August 3, 1993

Docket Nos. 50-254
and 50-265

Mr. D. L. Farrar
Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III, Suite 500
1400 OPUS Place
Downers Grove, Illinois 60515

DISTRIBUTION:
NRC & Local PDRs
J. Roe
J. Dyer
C. Patel
D. Hagan
W. Jones
ACRS (10)
OC/LFDCB
B. Clayton RIII
Docket File
PDIII-2 p/f
J. Zwolinski
C. Moore
OGC
G. Hill (4)
C. Grimes
OPA
RJones

Dear Mr. Farrar:

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M86413 AND M86414)

The Commission has issued the enclosed Amendment No. 143 to Facility Operating License No. DPR-29 and Amendment No. 138 to Facility Operating License No. DPR-30 for the Quad Cities Nuclear Power Station, Units 1 and 2, respectively. The amendments are in response to your application dated May 18, 1993.

The proposed amendments would revise the basis of the scram and isolation setpoints for the main steamline radiation monitors as defined in NRC Safety Evaluations of January 18 and August 24, 1989. The proposed change would reduce the potential for unwarranted challenges to safety systems during a special test of the Hydrogen Water Chemistry (HWC).

These amendments are being issued pursuant to the requirements of 10 CFR 50.59(c) because the review by Commonwealth Edison Company identified the changes as an unreviewed safety question. No change to the Technical Specifications is required by these amendments.

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

Sincerely,

Original signed by:

Chandu P. Patel, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 143 to DPR-29
2. Amendment No. 138 to DPR-30
3. Safety Evaluation

NRC FILE CENTER COPY

cc w/enclosures:
See next page

060047

DF01

OFC	LA:PDIII-2	PM:PDIII-2	SRXB	D:PDIII-2	OGC
NAME	CMOORE	CPATEL	RJONES	JDYER	RBachmann
DATE	7/21/93	7/21/93	7/22/93	7/22/93	7/29/93

cc:

Mr. Stephen E. Shelton
Vice President
Iowa-Illinois Gas and
Electric Company
P. O. Box 4350
Davenport, Iowa 52808

Michael I. Miller, Esquire
Sidley and Austin
One First National Plaza
Chicago, Illinois 60690

Mr. Richard Bax
Station Manager
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
1504 3rd Avenue
Rock Island County Office Bldg.
Rock Island, Illinois 61201

Illinois Department of Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Regional Administrator, Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road, Bldg. #4
Glen Ellyn, Illinois 60137

Robert Neumann
Office of Public Counsel
State of Illinois Center
100 W. Randolph
Suite 11-300
Chicago, Illinois 60601

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 143
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 May 18, 1993, 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 being amended by the approval of the licensee's application dated May 18, 1993.

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

FOR THE NUCLEAR REGULATORY COMMISSION

James E. Dyer

James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Date of Issuance: August 3, 1993

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 138
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 May 18, 1993, 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 being amended by the approval of the licensee's application dated May 18, 1993.

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

FOR THE NUCLEAR REGULATORY COMMISSION

James E. Dyer

James E. Dyer, Director
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Date of Issuance: August 3, 1993

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 143 TO FACILITY OPERATING LICENSE NO. DPR-29

AND AMENDMENT NO. 138 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 of May 18, 1993, Commonwealth Edison Company (CECo, the licensee) requested an amendment to Facility Operating License Nos. DPR-29 and DRP-30 for Quad Cities Nuclear Power Station, Units 1 and 2. The proposed amendment would revise the basis of the scram and isolation setpoints for the main steamline radiation monitors (MSLRM) in order to eliminate the potential for unwarranted challenges to safety systems while conducting a stress corrosion monitoring (SCM) test on Quad Cities, Unit 2. The purpose of the test is to provide an in-core and in-pipe environmental evaluation for reactor component and recirculation system piping lifetime projections. The test will also optimize hydrogen injection rates for best plant performance.

The amendment is being issued pursuant to the requirements of 10 CFR 50.59(c) because the licensee identified the changes as an unreviewed safety question. No change to the technical specifications is required by this amendment.

2.0 BACKGROUND

By letters dated September 16 and September 28, 1988, the licensee proposed to increase the setpoint of MSLRM from 7 times Normal Full Power Background (NFPB) without hydrogen addition to 15 times NFPB without hydrogen addition to allow for implementation of Hydrogen Water Chemistry (HWC) which was expected to mitigate the effects of Intergranular Stress Corrosion Cracking (IGSCC). The MSLRM setpoint change was necessary since the injection of hydrogen into the feedwater lowers the oxidizing potential in the reactor coolant which in turn converts more N-16 to a volatile species and results in an increase in steamline radiation level. As a consequence, the NFPB steam activity during hydrogen addition can increase up to approximately a factor of 5 times greater than NFPB steam activity without hydrogen addition. The NRC approved CECo's request by a letter from T. Ross (NRC) to M. Bliss (CECo) dated January 18, 1989. The NRC later revised its safety evaluation (SE) by a letter from

T. Ross to T. Kovach (CECo) dated August 24, 1989, based upon additional design basis information provided by the licensee on May 1, 1989.

In collaboration with the Electric Power Research Institute (EPRI) and General Electric (GE), CECo is planning to conduct a comprehensive SCM test on Quad Cities, Unit 2, in the August/September 1993 time frame. The purpose of the SCM test is to provide an in-core and in-pipe environmental evaluation for reactor component and recirculation system piping lifetime projections. The test will also optimize hydrogen injection rates for best plant performance.

During the SCM testing sequences, the hydrogen injection rates will be increased such that the MSLRM readings will approach the current scram and isolation setpoint value of 1500 mr/hr. In order to eliminate the potential for unwarranted challenges to safety systems, CECo has evaluated the basis of the MSLRM setpoint and the regulatory requirements for revising the setpoint.

The basis of the Technical Specification setpoint (15 times NFPB), as described in the NRC SE, is an assumed NFPB of 100 mr/hr. Recent measurements by CECo have indicated that the actual NFPB is 150 mr/hr. Utilization of this value for NFPB during the SCM test would result in a scram and isolation setpoint for the MSLRMs of 2250 mr/hr. However, CECo has determined that a change to the FSAR to incorporate the actual background level of 150 mr/hr during the SCM test would result in a reduction in the margin of safety as defined in the basis of a Technical Specification (10 CFR 50.59(a)(2)(iii)). Therefore, in accordance with 10 CFR 50.59(c), by letter dated May 18, 1993, CECo requested a license amendment pursuant to 10 CFR 50.90.

This proposed amendment would revise the basis of the scram and isolation setpoint for the MSLRMs, as defined in NRC SEs dated January 18 and August 24, 1989. The proposed change would reduce the potential for unwarranted challenges to safety systems during a special test of the HWC system. CECo has evaluated this proposed change to the basis of the Technical Specification for the MSLRM scram and isolation setpoint, and has concluded that the proposed change (and implementation of the associated setpoint of 2250 mr/hr during the SCM test) would not result in any negative impact upon the radiological release consequences of the limiting design basis accident. The NRC's evaluation is provided below.

3.0 EVALUATION

The present setpoints for MSLRM scram and isolation signal in current technical specifications are based on the assumed NFPB of 100 mr/hr as described in the NRC SE dated August 24, 1989. Recent measurements by the licensee have indicated that the actual NFPB is 150 mr/hr. The licensee has requested to increase the setpoint from 1500 mr/hr (15 times assumed NFPB) to 2250 mr/hr (15 times actual NFPB) for conducting the SCM test. The setpoint will be increased to 2250 mr/hr prior to the start of the test, and returned to 1500 mr/hr at the conclusion of the test. The licensee also indicated that

if the unit were to trip while the setpoint was at 2250 mr/hr, the test procedure would require the reduction of the MSLRM setpoint to the original 1500 mr/hr prior to reactor startup.

The MSLRMs provide reactor scram and reactor vessel and primary containment isolation signals when elevated radiation levels are detected in the main steamlines. However, the only design basis accident that takes credit for the MSLRM is the Control Rod Drop Accident (CRDA). During this accident, the primary function of the MSLRMs is to limit the transport of activity which is released from failed fuel, to the turbine and condensers, by initiating automatic closure of the main steam isolation valves and, thus, isolating the reactor vessel. High radiation levels in the main steam will also produce a reactor scram signal. However, during the CRDA, the scram signal would also be initiated by signals from the neutron monitoring system.

Generic analyses of the consequences of a CRDA have shown that fuel failures are not expected to result from a CRDA occurring at greater than 10% reactor power. This is primarily due to the effects of increased void formation and Doppler reactivity feedback, which cause the rapid decrease of CRDA severity as the reactor power level increases. The SCM test will be conducted well above 10 percent power level.

In the event of a CRDA, the MSLRMs detect high radiation levels in the main steamlines and provide signals for reactor scram and Main Steam Isolation Valve (MSIV) closure. The expected dose rate at the MSLRM during a CRDA has been calculated to be 8 R/hr. Since the expected CRDA dose rate at the MSLRM is over 3.5 times the proposed MSLRM setpoint of 2250 mr/hr (15 times the actual NFPB of 150 mr/hr), the high radiation signal caused by the CRDA will still isolate the MSIVs. The expected dose rates would also result in a scram signal. However, the reactor scram would have already been initiated by the neutron monitoring system.

Since the calculated dose from the CRDA is only a small fraction of the acceptance criteria used by the NRC in Standard Review Plan (SRP) 15.4.9, raising the MSLRM trip setpoint from the current 1500 mr/hr to 2250 mr/hr for the SCM test will not result in a significant increase in the radiological consequences following a CRDA. This conclusion is further supported by an industry analysis which evaluated the consequences of a CRDA without automatic MSIV closure. This analysis was submitted to the NRC as Licensing Topical Report NEDO-31400, dated May 1987 and approved by NRC by a letter from A. Thadani (NRC) to G. J. Bech (BWR Owners' Group) dated May 15, 1991. The analysis is described below.

The industry has performed an analysis to confirm that the radiological release consequence of the CRDA is within the NRC acceptance criteria, even without the automatic MSIV closure. The analysis examined two cases for the CRDA; the bounding FSAR case, which assumes automatic MSIV closure; and the CRDA without automatic MSIV closure. In the first case (i.e., design basis CRDA with automatic MSIV closure), the analysis resulted in calculated offsite doses of 4.3 rem to the thyroid, and 0.31 rem whole-body. The offsite dose

criterion used by SRP 15.4.9 for the CRDA is that offsite doses should be less than 25% of the 10 CFR 100 guidelines; i.e, the thyroid dose should be less than 75 rem and the whole-body dose should be less than 6 rem. Therefore, the calculated offsite doses from the bounding FSAR case represent 5.7% and 5.2% of the 10 CFR 100 guidelines for thyroid and whole-body dose.

In the second case (i.e., CRDA without automatic MSIV closure), if the event occurs at low power and the Steam Jet Air Ejector (SJAE) does not operate, the offsite dose is equivalent to the first case. This is based upon the assumption that the total activity is instantaneously transferred to the condenser. If sufficient power is available for SJAE operation, some of the available activity is transferred into the offgas system. This provides a different release path for a portion of the radioactivity. The offgas system charcoal beds would then retain the iodine component of the radioactivity. The particulate daughters of the noble gases (xenon and krypton) would also be held in the charcoal beds for significant decay times before release. For offgas systems with krypton decay times greater than twenty hours, the total dose from noble gas is less than 0.55 rem. This is comparable to the whole-body dose for the first case (CRDA with MSIV closure). The expected holdup time for krypton in the Quad Cities offgas system is approximately 20 hours.

CECo has also evaluated the remaining applicable plant parameters identified in NEDO-31400, and has verified that these parameters are bounded by the assumptions in NEDO-31400.

The industry analysis (NEDO-31400) also examined the impact of a postulated flow blockage event on the potential for increased plant contamination and resultant high occupational exposures due to plant contamination. The analysis estimated that the MSLRM could detect this event if the release was a sudden puff with a duration of approximately 10 seconds or less. However, the response time of the MSLRM, combined with the MSIV closure time (about 10 seconds total), is such that the release would already be downstream of the MSIVs prior to isolation. Therefore, such a puff release would not be stopped in time to prevent contamination of the plant, even with the automatic MSLRM isolation function. If the puff release (assuming a constant amount of radioactivity) were extended over a longer period of time (i.e., over several minutes), the MSLRM would probably not detect the release due to masking effects from nitrogen-16 activity. In this case, the activity could be detected approximately two minutes after release by the offgas radiation monitors (due to nitrogen-16 decay), and isolated through manual operator actions.

Based on the above discussion and analysis, the staff has concluded that the proposed change of the basis for the MSLRM scram and isolation setpoint Technical Specification and resultant setpoint change to 2250 mr/hr during the duration of the SCM test, is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change 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 NRC 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 the amendments involve no significant hazards consideration, and there has been no public comment on such finding (58 FR 32379). Accordingly, the 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 or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Chandu P. Patel

Date: August 3, 1993