

March 31, 1998

Mr. Oliver D. Kingsley, President  
Nuclear Generation Group  
Commonwealth Edison Company  
Executive Towers West III  
1400 Opus Place, Suite 500  
Downers Grove, IL 60515

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24  
REGARDING CRITICALITY ACCIDENT REQUIREMENTS - QUAD CITIES  
NUCLEAR POWER STATION, UNITS 1 AND 2 (TAC NOS. M99945 AND M99946)

Dear Mr. Kingsley:

By letter dated October 27, 1997, you requested an exemption from the requirements of 10 CFR 70.24 concerning criticality monitors for the Quad Cities Nuclear Power Station.

On the basis of the information provided, there is reasonable assurance that irradiated and unirradiated fuel will remain subcritical. Although Quad Cities is not licensed to General Design Criterion (GDC) 63, you maintain radiation monitors consistent with these requirements. The low probability of a criticality, together with your adherence to GDC 63 requirements, constitutes good cause for granting an exemption from 10 CFR 70.24.

Pursuant to 10 CFR 70.14, the NRC is granting the enclosed exemption for Quad Cities, Units 1 and 2. A copy of the exemption is being sent to the Office of the Federal Register for publication.

Sincerely,

Orig. signed by

Robert M. Pulsifer, Project Manager  
Project Directorate III-2  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-254 and 50-265

Enclosure: Exemption

cc w/encl: See next page

Distribution: Docket File PUBLIC PD3-2 R/F RCapra  
OGC EAdensam (EGA1) TEssig RPulsifer CMoore  
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DATE	3/17/98		2/13/98		3/2/98		3/02/98	3/24/98	
OFFICE	OGC		DRPW:(A) ADP		NRR:(A) ADP		NRR:D		
NAME	*APH		EAdensam		BBoger		SCollins		
DATE	3/16/98		3/21/98		3/26/98		3/21/98		

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Mr. Oliver D. Kingsley, President  
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DATE	2/26/98		2/13/98		2/25/98		2/22/98	2/ /98
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OFFICE	OGC		DRPW:(A)D		NRR:(A) ADP		NRR:D
NAME			EAdensam		BBoger		SCollins
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March 31, 1998

otherwise in the public interest. Therefore, the Commission hereby grants the licensee an exemption from the requirements of 10 CFR 70.24 for Quad Cities.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant adverse environmental impact (63 FR 10957).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by  
Samuel J. Collins

Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
this 31st day of March 1998

\*see previous page for concurrence

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NAME	RPulsifer		*BCalure		*CMoore		*Collins		Capra	ROA
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OFFICE	OGC		DREW:(A)D		NRR:(A) ADP				NRR:D	
NAME	*AHodgdon		EAdensam		BBoger				SCollins	
DATE	03/16/98		3/25/98		3/16/98				3/16/98	

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OFFICE	OGC		DRPW:(A)D		NRR:(A) ADP		NRR:D			
NAME	AP H		EAdensam		BBoger		SCollins			
DATE	3/16/98		1/98		3/26/98		3/27/98			

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IV.

The Commission has determined that pursuant to 10 CFR 70.14, this exemption is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. Therefore, the Commission hereby grants the licensee an exemption from the requirements of 10 CFR 70.24 for Quad Cities.

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FOR THE NUCLEAR REGULATORY COMMISSION

Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
this        day of February 1998

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NAME			EAdensam		BBoger		SCollins
DATE	/ / 98		/ / 98		/ / 98		/ / 98

*(Handwritten initials)*



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

March 31, 1998

Mr. Oliver D. Kingsley, President  
Nuclear Generation Group  
Commonwealth Edison Company  
Executive Towers West III  
1400 Opus Place, Suite 500  
Downers Grove, IL 60515

SUBJECT: ISSUANCE OF EXEMPTION FROM THE REQUIREMENTS OF 10 CFR 70.24  
REGARDING CRITICALITY ACCIDENT REQUIREMENTS - QUAD CITIES  
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Sincerely,

A handwritten signature in black ink, appearing to read "Robert M. Pulsifer".

Robert M. Pulsifer, Project Manager  
Project Directorate III-2  
Division of Reactor Projects III/IV  
Office of Nuclear Reactor Regulation

Docket Nos. 50-254 and 50-265

Enclosure: Exemption

cc w/encl: See next page

O. Kingsley  
Commonwealth Edison Company

cc:

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Commonwealth Edison Company  
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U.S. Nuclear Regulatory Commission  
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Chairman  
Rock Island County Board  
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1504 3rd Avenue  
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Office of Nuclear Facility Safety  
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Regional Administrator  
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BWR's Vice President  
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Ms. Irene Johnson, Licensing Director  
Nuclear Regulatory Services  
Commonwealth Edison Company  
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1400 Opus Place, Suite 500  
Downers Grove, IL 60515

O. Kingsley  
Commonwealth Edison Company

- 2 -

Quad Cities Nuclear Power Plant  
Units 1 and 2

Commonwealth Edison Company  
Reg. Assurance Supervisor - Quad Cities  
22710 206th Avenue N.  
Cordova, Illinois 61242-9740

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
COMMONWEALTH EDISON COMPANY	)	Docket Nos. 50-254
	)	and 50-265
MIDAMERICAN ENERGY COMPANY	)	
	)	
(Quad Cities Nuclear Power Station,	)	
Units 1 and 2)	)	

EXEMPTION

I.

Commonwealth Edison Company (ComEd) and MidAmerican Energy Company are the holders of Facility Operating License Nos. DPR-29 and DPR-30, which authorize operation of the Quad Cities Nuclear Power Station, Units 1 and 2 (the facility). ComEd (the licensee) is the holder of a 75-percent ownership share in Quad Cities. ComEd, acting as agent and representative of the two owners listed on the licenses, is licensed to operate the facility. The license provides, among other things, that the facility is subject to all the rules, regulations, and orders of the U.S. Nuclear Regulatory Commission now or hereafter in effect.

The facility is a boiling-water reactor located at the licensees' site in Rockford County, Illinois.

II.

Section 70.24 of Title 10 of the Code of Federal Regulations, "Criticality Accident Requirements," requires that each licensee authorized to possess special nuclear material maintain a criticality accident monitoring system in each area in which such material is handled, used, or stored. Subsections (a)(1) and (a)(2) of 10 CFR 70.24 specify detection and sensitivity requirements that these monitors must meet. Subsection (a)(1) also specifies that all areas

subject to criticality accident monitoring must be covered by two detectors. Subsection (a)(3) of 10 CFR 70.24 requires licensees to maintain emergency procedures for each area in which this licensed special nuclear material is handled, used, or stored and requires that (1) the procedures ensure that all personnel withdraw to an area of safety upon the sounding of a criticality accident monitor alarm, (2) the procedures include drills to familiarize personnel with the evacuation plan, and (3) the procedures designate responsible individuals for determining the cause of the alarm and placement of radiation survey instruments in accessible locations for use in such an emergency. Subsection (b)(1) of 10 CFR 70.24 requires licensees to provide the means of identifying quickly any personnel who have received a dose of 10 rads or more. Subsection (b)(2) of 10 CFR 70.24 requires licensees to maintain personnel decontamination facilities, arrangements for a physician and other medical personnel qualified to handle radiation emergencies, and arrangements for the transportation of contaminated individuals to treatment facilities outside the site boundary. Paragraph (c) of 10 CFR 70.24 exempts Part 50 licensees from the requirements of paragraph (b) of 10 CFR 70.24 for special nuclear material used or to be used in the reactor. Subsection (d) of 10 CFR 70.24 states that any licensee that believes that there is good cause why it should be granted an exemption from all or part of 10 CFR 70.24 may apply to the Commission for such an exemption and shall specify the reasons for the relief requested.

### III.

The special nuclear material that could be assembled into a critical mass at Quad Cities is in the form of nuclear fuel. The quantity of special nuclear material other than fuel that is stored on site in any given location is small enough to preclude achieving a critical mass. The Commission's technical staff has evaluated the possibility of an inadvertent criticality of the

nuclear fuel at Quad Cities and has determined that it is extremely unlikely that such an accident will occur if the licensees meet the following seven criteria:

1. Only three boiling-water reactor new fuel assemblies are allowed out of a shipping cask or a storage rack at one time;
2. The k-effective dose does not exceed 0.95, at a 95-percent probability, 95-percent confidence level, in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water;
3. If optimum moderation occurs at low moderator density, the k-effective dose does not exceed 0.98, at a 95-percent probability, 95-percent confidence level, in the event that the fresh fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with a moderator at the density corresponding to optimum moderation;
4. The k-effective dose does not exceed 0.95, at a 95-percent probability, 95-percent confidence level, in the event that the spent fuel storage racks are filled with fuel of the maximum permissible U-235 enrichment and flooded with pure water;
5. The quantity of special nuclear material, other than nuclear fuel, stored on-site in any given area is less than the quantity necessary for a critical mass;
6. Radiation monitors, as required by General Design Criterion (GDC) 63, are provided in fuel storage and handling areas to detect excessive radiation levels and to initiate appropriate safety actions; and
7. The maximum nominal U-235 enrichment is limited to 5.0 weight percent.

By letter dated October 27, 1997, the licensee requested an exemption from 10 CFR 70.24. In this request, the licensee addressed the seven criteria previously stated. The licensee stated that Quad Cities does not analyze optimum moderation conditions as addressed in Criteria 3 above, but has used a standard industry practice by implementing administrative and physical

controls in accordance with General Electric Service Information Letter 152, "Criticality Margins for the Storage of New Fuel." To preclude the existence of an optimum moderation condition in the new fuel storage vault area, the following controls are used: the new fuel storage vault is verified dry; the drains are free and clear of obstruction before new fuel storage; low velocity fog nozzles (fire protection) in the vicinity of the dry storage vault have been removed; and the new fuel storage vault plugs are installed during prolonged work delays. The staff has found this practice acceptable.

The Commission's technical staff has reviewed the licensee's submittal and has determined that Quad Cities meets the criteria for prevention of inadvertent criticality. Therefore, the staff has determined that it is extremely unlikely that an inadvertent criticality will occur in the handling of special nuclear materials or in their storage areas at Quad Cities.

The purpose of the criticality monitors required by 10 CFR 70.24 is to ensure that if a criticality were to occur during the handling of special nuclear material, personnel would be alerted to that fact and would take appropriate action. The staff has determined that it is extremely unlikely that such an accident could occur. Although Quad Cities is not licensed to GDC 63, the licensee has radiation monitors consistent with the requirements of GDC 63 in fuel storage and handling areas. These monitors will alert personnel to excessive radiation levels and allow them to initiate appropriate safety actions. The low probability of an inadvertent criticality, together with the licensee's adherence to the requirements of GDC 63, constitutes good cause for granting an exemption to the requirements of 10 CFR 70.24.

#### IV.

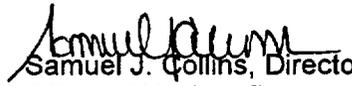
The Commission has determined that pursuant to 10 CFR 70.14, this exemption is authorized by law, will not endanger life or property or the common defense and security, and is

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Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant adverse environmental impact (63 FR 10957).

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FOR THE NUCLEAR REGULATORY COMMISSION

  
Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,  
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