

November 4, 1992

Docket No. 50-254

Mr. Thomas J. Kovach
Nuclear Licensing Manager
Commonwealth Edison Company-Suite 300
OPUS West III
1400 OPUS Place
Downers Grove, Illinois 60515

Dear Mr. Kovach:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. M80023)

The Commission has issued the enclosed Amendment No. 139 to Facility Operating License No. DPR-29 for the Quad Cities Nuclear Power Station, Unit 1. The amendment is in response to your application dated July 6, 1992.

The amendment reflects a modification to the High Pressure Coolant Injection turbine steam exhaust line. The amendment adds the requirements for the new containment isolation valves which are part of the modification.

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:

Leonard N. Olshan, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 139 to DPR-29
2. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION:

Docket Files	JRoe
PDIII-2 r/f	JZwolinski
RBarrett	LOlshan
CMoore	OGC
DHagan	R. Goel
GHill(4)	WJones
CGrimes	ACRS(10)
OPA	OC/LFMB
PDIII-2 p/f	NRC & Local PDRs
BClayton, RIII	

100024

ENCLOSURE COPY

OFC	LA	PM:PDIII-2	D:PDIII-2	OGC
NAME	CMOORE	LOLSHAN	RBARRETT	M Young
DATE	10/25/92	10/26/92	10/4/92	10/30/92

9211120320 921104
PDR ADOCK 05000254
P PDR

DFC

November 4, 1992

Docket No. 50-254

Mr. Thomas J. Kovach
Nuclear Licensing Manager
Commonwealth Edison Company-Suite 300
OPUS West III
1400 OPUS Place
Downers Grove, Illinois 60515

Dear Mr. Kovach:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. M80023)

The Commission has issued the enclosed Amendment No. 139 to Facility Operating License No. DPR-29 for the Quad Cities Nuclear Power Station, Unit 1. The amendment is in response to your application dated July 6, 1992.

The amendment reflects a modification to the High Pressure Coolant Injection turbine steam exhaust line. The amendment adds the requirements for the new containment isolation valves which are part of the modification.

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:

Leonard N. Olshan, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:

- 1. Amendment No. 139 to DPR-29
- 2. Safety Evaluation

cc w/enclosures:
See next page

DISTRIBUTION:

Docket Files	JRoe
PDIII-2 r/f	JZwolinski
RBarrett	LOlshan
CMoore	OGC
DHagan	R. Goel
GHill(4)	WJones
CGrimes	ACRS(10)
OPA	OC/LFMB
PDIII-2 p/f	NRC & Local PDRs
BClayton, RIII	

OFC	LA PDIII-2	PM: PDIII-2	D: PDIII-2	OGC
NAME	CMOORE	LOLSHAN	RBARRETT	At Youngs
DATE	10/15/92	10/26/92	10/4/92	10/30/92



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

November 4, 1992

Docket No. 50-254

Mr. Thomas J. Kovach
Nuclear Licensing Manager
Commonwealth Edison Company-Suite 300
OPUS West III
1400 OPUS Place
Downers Grove, Illinois 60515

Dear Mr. Kovach:

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. M80023)

The Commission has issued the enclosed Amendment No. 139 to Facility Operating License No. DPR-29 for the Quad Cities Nuclear Power Station, Unit 1. The amendment is in response to your application dated July 6, 1992.

The amendment reflects a modification to the High Pressure Coolant Injection turbine steam exhaust line. The amendment adds the requirements for the new containment isolation valves which are part of the modification.

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,

A handwritten signature in cursive script that reads "Leonard N. Olshan".

Leonard N. Olshan, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 139 to DPR-29
2. Safety Evaluation

cc w/enclosures:
See next page

Mr. Thomas J. Kovach
Commonwealth

Quad Cities Nuclear Power Station
Unit Nos. 1 and 2

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

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. 139
License No. DPR-29

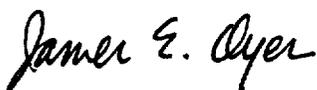
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Commonwealth Edison Company (the licensee) dated July 6, 1992, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and 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. 139, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective immediately, to be implemented during the twelfth refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment:
Changes to the Technical
Specifications

Date of Issuance: November 4, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 139

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

3.2/4.2-8

3.2/4.2-8a

3.2/4.2-15

3.7/4.7-37

3.7/4.7-38

INSERT

3.2/4.2-8

3.2/4.2-8a

3.2/4.2-15

3.7/4.7-37

3.7/4.7-38

QUAD-CITIES
DPR-29

setting of 140% of rated steam flow, in conjunction with the flow limiters and main steamline valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel temperatures remain less than 1500°F, and release of radioactivity to the environs is well below 10 CFR 100 guidelines (reference SAR Sections 14.2.3.9 and 14.2.3.10).

Temperature monitoring instrumentation is provided in the main steamline tunnel to detect leaks in this area. Trips are provided on this instrumentation and when exceeded cause closure of Group 1 isolation valves. Its setting of 200°F is low enough to detect leaks of the order of 5 to 10 gpm; thus it is capable of covering the entire spectrum of breaks. For large breaks, it is a backup to high-steam flow instrumentation discussed above, and for small breaks with the resulting small release of radioactivity, gives isolation before the guidelines of 10 CFR 100 are exceeded.

High radiation monitors in the main steamline tunnel have been provided to detect gross fuel failure. This instrumentation causes closure of Group 1 valves, the only valves required to close for this accident. With the established setting of 15 times normal background (without hydrogen addition) and main steamline isolation valve closure, fission product release is limited so that 10 CFR 100 guidelines are not exceeded for this accident (reference SAR Section 14.2.1.7).

Pressure instrumentation is provided which trips when main steamline pressure drops below 825 psig. A trip of this instrumentation results in closure of Group 1 isolation valves. In the Refuel and Startup/Hot Standby modes this trip function is bypassed. This function is provided primarily to provide protection against a pressure regulator malfunction which would cause the control and/or bypass valve to open. With the trip set at 825 psig, inventory loss is limited so that fuel is not uncovered and peak cladding temperatures are much less than 1500°F; thus, there are no fission products available for release other than those in the reactor water (reference SAR Section 11.2.3).

The RCIC and the HPCI high flow and temperature instrumentation are provided to detect a break in their respective piping. A trip of this instrumentation results in closure of the RCIC or HPCI steam supply isolation valves. The trip logic for this function is similar to that for the main steamline isolation valves, thus all sensors are required to be operable or in a tripped condition to meet single-failure criteria. The trip settings of 170°F and 300% of design flow and valve closure time are such that core uncover is prevented and fission product release is within limits. In addition, the steam supply valves for each system are closed on low steamline pressure to provide primary containment isolation when the reactor pressure, as sensed in the system steamlines, is below the required pressure for turbine operation.

Operation of the HPCI turbine will continue as long as reactor pressure is above 150 psig. When the reactor pressure falls below 150 psig, the speed of the turbine-pump unit will decrease and gradually be slowed due to stop

QUAD-CITIES
DPR-29

friction and windage losses at low reactor pressures. The low reactor pressure isolation setpoint was developed in accordance with NEDC-31336, "General Electric Instrument Setpoint Methodology," dated October 1986. The trip setpoint of greater than or equal to 100 psig was calculated such that the isolation will occur on decreasing reactor pressure to provide primary containment isolation when the reactor pressure, as sensed in the system steamlines, is below the required pressure for turbine operation. The external vacuum breaker line for the HPCI turbine will isolate on low steamline pressure concurrent with high drywell pressure signals. The instrumentation and controls ensure the proper HPCI and primary containment response to a HPCI steamline break (isolation of the steamline supply valves only), a large break inside the containment (closure of the steam supply and vacuum relief isolation valves) and a small or intermediate size break inside containment (steam supply and vacuum breaker isolation valves remain open for HPCI operation).

QUAD-CITIES
DPR-29

TABLE 3.2-1

INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION FUNCTIONS

<u>Minimum Number of Operable or Tripped Instrument Channels [1]</u>	<u>Instruments</u>	<u>Trip Level Setting</u>	<u>Action[2]</u>
4	Reactor low water[5]	>144 inches above top of active fuel*	A
4	Reactor low low water	>84 inches above top of active fuel*	A
4	High drywell pressure[5]	≤2.5 psig [3]	A
16	High flow main steamline[5]	≤140% of rated steam flow	B
16	High temperature main steamline tunnel	≤200°F	B
4	High radiation main steamline tunnel[6]	<15 x normal rated power background (without hydrogen addition)	B
4	Low main steam pressure[4]	≥825 psig	B
2	High flow RCIC steamline	<300% of rated steam flow[7]	C
4	RCIC turbine area high temperature	≤170°F	C
2	High flow HPCI steamline	<300% of rated steam flow[7]	D
4	HPCI area high temperature	≤170°F	D
4	HPCI Steamline pressure	≥100 psig	D

Notes

[1] Whenever primary containment integrity is required, there shall be two operable or tripped systems for each function, except for low pressure main steamline which only need be available in the Run position.

QUAD-CITIES
DPR-29

TABLE 3.7-1 (Cont'd)
PRIMARY CONTAINMENT ISOLATION

Isolation Group	Valve Identification	Valve Number for Units 1 and 2	Number of Power-Operated Valves Inboard	Outboard	Maximum Operating Time (sec)	Normal Operating Position	Action on Initiating Signal
<u>Reactor Water Cleanup</u>							
3	Pump suction isolation valve	MO-1201-2	1		≤30	0	GC
3	Pump suction isolation valve	MO-1201-5		1	≤30	0	GC
<u>HPCI</u>							
4	Steam isolation valve	MO-2301-4	1		≤50	0	GC
4	Steam isolation valve	MO-2301-5		1	≤50	0	GC
4	Vacuum breaker isolation	MO-2399-40	1		≤50	0	GC
4	Vacuum breaker isolation	MO-2399-41		1	≤50	0	GC
<u>RCIC</u>							
5	Turbine steam supply	MO-1301-16	1		≤25	0	GC
5	Turbine steam supply	MO-1301-17		1	≤25	0	GC

QUAD-CITIES
DPR-29

TABLE 3.7-1 (Cont'd)

Key: O: open
C: closed
SC: stays closed
GC: goes closed

Note: Isolation groupings are as follows:

Group 1: The valves in Group 1 are closed upon any one of the following conditions:

1. Reactor low-low-water level
2. Main steamline high radiation
3. Main steamline high flow
4. Main steamline tunnel high temperature
5. Main steamline low pressure

Group 2: The actions in Group 2 are initiated by any one of the following conditions:

1. Reactor low water level
2. High drywell pressure

Group 3: Reactor low water level alone initiates the following:

1. Cleanup demineralizer system isolation

Group 4: The steam supply isolation valves in the high pressure coolant injection system (HPCI) are closed upon any one of the following signals:

1. HPCI steamline high flow
2. High temperature in the vicinity of the HPCI steamline
3. Low reactor pressure

The turbine exhaust vacuum breaker isolation valves close when both of the following signals are present (simultaneously):

1. High drywell pressure
2. Low reactor pressure

Group 5: Isolation valves in the reactor core isolation cooling system (RCIC) are closed upon any one of the following signals:

1. RCIC steamline high flow
2. High temperature in the vicinity of the RCIC steamline
3. Low reactor pressure



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 139 TO FACILITY OPERATING LICENSE NO. DPR-29

COMMONWEALTH EDISON COMPANY

AND

IOWA-ILLINOIS GAS AND ELECTRIC COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-254

1.0 INTRODUCTION

By letter dated July 6, 1992, Commonwealth Edison Company (CECo, the licensee) proposed modifications to the High Pressure Coolant Injection (HPCI) turbine steam exhaust line for Quad Cities Nuclear Power Station, Unit 1. The licensee indicated that the modifications will create a new containment boundary such that the steam exhaust line check valve 2301-45 can be removed from the 10 CFR 50, Appendix J, leak rate testing program. The above valve has experienced repeated local leak rate (LLRT) failures due to deterioration caused by the unstable steam condensation during HPCI low steam flow conditions. The proposed modifications add the ability to isolate the vacuum breaker line through the use of two new motor-operated isolation valves which are being added to Technical Specification (TS) Table 3.7-1. The proposed modifications will also improve the reliability of the vacuum breaker with a "one-out-of-two twice" check valve configuration, improve access for maintenance due to relocation, and improve the steam condensation stability through the use of a sparger to minimize the cyclical "chugging" load on the 2301-45 valve.

The licensee also proposed to add requirements for the HPCI low steam pressure isolation setpoints signal for Group IV valves isolation to TS Table 3.2-1 and associated changes to the TS Bases.

2.0 EVALUATION

The licensee indicated that the existing HPCI turbine steam exhaust line contains two large check valves, 2301-45 and 2301-74. Inside the torus, a vacuum breaker line equipped with two small check valves ties into the steam line downstream of the exhaust steam check valves. During normal HPCI operation, the vacuum breaker relieves the vacuum which is created by steam condensation in the exhaust line downstream of large check valves. The vacuum breaker line provides a path for communication between the inside containment atmosphere and the outside. The HPCI steam exhaust check valves are designed

to prevent post-accident containment atmosphere from escaping to the outside and the water from backing up into the turbine.

The licensee proposed to replace the existing vacuum breaker line with a new vacuum breaker line that will contain two motor-operated isolation valves, four check valves in "one-out-of-two twice" arrangement, two blocking gate valves, and tap lines for Appendix J, Type C, leak testing. The two isolation valves will be safety-related and powered from 250V DC and 480V AC Division II power sources. The licensee indicated that the logic for the vacuum breaker isolation valves has been developed according to the recommendations in General Electric Service Information Letter (SIL) No. 30 and is consistent with that of later designed operating plants. The vacuum line isolation valves will normally be open to assure the operational readiness of HPCI. These valves are designed to close automatically during high drywell pressure, indicative of a large break inside the drywell, concurrent with low reactor pressure conditions such as when HPCI can no longer perform its design function. The logic for the closure of each valve is "one-out-of-two taken twice" arrangement. The isolation signal is featured with a signal seal-in such that the signal must be reset and manual action implemented to open the valves following isolation. Based on the above discussion, the staff finds the new vacuum line configuration and logic for relief valves isolation acceptable as it is designed to meet current safety standards. The licensee has proposed a maximum of 50 seconds closure time for new vacuum breaker isolation valves to close under low reactor pressure conditions, concurrent with high drywell pressure for closure, prior to fuel damage. The above closure time is based on the ability of the valves to close and assure that any radiological release is below the regulatory and technical specification limits. The staff finds the 50 seconds closure time for 4-inch isolation valves, as discussed above, acceptable.

The licensee also proposed to install a sparger at the end of the HPCI turbine exhaust line inside the torus to promote more stable steam condensation. The first row of holes on the sparger will be located at or below the current HPCI exhaust line. The suppression pool inventory will provide an effective water seal for the exhaust line during the post-accident period. Containment isolation for the exhaust line will be provided by the 2399-40 and 2301-41 valves, with an effective water seal at the exhaust outlet. These two valves will be tested in accordance with Appendix J. The staff considers that due to radioactivity in the torus water, the 2301-45 check valve should be tested for leaks during inservice inspection and testing according to the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, per 10 CFR 50.55a(f). The licensee, in a letter dated August 17, 1992, agreed to continue testing the 2301-45 valve utilizing Appendix J methodologies until the new testing requirements are incorporated into the IST Program. The staff finds this acceptable.

The licensee indicated that TS Table 4.2-1 requires that the HPCI isolation instruments be periodically calibrated and tested. TS Table 3.2-1, "Instrumentation That Initiates Primary Containment Isolation Functions," does not contain any requirements for the HPCI low reactor pressure setpoint. To

correct the omission, the licensee proposed to add this requirement to Table 3.2-1. The basis for the HPCI turbine steam line low pressure isolation is to assure that steam and radioactive gases will not escape from the HPCI turbine shaft seals into the reactor building after steam pressure has decreased to such a low value that the turbine can not be operated.

The licensee stated that the instruments are currently set so that the isolation does not occur before reactor pressure decreases to 90 psig. Prior to TS Amendment Nos. 130 and 124, for Units 1 and 2, respectively, HPCI was required to be operable at a reactor pressure greater than 90 psig. The current SAFER/GESTR analysis for Quad Cities credits HPCI operation at pressures as low as 150 psig. To calculate a new isolation setpoint, General Electric performed an analysis according to NEDC-31336, "General Electric Instrument Setpoint Methodology" dated October 1986. The upper bounding limit for the isolation was chosen at 150 psig based on the SAFER/GESTR analysis inputs and a lower bounding limit of 95 psig was chosen based on GE experience to assure equipment protection. The GE recommended value for the isolation setpoint is 100 psig. Based on the above discussion, the staff finds that the proposed HPCI low steam pressure isolation setpoint at a pressure of greater than or equal to 100 psig to be added to TS Table 3.2-1 for isolation of Group IV valves acceptable. The addition of the above setpoint does not increase the probability or consequences of an accident as the isolation feature of HPCI is part of the original design basis. The isolation setpoint assures that the isolation function is initiated at an appropriate pressure and that HPCI will remain operable as assumed in the accident analysis.

Based on the above evaluation, the staff considers that the proposed modification to the HPCI turbine steam exhaust line vacuum breaker configuration, the proposed TS changes to add HPCI low pressure isolation setpoint to Table 3.2-1, to add two new vacuum line primary containment isolation valves to Table 3.7-1, and the associated changes to the Bases, are acceptable. Furthermore, the staff concludes the valve 2301-45 is no longer subject to Appendix J, Type C, testing.

3.0 STATE CONSULTATION

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

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 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 the amendment involves no significant hazards consideration, and there has been no

public comment on such finding (57 FR 37563). Accordingly, the 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 or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 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 this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: R. Goel, SPLB

Date: November 4, 1992