessel zero, -59 inches is 84 inches above the top of active fuel). This trip initiates closure of Group 1 primary containment isolation valves (reference SAR Section 7.7.2.2) and also activates the ECC subsystems, starts the emergency diesel generator, and trips the recirculation pumps. This trip setting level was chosen to be low enough to prevent spurious operation but high enough to initiate ECCS operation and primary system isolation so that no melting of the fuel cladding will occur and so that postaccident cooling can be accomplished and the guidelines of 10 CFR 100 will not be exceeded. For the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, ECCS initiation and primary isolation are initiated and in time to meet the above criteria. The instrumentation also covers the full spectrum of breaks and meets the above criteria.

The high-drywell pressure instrumentation is a backup to the water level instrumentation and, in addition to initiating ECCS, it causes isolation of Group 2 isolation valves. For the breaks discussed above, this instrumentation will initiate ECCS operation at about the same time as the low low water level instrumentation; thus the results given above are applicable here also. Group 2 isolation valves include the drywell vent, purge and sump isolation valves. High-drywell pressure activates only these valves because high drywell pressure could occur as the result of non-safety-related causes such as not purging the drywell air during start-up. Total system isolation is not desirable for these conditions, and only the valves in Group 2 are required to close. The low low water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes a trip of Group 1 primary system isolation valves.

* Loss of coolant accident analysis for Dresden Units 2 & 3 and Quad Cities Units 1 & 2, NEDO-24146A, April, 1979

TABLE 3.2-2

INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND CONTAINMENT COOLING SYSTEMS

Minimum Number of Operable or Tripped Instrument Channels[1]	Trip Function	Trip Level Setting	Remarks
4	Reactor low low water level	≥84 inches above top of active fuel*	1. In conjunction with low-reactor pressure initiates core spray and LPCI. 2. In conjunction with high-drywell pressure 120-second time delay and low-pressure core cooling interlock initiates auto blowdown. 3. Initiates HPCI and RCIC. 4. Initiates starting of diesel generators.
4[4]	High-drywell pressure[2], [3]	≤2.5 psig	1. Initiates core spray, LPCI, HPCI, and SBGTS. 2. In conjunction with low low water level, 120-second time delay, and low-pressure core cooling interlock initiates auto blowdown. 3. Initiates starting of diesel generators. 4. Initiates isolation of control room ventilation.
2	Reactor low pressure	300 psig≤p≤350 psig	1. Permissive for opening core spray and LPCI admission valves. 2. In conjunction with low low reactor water level initiates core spray and LPCI.
	Containment spray interlock		Prevents inadvertent operation of containment spray during accident conditions.
2[3] 4[3]	2/3 core height containment high pressure	≥2/3 core height 0.5 psig≤p≤1.5 psig	
2	Timer auto blowdown	≤120 seconds	In conjunction with low low reactor water level, high-drywell pressure, and low-pressure core cooling interlock initiates auto blowdown.
4	Low-pressure core cooling pump discharge pressure	100 psig≤p≤150 psig	Defers APR actuation pending confirmation of low-pressure core cooling system operation.
2/BUS[5]	Undervoltage on emergency buses	3045 ± 5% volts	1. Initiates starting of diesel generators. 2. Permissive for starting ECCS pumps. 3. Removes nonessential loads from buses. 4. Bypasses degraded voltage timer.

* Top of active fuel is defined at 360" above vessel zero for all water levels used in the LOCA analysis

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. 105
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 January 29, 1988, 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 by this amendment can be conducted without endangering the health 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 Appendix A and B, as revised through Amendment No. 105 , are hereby incorporated in this 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

Leif J. Norrholm, Acting Director
Project Directorate III-2
Division of Reactor Projects - III,
IV, V and Special Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 23, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 105

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
1.1/2.1-2a	1.1/2.1-2a
3.2/4.2-5a	3.2/4.2-5a
3.2/4.2-12	3.2/4.2-12

The definitions used above for the APRM scram trip apply. In the event of operation with a maximum fraction limiting power density (MFLPD) greater than the fraction of rated power (FRP), the setting shall be modified as follows:

$$S \leq (.58W_D + 50) \frac{FRP}{MFLPD}$$

The definitions used above for the APRM scram trip apply.

The ratio of FRP to MFLPD shall be set equal to 1.0 unless the actual operating value is less than 1.0, in which case the actual operating value will be used.

This adjustment may also be performed by increasing the APRM gain by the inverse ratio, MFLPD/FRP, which accomplishes the same degree of protection as reducing the trip setting by FRP/MFLPD.

C. Reactor low water level scram setting shall be 144 inches above the top of the active fuel* at normal operating conditions.

D. Reactor low water level ECCS initiation shall be $\geq$ 84 inches above the top of the active fuel* at normal operating conditions.

E. Turbine stop valve scram shall be $\leq$ 10% valve closure from full open.

F. Turbine control valve fast closure scram shall initiate upon actuation of the fast closure solenoid valves which trip the turbine control valves.

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H. Main steamline low-pressure initiation of main steamline isolation valve closure shall be $\geq$ 825 psig.

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2	Reactor low pressure	300 psig≤p≤350 psig	1. Permissive for opening core spray and LPCI admission valves. 2. In conjunction with low low reactor water level initiates core spray and LPCI.
	Containment spray interlock		Prevents inadvertent operation of containment spray during accident conditions.
2[3] 4[3]	2/3 core height containment high pressure	≥2/3 core height 0.5 psig≤p≤1.5 psig	
2	Timer auto blowdown	≤120 seconds	In conjunction with low low reactor water level, high-drywell pressure, and low-pressure core cooling interlock initiates auto blow-down.
4	Low-pressure core cooling pump discharge pressure	100 psig≤p≤150 psig	Defers APR actuation pending confirmation of low-pressure core cooling system operation.
2/BUS[5]	Undervoltage on emergency buses	3045 ± 5% volts	1. Initiates starting of diesel generators. 2. Permissive for starting ECCS pumps. 3. Removes nonessential loads from buses. 4. Bypasses degraded voltage timer.

* Top of active fuel is defined at 360" above vessel zero for all water levels used in the LOCA analysis.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 109 TO FACILITY OPERATING LICENSE NO. DPR-29

AND AMENDMENT NO.105 TO FACILITY OPERATING LICENSE NO. DPR-30

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 50-265

1.0 INTRODUCTION

By letter dated January 29, 1988, Commomwealth Edison Company (CECo, the licensee) submitted an application to amend the Technical Specifications (TS) of the Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. This application proposed to delete the upper tolerance of the Reactor Low-Low Level Trip Setpoint and correct associated Limiting Condition for Operation (LCO) Bases.

2.0 EVALUATION

TS 2.1.D and Table 3.2-2 presently prescribe the trip level setting for Reactor Low-Low Water Level (i.e. safety limit setpoint for initiating core and containment cooling systems) as $\geq$ 84 inches above the top of active fuel, with a tolerance of plus 4 inches to minus zero. CECo has proposed to delete the setpoint tolerance because of difficulties in maintaining the setpoint calibration within the prescribed range. This kind of change is consistent with the general philosophy of TS for establishing setpoints in terms of limiting values rather than absolutes. Limiting TS setpoint values allow the licensee to develop appropriate instrument specific settings that accommodate drift and calibration uncertainties while assuring the limiting value will not be exceeded. Examples of other comparable TS setpoints which do not have established tolerances are the reactor low water level scram, main steam low-pressure isolation, high drywell pressure containment isolation, reactor low-low water level containment isolation, etc.

In essence, deletion of this setpoint tolerance will only eliminate the upper bounding limit of reactor vessel water level for initiating Emergency Core Cooling Systems (ECCS). The TS Bases do not assign any safety significance to an upper bounding tolerance. In fact, applicable Limiting Safety System Setting Bases state that "To raise the ECCS initiation setpoint would be in a safe direction." Although, the

primary purpose of an upper limit would be to prevent spurious actuations during normal operations or normally expected transients. In this instance the identified tolerance is overly prescriptive, from an instrument calibration standpoint, and does not have any specific safety significance. And, in any case, QCNPS surveillance procedures will provide guidance for controlling the Reactor Low-Low Water Level setpoint to assure the limiting value is not exceeded and sufficient margin remains to preclude inadvertent or spurious actuations. For these reasons, and those above, the proposed change to delete the +4/-0 tolerance for the Reactor Low-Low Water Level trip setpoint is acceptable.

CECo's application also proposed to revise portions of the TS Section 3.2 LCO Bases for consistency with the aforementioned setpoint change and to correct a typographical error. The words "high" and "low" were misplaced in a sentence which explain the Reactor Low-Low Water Level setting; CECo's application would interchange them into the proper narrative sequence. These TS changes are administrative in nature and therefore acceptable.

3.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to the use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined these amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendment involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these amendments meet 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 staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance 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 these amendments will not be inimical to the common defense and security nor the the health and safety of the public.

Principal Contributor: Thierry Ross

Dated: June 23, 1988