Docket Nos. 50-254/265 August 15, 1986

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

Dear Mr. Farrar:

SUBJECT: DRYWELL OXYGEN CONCENTRATION TECHNICAL SPECIFICATION CHANGES

Re: Quad Cities Nuclear Power Station, Units 1 and 2
(TAC Nos. 49196/7)

The Commission has issued the enclosed Amendment Nos. 96 and 92 to Facility Operating License Nos. DPR-29 and DPR-30 for the Quad Cities Nuclear Power Station, Units 1 and 2. The amendments are in response to your application dated November 1, 1982.

This amendment changes the drywell oxygen concentration upper limit from five percent by weight to four percent by volume.

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,

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

Enclosures:
1. Amendment No. 96 to License No. DPR-29
2. Amendment No. 92 to License No. DPR-30
3. Safety Evaluation

cc w/enclosures:
See next page

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

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. 96
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 November 1, 1982, 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 Appendices A and B, as revised through Amendment No. 96, 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: August 15, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 96

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
3.7/4.7-6	3.7/4.7-6
3.7/4.7-6a	3.7/4.7-6a
3.7/4.7-13	3.7/4.7-13

points along the seal surface of the disk.

3) The position alarm system will annunciate in the control room if the valve opening exceeds the equivalent of 1/16 inch at all points along the seal surface of the disk.

b. Any pressure-suppression chamber-drywell vacuum breaker may be non-fully closed as indicated by the position indication and alarm systems provided that drywell to suppression chamber differential pressure decay rate is demonstrated to be not greater than 25% of the differential pressure decay rate for all vacuum breakers open the equivalent of 1/16 inch at all points along the seal surface of the disk.

c. Reactor operation may continue provided that no more than one quarter of the number of pressure suppression chamber-drywell vacuum breakers are determined to be inoperable provided that they are secured or known to be in the closed position.

d. If failure occurs in one of the two-position alarm systems for one or more vacuum breakers, reactor operation may continue provided that a differential pressure decay rate test is initiated immediately and performed every 15 days thereafter until the failure is corrected. The test shall meet the requirements of Specification 3.7.A.4.b.

5. Oxygen Concentration

a. After completion of the startup test program and demonstration of plant electrical output, the primary containment atmosphere shall be reduced to less than 4% oxygen by volume with nitrogen gas during reactor power operation with reactor coolant pressure above 90 psig,

2) Vacuum breaker position indication and alarm systems shall be calibrated and functionally tested.

3) At least 25% of the vacuum breakers shall be inspected such that all vacuum breakers shall have been inspected following every fourth refueling outage. If deficiencies are found, all vacuum breakers shall be inspected and deficiencies corrected.

4) A drywell to suppression chamber leak test shall demonstrate that with initial differential pressure of not less than 1.0 psi, the differential pressure decay rate does not exceed the rate which would occur through a 1-inch orifice without the addition of air or nitrogen.

5. Oxygen Concentration

The primary containment oxygen concentration shall be measured and recorded on a weekly basis.

except as specified in Specification 3.7.A.5.b.

b. Within the 24-hour period subsequent to placing the reactor in the Run mode following a shutdown, the containment atmosphere oxygen concentration shall be reduced to less than 4% by volume, and maintained in this condition. Deinerting may commence 24 hours prior to a shutdown.

5. Containment Systems

Drywell-Suppression Chamber Differential Pressure

a. Differential pressure between the drywell and suppression chamber shall be maintained at equal to or greater than 1.20 psid except as specified in (1), (2), and (3) below:

(1) This differential shall be established within the 24 hour period subsequent to placing the reactor mode switch into the RUN mode during a startup and may be relaxed 24 hours prior to reactor shutdown when the provisions of 3.7.A.5(b) apply.

6. Containment Systems

Drywell-Suppression Chamber Differential Pressure

a. The pressure differential between the drywell and suppression chamber shall be recorded at least once each shift.

hydrogen, if it is present in sufficient quantities to result in excessively rapid recombination, could result in a loss of containment integrity.

The 4% oxygen concentration by volume minimizes the possibility of hydrogen combustion following a loss-of-coolant accident. Significant quantities of hydrogen could be generated if the core cooling system did not sufficiently cool the core. Providing an LCO by volume is consistent with the fact that the oxygen analyzer indicated in % oxygen by volume.

The occurrence of primary system leakage following a major refueling outage or other scheduled shutdown is much more probable than the occurrence of the loss-of-coolant accident upon which the specified oxygen concentration limit is based. Permitting access to the drywell for leak inspections during a startup is judged prudent in terms of the added plant safety offered without significantly reducing the margin of safety. Thus, to preclude the possibility of starting the reactor and operating for extended periods of time with significant leaks in the primary system, leak inspections are scheduled during startup periods, when the primary system is at or near rated temperature and pressure.

The 24-hour period to provide inerting is judged to be sufficient to perform the leak inspection and establish the required oxygen concentration. The primary containment is normally slightly pressurized during periods of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, no monitoring of oxygen concentration is necessary. However, at least once a week, the oxygen concentration will be determined as added assurance.

In conjunction with the Mark I Containment Short Term Program, a plant unique analysis was performed (Reference 5) which demonstrated a factor of safety of at least two for the weakest element in the suppression chamber support system and attached piping. The maintenance of a drywell-suppression chamber differential pressure of 1.20 psid and a suppression chamber water level corresponding to a downcomer submergence range of 3.21 to 3.54 feet will assure the integrity of the suppression chamber when subjected to post-LOCA suppression pool hydrodynamic forces.

B. Standby Gas Treatment System

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the chimney during secondary containment isolation conditions, with a minimum release of radioactive materials from the reactor building to the environs. One standby gas treatment system circuit is designed to automatically start upon containment isolation and to maintain the reactor building pressure at the design negative pressure so that all leakage should be in-leakage. Should one circuit fail to start, the redundant alternate standby gas treatment circuit is designed to start automatically. Each of the two circuits has 100% capacity. Only one of the two standby gas treatment system circuits is needed to cleanup the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is not immediate threat to the containment system performance. Therefore, reactor operation or refueling operation may continue while repairs are being made. If neither circuit is operable, the plant is placed in a condition that does not require a standby gas treatment system.

While only a small amount of particulates are released from the primary containment as a result of the loss-of-coolant accident, high-efficiency particulate filters before and after the charcoal filters are specified to minimize potential particulate release to the environment and to prevent clogging of the charcoal adsorbers. The

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. 92
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 November 1, 1982, 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. 92, 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: August 15, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 92

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
3.7/4.7-6	3.7/4.7-6
3.7/4.7-6a	3.7/4.7-6a
3.7/4.7-13	3.7/4.7-13

points along the seal surface of the disk.

3) The position alarm system will annunciate in the control room if the valve opening exceeds the equivalent of 1/16 inch at all points along the seal surface of the disk.

b. Any pressure-suppression chamber-drywell vacuum breaker may be non-fully closed as indicated by the position indication and alarm systems provided that drywell to suppression chamber differential pressure decay rate is demonstrated to be not greater than 25% of the differential pressure decay rate for all vacuum breakers open the equivalent of 1/16 inch at all points along the seal surface of the disk.

c. Reactor operation may continue provided that no more than one quarter of the number of pressure suppression chamber-drywell vacuum breakers are determined to be inoperable provided that they are secured or known to be in the closed position.

d. If failure occurs in one of the two-position alarm systems for one or more vacuum breakers, reactor operation may continue provided that a differential pressure decay rate test is initiated immediately and performed every 15 days thereafter until the failure is corrected. The test shall meet the requirements of Specification 3.7.A.4.b.

5. Oxygen Concentration

a. After completion of the startup test program and demonstration of plant electrical output, the primary containment atmosphere shall be reduced to less than 4% oxygen by volume with nitrogen gas during reactor power operation with reactor coolant pressure above 90 psig

2) Vacuum breaker position indication and alarm systems shall be calibrated and functionally tested.

3) At least 25% of the vacuum breakers shall be inspected such that all vacuum breakers shall have been inspected following every fourth refueling outage. If deficiencies are found, all vacuum breakers shall be inspected and deficiencies corrected.

4) A drywell to suppression chamber leak test shall demonstrate that with initial differential pressure of not less than 1.0 psi, the differential pressure decay rate does not exceed the rate which would occur through a 1-inch orifice without the addition of air or nitrogen.

5. Oxygen Concentration

The primary containment oxygen concentration shall be measured and recorded on a weekly basis.

except as specified in Specification 3.7.A.5.b.

b. Within the 24-hour period subsequent to placing the reactor in the Run mode following a shutdown, the containment atmosphere oxygen concentration shall be reduced to less than 4% by volume, and maintained in this condition. Deinerting may commence 24 hours prior to a shutdown.

6. Containment Systems

Drywell-Suppression Chamber Differential Pressure

a. Differential pressure between the drywell and suppression chamber shall be maintained at equal to or greater than 1.20 psid except as specified in (1), (2), and (3) below:

(1) This differential shall be established within the 24 hour period subsequent to placing the reactor mode switch into the RUN mode during a startup and may be relaxed 24 hours prior to reactor shutdown when the provisions of 3.7.A.5(b) apply.

(2) This differential may be decreased to less than 1.20 psid for a maximum of 4 hours during required operability testing of the HPCI system pump, the RCIC system pump, the drywell-pressure suppression chamber vacuum breakers, and reactor pressure relief valves.

6. CONTAINMENT SYSTEMS

Drywell-Suppression Chamber Differential Pressure

a. The pressure differential between the drywell and suppression chamber shall be recorded at least once each shift.

hydrogen, if it is present in sufficient quantities to result in excessively rapid recombination, could result in a loss of containment integrity.

The 4% oxygen concentration by volume minimizes the possibility of hydrogen combustion following a loss-of-coolant accident. Significant quantities of hydrogen could be generated if the core cooling system did not sufficiently cool the core. Providing an LCO by volume is consistent with the fact that the oxygen analyzer indicated in % oxygen by volume.

The occurrence of primary system leakage following a major refueling outage or other scheduled shutdown is much more probable than the occurrence of the loss-of-coolant accident upon which the specified oxygen concentration limit is based. Permitting access to the drywell for leak inspections during a startup is judged prudent in terms of the added plant safety offered without significantly reducing the margin of safety. Thus, to preclude the possibility of starting the reactor and operating for extended periods of time with significant leaks in the primary system, leak inspections are scheduled during startup periods, when the primary system is at or near rated temperature and pressure.

The 24-hour period to provide inerting is judged to be sufficient to perform the leak inspection and establish the required oxygen concentration. The primary containment is normally slightly pressurized during periods of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, no monitoring of oxygen concentration is necessary. However, at least once a week, the oxygen concentration will be determined as added assurance.

In conjunction with the Mark I Containment Short Term Program, a plant unique analysis was performed (Reference 5) which demonstrated a factor of safety of at least two for the weakest element in the suppression chamber support system and attached piping. The maintenance of a drywell-suppression chamber differential pressure of 1.20 psid and a suppression chamber water level corresponding to a downcomer submergence range of 3.21 to 3.54 feet will assure the integrity of the suppression chamber when subjected to post-LOCA suppression pool hydrodynamic forces.

B. Standby Gas Treatment System

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the chimney during secondary containment isolation conditions, with a minimum release of radioactive materials from the reactor building to the environs. One standby gas treatment system circuit is designed to automatically start upon containment isolation and to maintain the reactor building pressure at the design negative pressure so that all leakage should be in-leakage. Should one circuit fail to start, the redundant alternate standby gas treatment circuit is designed to start automatically. Each of the two circuits has 100% capacity. Only one of the two standby gas treatment system circuits is needed to cleanup the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is not immediate threat to the containment system performance. Therefore, reactor operation or refueling operation may continue while repairs are being made. If neither circuit is operable, the plant is placed in a condition that does not require a standby gas treatment system.

While only a small amount of particulates are released from the primary containment as a result of the loss-of-coolant accident, high-efficiency particulate filters before and after the charcoal filters are specified to minimize potential particulate release to the environment and to prevent clogging of the charcoal adsorbers. The

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 96 TO FACILITY OPERATING LICENSE NO. DPR-29

AND AMENDMENT NO. 92 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. 50-254/265

1.0 INTRODUCTION

By letter dated November 1, 1982, Commonwealth Edison Company (the licensee) proposed amendments to Appendix A, the Technical Specifications (TS), for Facility Operating License Nos. DPR-29 and DPR-30 of the Quad Cities Station, Units 1 and 2. The proposal would change the Containment System Limiting Condition for Operations (LCO) for the drywell oxygen concentration during startup and operational modes from five weight percent to four volume percent and the LCO bases to agree with the above changes. The proposal would also delete TS Section 3.7/4.7.A.5.c.

2.0 EVALUATION

In its submittal of November 1, 1982, the licensee proposed to change the drywell oxygen concentration limit from five weight percent to four volume percent. This change was proposed to maintain consistency between TS and a licensee analyses, submitted to NRC September 15, 1982, concerning combustible gas control for both the Quad Cities and Dresden facilities (this analyses concluded that these facilities rely on nitrogen inerting as the primary means of combustible gas control) and to change the TS oxygen concentration units to the same units (volume percent) as those provided by the Containment Oxygen Analyzer. The change concerns TS Sections 3.7/4.7 A.5.a and b, Pages 3.7/4.7-6 and 6a, Containment Systems LCO, and Section A of the LCO Bases on Page 3.7/4.7-13.

The staff has reviewed this change and agrees that the LCO change from five percent by weight (approximately 4.5 percent by volume) to 4.0 volume percent is a more conservative oxygen concentration limit and agrees with the concentration limit promulgated by Standard Technical Specifications (STS), NUREG-0123, Revision 3. It is also well within the oxygen concentration limit of Regulatory Guide 1.7, Revision 2, which requires the oxygen concentration to be less than five volume percent when the hydrogen concentration could exceed six volume percent. Therefore, the staff finds this change to be acceptable.

A temporary TS condition, effective during the interval January 14 to January 21, 1979, has been deleted from the Unit 1 TS. The time during which the condition was effective has long since passed, so the condition should be deleted from the current TS.

3.0 ENVIRONMENTAL CONSIDERATION

These amendments involve changes 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. The staff has determined that the amendments involve 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 these amendments 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 these amendments.

4.0 CONCLUSION

The staff has 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 the issuance of these amendments will not be inimical to the common defense and security nor to the health and safety of the public.

Principal Contributor: K. Ridgway

Dated: August 15, 1986

Document Name:
QC OXYGEN ISS NOTICE

Requestor's ID:
MARIGGIO

Author's Name:
R Bevan

Document Comments:
BWD- 1 quad cities 1/2 notice of issuance 11/1/82 appl.

August 15, 1986

Docket Nos. 50-~~254~~ 254/265

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Docket File
JZwolinski
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MEMORANDUM FOR: Sholly Coordinator

FROM: John A. Zwolinski, Director
BWR Project Directorate #1, DBL

SUBJECT: REQUEST FOR PUBLICATION IN BIWEEKLY FR NOTICE - NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY OPERATING LICENSES (TAC 49196/4919)

Commonwealth Edison Company, Docket Nos. 50-254 and 50-265, Quad Cities Nuclear Power Station, Units 1 and 2, Rock Island County, Illinois

Date of application for amendment: November 1, 1982

Brief description of amendment: This amendment changes the drywell oxygen concentration upper limit from five percent by weight to four percent by volume.

Date of issuance: August 15, 1986

Effective date: August 15, 1986

Amendment Nos.: 96, 92

Facility Operating License Nos. DPR-29 and DPR-30. Amendments revised the Technical Specifications.

Date of initial notice in Federal Register: September 21, 1983 (48 FR 43132).

The Commission's related evaluation of the amendment is contained in a Safety Evaluation dated August 15, 1986.

No significant hazards consideration comments received: No.

Local Public Document Room location: Moline Public Library, 504 - 17th Street, Moline, Illinois 61265.

John A. Zwolinski for
John A. Zwolinski, Director
BWR Project Directorate #1, DBL

OFC	:BWD-1:DBL	:LA:BWD-1:DBL:OGC	:D:BWD-1:DBL	:	:	:
NAME	:RBEVAN:gn	:CJAMERSON	:JZWOLINSKI	:	:	:
DATE	:7/29/86	:7/29/86	:7/8/86	:8/15/86	:	: