Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

August 19, 1980

Mr. James G. Keppler, Director
Directorate of Inspection and
Enforcement - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Zion Station Units 1 and 2
Response to Health Physics Appraisal
IE Inspection Report Nos. 50-295/80-05
and 50-304/80-04
NRC Docket Nos. 50-295 and 50-304

References (a): June 27, 1980, letter from J. G. Keppler to J. J. O'Connor.

(b): July 18, 1980, letter from C. Reed to J. G. Keppler.

(c): May 14, 1980, letter from J. G. Keppler to C. Reed.

Dear Mr. Keppler:

Reference (a) transmitted an inspection report regarding an NRC conducted special appraisal of the health physics program at Zion Station during the period March 10 through March 21, 1980. That report identified four apparent items of noncompliance with NRC requirements. Commonwealth Edison Company's response to those items of noncompliance was contained in Reference (b).

Per Appendix A of Reference (a), the NRC staff also delineated several apparent significant weaknesses in our health physics program and requested Commonwealth Edison to provide the corrective steps taken or to be taken, including completion schedules. Commonwealth Edison's response to these items is contained in Attachment A to this letter.

Please address any additional questions that you might have concerning this matter to this office.

Very truly yours,

Cordell Reed

Cordell Reed
Vice President of
Nuclear Operations

Enclosure

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Attachment A

Response to Significant Appraisal Findings

The eight items identified as significant weaknesses requiring corrective action in Appendix A of the NRC letter dated June 27, 1980, are responded to in the following paragraphs. (Section references are to the Details portion of the NRC inspection report delineated above.)

Item 1

Management and management support of the health physics program should be strengthened. Particular attention should be given to communication, performance standards and review, morale and discipline, ALARA, and enforcement of radiation protection standards. (Sections 2 and 5)

Response

The following actions have been taken to improve management and management support of the health physics program.

1. The Rad/Chem Department is now represented in the station morning meetings. (Section 2.2)

2. Senior corporate management has reviewed the Rad/Chem organization and will hold discussions with the union regarding changes in existing practices. Organizational changes are anticipated by October 1, 1980. (Sections 2 and 5)

3. Pending implementation of a formal company-wide ALARA program, an interim ALARA committee will be initiated at Zion. Members of the committee will include the station superintendent, assistant superintendents, and selected radiation chemistry management personnel. The committee will review man-rem data, plan man-rem goals and implement actions to keep doses ALARA. The program will be inaugurated by September, 10, 1980. (Sections 2.4, 2.5, 2.6, and 5)

4. Radiation Chemistry Department personnel work performance will be evaluated annually. Performance problems will be reviewed with each radiation chemistry technician on a case by case basis. Discipline will be handled as specified in the union agreement. (Section 2.3)

5. The radiation chemistry foreman staff has been increased to 5 members. Plant surveillance is being stressed to enhance supervision of work performed by radiation chemistry technicians. Additional clerical help will be provided on an as needed basis to ensure ample time for foremen to perform the above function. The station will periodically reassess staffing needs and make changes as appropriate. (Section 2.3)

6. A radiation chemistry technician log was implemented on May 14, 1980, to enhance identification of significant items and follow their status. (Sections 2.3 and 2.5)

7. The Rad/Chem office area is being enlarged and redesigned to provide a better work environment. The tentative completion date is December 4, 1980. (Sections 2.3 and 2.4)

8. To ensure enforcement of the radiation protection standards all radiation occurrence reports will be reviewed by the Assistant Superintendent of Administration. Repeat offenders of the standards will be brought to the attention of the superintendent. (Section 2.4)

9. The company is developing a comprehensive training program for health physicists, chemists and technicians.

Item 2

Vandalism affecting the health physics program should be eliminated. (Sections 2.3 and 11.5)

Response

Vandalism affecting the health physics program has effectively been eliminated by establishing around the clock health physics supervision and by keeping the Rad/Chem Department laboratory, storage and office areas locked. Shiftly inspection of plant radiation protection equipment by supervisory personnel has ensured that operating equipment is in service at all times. In addition, security personnel will investigate each future case of suspected vandalism. (Sections 2.3 and 11.5)

Corrective action has been accomplished.

Item 3

The Radiation/Chemistry Department's emergency response capability needs significant improvement. Particular attention should be paid to training, procedures, facilities and equipment. (Sections 3.4, 4.3, 8.6, 8.7, 8.8, 9.4, 10, and 12)

Response

The extent of the emergency training offered to contractors and employees under NGET is consistent with the GSEP.

Quarterly drills have been conducted according to the GSEP to test various portions of the emergency response (i.e., assembly, communication, activation of support centers). In addition, elaborate annual drills have been conducted under the auspices of Radiation Management Corporation (RMC) to evaluate the station's response to an emergency. These drills require intimate involvement of the Radiation/Chemistry Technicians (RCTs). The drills assess the following parameters:

1. First-aid response of the RCTs;

2. Ability of RCTs to decontaminate an injured person;

3. The Rad/Chem Department response to an emergency;

4. The RCTs ability to work as a team;

5. The RCTs ability to assist the doctor at the hospital by providing the health physics expertise; and

6. The RCTs ability to assist the hospital with contamination control.

An extensive emergency drill was conducted on June 6, 1980, which necessitated high activity sampling, response to an off-scale effluent monitor and instructions to potential environs teams. (Section 3.4)

The new GSEP, which became effective on July 1, 1980, incorporates biannual health physics drills and annual environmental sampling drills. Future retraining programs and drills conducted at the station will concentrate on developing RCT involvement in the environmental sampling aspect of an emergency. These drills will present realistic scenarios needed to test and develop field procedures such as plume chasing, air sampling, etc. as well as communication capabilities. (Sections 3.4 and 8.7)

With regard to the interim emergency procedures specified by the TMI Lessons Learned Report (NUREG-0578), the Chemistry group provided additional training to the rad chem technicians, addressing in particular ZCP 500, "Post Accident Sampling and Analysis." (Section 3.4)

Procedures RP 1740-1, "Monitoring High Activity Releases During Accident Conditions", and RP 1740-3, "Radioiodine Sampling Under Accident Conditions", require that the noble gases entrained in the charcoal cartridge be removed prior to analysis. Contrary to the NRC observation, this is done using a vacuum system in the counting room and not compressed air. (Section 4.3)

ZCP 500, "Post Accident Sampling and Analysis", is concerned with sampling the reactor coolant system and containment atmosphere under accident conditions and addresses the concerns delineated in Section 4.3.

During an emergency the environmental monitoring contractor's duties are to frequent normal sampling stations and change filters, TLDs or gather liquid, soil, milk or grass samples at the frequency requested by the Environmental Director, who is under the guidance of the Illinois Department of Public Health (IDPH). They may also be instructed to place additional dosimeters in the field. (Section 8.7)

The counting room air conditioning system has had a newly designed air filter installed which results in a less restricted air flow. This filter is as efficient as the original and should result in better performance of the counting room ventilation system. (Section 10.2)

The purpose of the emergency trailer has been redefined to be that of a fixed, on site environment sampling location. Supplies and equipment will be maintained per the revised EPIP Appendix B. (Section 10.6)

The dumbwaiter shaft was checked and found to provide a substantial source of air supply to the sample room. The differential was checked between the hot lab and the dumbwaiter shaft and was found to be virtually zero. Thus, there is no air flow either in or out of the hot lab from the dumbwaiter shaft. (Section 10.7)

It was also determined that the pressure in the hot lab and the dumbwaiter shaft were higher than the sample room. Thus, it is highly unlikely that contamination will spread from the sample room to hot lab. (Section 10.7)

Item 4

Greater control of access to High Radiation Areas is required in order to avoid overexposures and to account for personnel. (Section 7.5).

Response

Zion Station agrees with the NRC observation that High Rad Control would be considerably simpler if the plant Technical Specifications contained the waiver to 10 CFR 20.203(c)(2) for areas below 1000 mrem/hr. A Technical Specification change to this effect will be submitted by November 1, 1980. In the interim, the station will continue to enforce the present R-key procedure.

Item 5

Radiation protection problems could occur, following a major reactor accident, in processing liquid radwaste in the currently used, temporary demineralizer system. This situation requires prompt correction, including completion of additional radwaste treatment facilities. (Section 11.3)

Response

As described in our responses to the NUREG-0578 "Lessons Learned" items (Reference: D. L. Peoples letter to H. Denton dated January 1, 1980), in the event of a major reactor accident, the containment is automatically isolated from most plant systems outside containment, including radwaste (NUREG-0578 Item 2.1.4). An effort has been made to reduce the potential for leakage outside containment from subsequent ECCS recirculation and sampling operations by the installation of a Leakage Reduction and Control Program for those systems outside containment that might contain highly radioactive fluids during post-accident recovery operations (NUREG-0578 Item 2.1.6a). As an additional precaution, an instruction will be placed in the Emergency Operating Procedures to isolate the portable demineralizer in the event of a LOCA. The existing radwaste evaporator, in conjunction with bulk solidification, will then be available as an alternate means of processing liquid radwaste.

Use of portable demineralizers during normal plant operations has been evaluated by the Station and deemed acceptable, in accordance with the requirements of 10 CFR 50.59. The use of temporary hoses to the portable demineralizers in the Auxiliary Building will be discontinued upon completion of the Radwaste Annex addition and associated hard piping. Installation of the portable demineralizer system and Radwaste Annex is scheduled for completion by October 31, 1980.

Item 6

There appears ample reason to suspect unmonitored leakage from the gaseous waste system, particularly from the cover gas system. Aggressive action is necessary to ensure gaseous radioactive waste system integrity. (Section 11.2)

Response

The Appraisal Section 11.2 on Gaseous Waste states the following: ". . . Licensee personnel believe they have a good estimate of system leakages and further believe that the gas system integrity is good. The Appraisal Team did not directly review the adequacy of the licensee's leak determination procedures. However, the team believes that the occasional presence of relatively short-lived noble gases in the Auxiliary Building discharge, together with the

low frequency (three in 1979, none since June) of gas decay tank releases indicate possibly substantial leakage from the cover gas system. . . "

In an effort to improve the capability of assessing gas system integrity, Zion Station will perform the following actions:

1. Daily balance checks of waste gas system volumes, already in progress, will be continued.

2. Nitrogen flow instrumentation will be installed to permit measurement of make-up to the cover gas system, in order to improve the accuracy and resolution of the gas volume balance checks. It is expected that this instrumentation will be installed by December 1, 1980.

Zion Station will investigate the Appraisal Team's assertion that the low frequency of gas decay tank releases is indicative of substantial leakage from the cover gas system. An investigation will be performed, utilizing a consulting engineer, into the present operatinal mode of the volume control tanks, whereby the tanks are isolated from the gas header. It is expected that preliminary results of this investigation will be available about October 1, 1980.

The March 18 event cited in the Appraisal was investigated and the cause determined on April 24, when a test of the RWST make-up line was performed. The problem was traced to a leaking valve in the CVCS system which allowed letdown water to flow to the RWST when the RWST was aligned for make-up. The valve was repaired and the problem corrected.

During the recent Unit 2 refueling outage, Zion Station investigated suspected gas leakage during Unit 2 dilution operations by conducting helium leak testing of the Unit 2 letdown line. Results of this testing indicated that there were no leaks in the letdown line. In addition, no gas leaks were observed during the dilution operations associated with Unit 2's return to power following the refueling outage. The Station will continue to monitor Unit 2 dilution operations for further symptoms of gas leakage, and will evaluate the need for additional leak testing.

Item 7

Contamination control should be improved in order to reduce the potential for personal exposure and inadvertent removal of contamination from controlled areas. (Sections 7.7 and 8.5)

Response

Zion Station agrees with the NRC observation that contamination control is the responsibility of all station personnel working in

controlled areas. In order to strengthen this policy the Training Department is giving added emphasis on this subject in their training classes. In addition, station management will enforce this policy through the radiation occurrence report mechanism. Contractor personnel who repeatedly violate this program will be discharged; union personnel will be handled under the bargaining agreement. (Sections 7.7 and 8.5)

Provided below are additional measures to enhance the contamination control program:

1. Effective July 31, 1980, the station has implemented a single access control point for the auxiliary building giving consideration to personnel accountability. However, multiple controlled access points may be established during outages.

2. Stationmen personnel are made available upon request by the Rad/Chem Department to maintain effective contamination control of all areas.

3. Periodic inspections of contractor gang boxes are being conducted to identify tools which require purple painting for contamination marking. A separate gang box has been designed for contaminated contractor tools. This box will be kept in a low traffic area and the exposure rate at contact will be kept minimal. Contrary to the NRC report, the Commonwealth Edison Maintenance Department has a high-level contamination tool storage room (560' Auxiliary Building). (This item was addressed in the Response to Notice of Violations).

4. Contamination surveys of the maintenance shop tool crib are being performed weekly. Periodic inspections of substation and contractor tool areas are also being emphasized.

5. The use of friskers for self monitoring at various step off pad locations in the plant was evaluated. In some circumstances, the general background exposure rate precludes effective use of these instruments. However, friskers are and were being used at locations other than the containment access point as implied in the audit report. In addition, a personnel frisker is now available at the Auxiliary Building hand and foot counter for personnel monitoring. All equipment or articles leaving the Auxiliary Building are surveyed by a technician.

6. The efficiencies of the portal monitors and hand and shoe counters were investigated. Procedures have been revised to provide better sensitivity checks and calibration for this equipment. It is noted that there are no regulatory

guidelines regarding the minimum sensitivity for this type of equipment. A sensitivity level of one microcurie is typical of the state of the art for these types of monitors.

In an effort to improve this sensitivity, Zion Station is purchasing a new type of portal monitor which utilizes two large liquid scintillation detectors (manufactured by Instrumental Research Technology Corporation). Although this equipment is designed to detect 1 μCi, Zion Station will obtain the equipment with minor design changes in an attempt to enhance the sensitivity to approximately 0.1 μCi. This new portal monitoring system is expected to arrive in November, 1980.

Item 8

The ability to sample, detect, and measure alpha activity in effluents and in plant environs should be improved. Surveillance for alpha activity should be increased. (Sections 8.4 and 9.7)

Response

Station health physics procedures address requirements for special transuranic analysis. Sample requirements include: spent demin resin from all radioactive systems including the spent fuel pool; and composite air particulate samples from the Fuel Building, Auxiliary Building (Radwaste) and containment including the cavity and fuel transfer canal area. The highest transuranic activity found in spent resin is approximately 2 nCi/g with typical activities showing less than 0.1 nCi/g. The highest activity found in air particulates is approximately 2×10^{-16} μCi/cc with typical activities showing less than 1×10^{-16} μCi/cc. In addition, health physics procedures require gross alpha measurements of all air samples. No significant activities have been found. (Section 8.4)

The uncertainties rased by the NRC regarding our in-house alpha counting capabilities were dispelled by Argonne National Laboratory's analysis. ANL analysis of samples confirmed the station's counting measurements, i.e., alpha activity was not a problem in liquid discharges. The NRC stated that "further technical work is needed to resolve questions regarding reliability of the alpha analysis." In this regard, a recent independent review of the station's alpha analytical techniques was performed by Commonwealth Edison offsite personnel. They concluded that no significant deficiencies exist. The three new gas flow proportional counters referred to in the audit have been received and are now being tested and calibrated prior to being placed in service. (Section 9.7)

As stated by the NRC, daily analysis of reactor coolant shows no evidence of fuel cladding failure past or present. Similarly, weekly gross alpha of reactor coolant shows no significant activity.

Sipping tests to date have not identified any appreciable fuel cladding leakage. Finally, gross alpha activity in the gaseous and liquid effluent streams has been insignificant.

In light of the one high activity sludge sample, the following additional surveillance items have been implemented:

1. The station is participating in a quarterly interlaboratory comparison program with the U.S. E.P.A. to demonstrate the analytical capability and performance of our counting room;

2. Weekly gross alpha analysis of spent fuel pool;

3. Transuranic analysis by private laboratory of:

   a. Lake Discharge Tank - quarterly composite;

   b. Spent Fuel Pool - quarterly; and

   c. Selected contamination smears, particularly from locations where alpha activity is suspected (e.g., cavity, fuel transfer canal, etc.) - semi-annually.