



**Commonwealth Edison**  
 Northern Division  
 Northwest Area Headquarters  
 201 N. Arthur Avenue  
 Mt. Prospect, Illinois 60056

August 9, 1982

EA 82-78  
 Rec'd 8/11/82

Mr. Richard C. DeYoung, Director  
 Office of Inspection and Enforcement  
 U.S. Nuclear Regulatory Commission  
 Washington, D.C. 20555

Subject: Zion Station Unit 1  
 Response to I.E.  
 Inspection Report No.  
 50-295/82-09  
NRC Docket No. 50-295

Reference (a): July 9, 1982, letter from  
 J. G. Keppler to J. J. O'Connor.

Dear Mr. DeYoung:

Reference (a) contained the results of a special inspection conducted by Messrs. D. E. Miller and L. R. Greger of the NRC's Region III office on March 30-31, April 7-8, and 29, 1982, of activities at the Zion Station. The special inspection was conducted to review the circumstances surrounding the overexposure received by a worker during an entry beneath the Unit 1 reactor vessel on March 25, 1982. During that inspection, certain activities appeared to be in noncompliance with NRC requirements. The Attachment to this letter provides Commonwealth Edison's response to the Notice of Violation.

To the best of my knowledge and belief the statements contained in the attachment are true and correct. In some respects these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Please address questions regarding this matter to this office.

Very truly yours,

Byron Lee, Jr.  
 Executive Vice-President

lm

cc: J. G. Keppler  
 NRC Region III

SUBSCRIBED and SWORN to  
 before me this 9th day  
 of August, 1982

Notary Public

DCS

**BILL FOR COLLECTION**

Bill No. \_\_\_\_\_

U.S. Nuclear Regulatory Commission

Date August 12, 1982

(Department or Establishment and Bureau or Office)  
Washington, DC 20555

(Address)

PAYER:

Commonwealth Edison Company  
 P.O. Box 767  
 Chicago, IL 60690

*This bill should be returned by the payer with his remittance.  
 SEE INSTRUCTIONS BELOW.*

Date	DESCRIPTION	Quantity	Unit Price		Amount
			Cost	Per	
8/12/82	Full payment for CP regarding Docket No. 50-295, dated 7/9/82.				\$100,000.00
<b>AMOUNT DUE THIS BILL,</b>					<b>\$100,000.00</b>

*This is not a receipt*

**INSTRUCTIONS**

Tender of payment of the above bill may be made in cash, United States postal money order, express money order, bank draft, or check, to the office indicated. Such tender, when in any other form than cash, should be drawn to the order of the Department or Establishment and Bureau or Office indicated above.

Receipts will be issued in all cases where "cash" is received, and only upon request when remittance is in any other form. If tender of payment of this bill is other than cash or United States postal money order, the receipt shall not become an acquittance until such tender has been cleared and the amount received by the Department or Establishment and Bureau or Office indicated above.

Failure to receive a receipt for a cash payment should be promptly reported by the payer to the chief administrative officer of the bureau or agency mentioned above.

IE-14

ATTACHMENT

COMMONWEALTH EDISON COMPANY

ZION STATION UNIT 1

RESPONSE TO NOTICE OF VIOLATION

A. ITEM OF NON-COMPLIANCE

10 CFR 20.201(b) requires that each licensee make or cause to be made such evaluations of radiation hazards as (1) may be necessary for the licensee to comply with the regulations in 10 CFR Part 20, and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present.

Contrary to the above, the licensee failed to make such radiation evaluations as were necessary and reasonable under the circumstances to ensure compliance with 10 CFR 20.101 for entries of individuals into an area beneath the Unit 1 reactor vessel on March 24 and 25, 1982.

Admission or Denial of Alleged Violation

The licensee admits the alleged violation.

Reasons for Violation

The radiation-chemistry technician (RCT) involved in the incident failed to survey certain areas of the reactor cavity below the reactor vessel because he did not expect the individual involved in the overexposure to be in those areas. Exposure rates in the unsurveyed area below the reactor vessel were higher than the upper limit of the instrument used.

Corrective Actions Taken and Results Achieved

1. The person involved in the overexposure was spoken to specifically on the importance of always following the radiation protection standards. All the RCTs were spoken to on the importance of communicating thoroughly with the work crews and rad-chem management before jobs begin. At a station safety meeting personnel were also spoken to on the importance of following all requirements of the station radiation protection standards. This includes notifying the radiation-chemistry department of all jobs for which they expect to receive greater than 50 mrem/day. This notification is now achieved by filling out a required radiation work permit (RWP); the RWP program was instituted July 1, 1982. The importance of abiding by the radiation protection standards is also being stressed in the initial station radiation training program.

2. The importance of bringing to the job instruments of appropriate meter range was also stressed to the RCTs. The rad-chem department has ordered two Eberline ionization detectors with lighted dials that can measure up to 100 R/h, and five more extendable GM detectors (Teletectors) that can measure up to 1000 R/h. They are expected to arrive by November 1, 1982. This would bring the station's current inventory of operable Teletectors to seven.

Corrective Actions To Be Taken To Avoid Further Non-Compliance

At RCT re-training (July 26 - October 15, 1982), the RCTs will be further instructed to talk more with the work crews and rad-chem management in order to better understand jobs. Survey techniques will be further covered. All RCTs, rad-chem foremen, and health physicists will also be taught about the incore system and the special radiation hazards associated with the reactor cavity during refueling.

Date When Full Compliance Will Be Met

Measures have already been taken to ensure that RCTs are aware of the importance of adequately assessing work crew jobs and survey requirements. The RCTs will have their training completed by October 15, 1982. Following this, full compliance will be achieved when the new radiation instruments are obtained. They are expected to arrive by November 1, 1982.

B. ITEM OF NON-COMPLIANCE

10 CFR 20.101(a) limits the whole body radiation dose of any individual in a restricted area to one and one quarter rems per calendar quarter, except as provided by 10 CFR 20.101(b). Paragraph (b) permits a whole body dose of three rems per calendar quarter provided certain specified conditions are met.

Contrary to the above, during the first calendar quarter of 1982, an individual received a whole body dose of approximately five rems. Most of this dose was received while making an entry into the area beneath the Unit 1 reactor vessel on March 25, 1982.

Admission or Denial of Alleged Violation

The licensee admits the alleged violation.

Reasons for Violations

The individual went into an area that had not been previously surveyed for radiation hazards. There was a lack of detailed work planning and briefing of all participants prior to the start of the job. The rad-chem personnel involved lacked a good understanding of how the incore detector equipment worked, and did not realize that very high radiation fields exist around withdrawn incore thimbles



because of neutron activation. In addition, rad-chem personnel were not aware that the incore thimbles were withdrawn, and all personnel involved failed to adequately evaluate the potential for very high exposure rates in the reactor cavity area.

#### Corrective Actions Taken and Results Achieved

In addition to the corrective actions discussed in Item A above, the following actions have been taken.

1. The main door to the Unit 1 reactor cavity is now locked with a special lock. Previously there was an R-key lock in place, which is the standard method used to control entry into any high radiation area.
2. The administrative procedure covering containment access control has been amended to prohibit entry into the reactor cavity unless all of the following conditions exist:
  - a. The incore thimbles are fully inserted in the reactor vessel.
  - b. The incore detectors are taken out-of-service.
  - c. The incore detectors are in storage or inserted in the reactor vessel.

This will preclude entry into the reactor cavity when high exposure rates are present. Prior to any personnel entry into the reactor cavity area, the rad-chem department must first verify that conditions a, b, and c above are met. A safety person must be stationed at the entrance to the reactor cavity.

3. Mechanical maintenance procedure RCO01-12 (Retracting and Inserting Incore Instrumentation Thimbles) has been revised to require a sign-off from the rad-chem department, so that the rad-chem department will know when the status of the incore thimbles changes.
4. In operator training and re-training, special emphasis is being given on the incore instrumentation system and the radiation hazards associated with the reactor cavity during refueling.
5. Management effectiveness of the radiation-chemistry program has been improved by having the rad-chem foremen now report directly to the lead health physicist. During normal working days there is a meeting scheduled with the lead health physicist, a rad-chem foreman, the rad-chem supervisor, and the lead chemist (or their designees), at which time any special concerns for the day are brought up.
6. Radiation protection procedures on self reading dosimeters have been revised to require that a person wear a dosimeter with a range greater than the dose the person is expected to receive for the job, and that the range should be greater than the person's expected dose by at least 20%.

Corrective Action To Be Taken To Avoid Further Non-Compliance

1. The main door to the Unit 2 reactor cavity is now locked with a standard R-lock, but will be fitted with the special lock (already in place on Unit 1) prior to the next Unit 2 refueling outage. Although the reactor cavity blow-out doors are not normally used for personnel access, these doors will also be locked with the special locks during future refueling outages of either unit.
2. A status board showing the positions of the incore detectors and incore thimbles will be maintained in the rad-chem office during refueling outages.
3. In the past, a health physicist has usually attended refueling outage meetings. In the future, a rad-chem foreman will also be scheduled to attend the meetings.

Date When Full Compliance Be Met

Additional procedural controls have already been established to ensure rigid administrative control of entries into the reactor cavity area. The main door to the Unit 1 reactor cavity is now locked with a special lock. The licensee will be in full compliance by the next Unit 2 refueling outage, at which time the reactor cavity door on Unit 2 will be fitted with the special lock.

The July 9, 1982, letter from James G. Keppler to James J. O'Connor transmitting the notice of violation (reference (a)) referred to seven specific weaknesses in the radiation protection program that contributed to the incident. The statement of each alleged weakness and the steps Zion Station has taken or will take to remedy them follows below.

1. Lack of coordination between plant health physicist and rad-chem foremen in planning the entries.

Management effectiveness of the radiation-chemistry program has been improved by having the rad-chem foremen now report directly to the lead health physicist. The rad-chem foremen have been instructed on the importance of discussing jobs involving high levels of radiation with a health physicist. Under the new RWP program instituted July 1, 1982, a health physicist must sign off on jobs for which an individual could receive greater than 100 mrem/day. During normal working days, there is a meeting scheduled with the lead health physicist, a rad-chem foreman, the rad-chem supervisor, and the lead chemist (or their designees), at which time any special concerns for the day are brought up. In the past, a health physicist has usually attended refueling outage meetings. In the future, a rad-chem foreman will also be scheduled to attend the meetings.

2. Inadequate radiation surveys associated with the entries.

All the RCTs were spoken to on the importance of communicating thoroughly with the work crews and with rad-chem management before jobs begin. The importance of bringing to the job instruments of appropriate meter range was also stressed. At RCT re-training (July 26 - October 15, 1982), which new foremen will also attend, proper survey techniques will be further addressed.

3. Use of inexperienced rad-chem technicians to monitor the entries.

Rad-chem foremen will be encouraged to get out into the plant in more instances to aid the RCTs directly in covering jobs, including those tasks for which time-keeping is required. If, due to lack of experience or other reasons, a rad-chem foreman or health physicist has concerns about a particular RCT's ability to cover a certain job, a more experienced RCT will be assigned to cover the job. At least one ANSI-qualified rad-chem person is assigned to each shift.

4. Lack of understanding by radiation protection personnel of the reactor cavity radiological hazards including the radiation sources.

At RCT re-training (July 26 - October 15, 1982) all RCTs, rad-chem foremen, and health physicists will be taught about the incore instrumentation system and the special radiation hazards associated with the reactor cavity during refueling.

5. Inadequate training in reactor cavity radiological hazards even though a similar overexposure had occurred in 1976.

In addition to our response to item 4 above, in operator training and re-training, special emphasis is being given to the incore instrumentation system and the radiation hazards associated with the reactor cavity during refueling.

6. Failure of shift operations personnel in leadership positions to exhibit good radiation protection practices.

The person involved in the overexposure was spoken to specifically on the importance of always following the radiation protection standards. In operator training and re-training the importance of following all requirements of the radiation protection standards is being addressed. Under the new RWP program, an RWP is required to be filled out on all jobs for which a person could receive greater than 50 mrem/day.

7. Unavailability of survey instruments calibrated to greater than 50 R/h.

The rad-chem department has ordered two Eberline ionization detectors with lighted dials that can measure up to 100 R/h, and five more extendable GM detectors (Teletectors) that can measure up to 1000 R/h. They are expected to arrive by November 1, 1982. This would bring the station's current inventory of operable Teletectors to seven.

Reference (a) also suggested implementation of engineering controls, such as a camera monitoring system or a leak detection system, to eliminate the need to enter the reactor cavity when incore thimbles or detectors are withdrawn. We feel that such controls are not necessary because improved procedures and better access control now preclude anyone from entering the reactor cavity area when the incore detectors or thimbles are exposed. We have, however, modified the gaskets used on the excore instrumentation cover plates (the source of the leakage) to help minimize the possibility of future refueling cavity leaks.

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