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**Commonwealth Edison**  
1400 Opus Place  
Downers Grove, Illinois 60515

May 25, 1994

Mr. William T. Russell, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Document Control Desk

Subject: Zion Station Units 1 and 2  
Control Room Habitability  
NRC Docket Nos. 50-295 and 50-304

- References:
- (a) August 6, 1991 letter from S.F. Stimac to T.E. Murley
  - (b) June 17, 1992 letter from S.F. Stimac to T.E. Murley
  - (c) September 1, 1992 letter from S.F. Stimac to T.E. Murley
  - (d) November 5, 1992 letter from S.F. Stimac to T.E. Murley
  - (e) September 1, 1993 letter from T.W. Simpkin to T.E. Murley

Dear Dr. Murley:

Commonwealth Edison Company (CECo) provided action plans for addressing the control room unfiltered air leakage concern at Zion via reference (a). These plans described the process CECo would utilize to demonstrate compliance with GDC-19 utilizing Standard Review Plan (SRP) methodology. References (b) and (c) provided updates to the status of implementation of these actions. Reference (d) transmitted the final analyses which demonstrated GDC 19 compliance without reliance on compensatory measures. Reference (e) forwarded a revised calculation which incorporated the results of the Containment Spray Nozzle testing completed at Sprayco and the detailed sprayed volume analysis performed.

The purpose of this letter is to provide the following:

- Attachment A: Additional Site Specific Information
- Attachment B: Revised Calculation ATD-190, "Control Room Habitability Radiological Dose Analysis" and Calculation ATD-0206 "Organic Iodine Spray Removal"
- Attachment C: Calculation ATD-0377, "RHR Pump Recirculation Flow."
- Attachment D: Calculation ZI-3-36 Rev. 1, "Calculation of Post LOCA Iodine Spray Removal Rate" and Calculation ZI-5-91 Rev. 0, "Control Room Infiltration Study."

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PDR ADOCK 05000295  
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A003

Mr. Russell

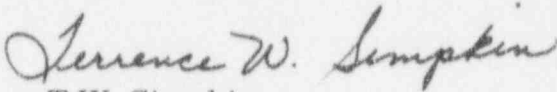
- 2 -

May 25, 1994

Attachments A and D respond to a telephonic information request. Attachments B and C are necessitated by the revision of the containment spray pump starting time and the revision to the containment spray flow rates during the recirculation phase.

CECo personnel are available to meet with the Staff to discuss any specific questions related to this matter. Please direct any questions to this office.

Sincerely,

  
T.W. Simpkin  
Nuclear Licensing Administrator

Attachments

cc: J.B. Martin, Regional Administrator - RIII  
C.Y. Shiraki, Project Manager - NRR  
J.D. Smith, Senior Resident Inspector - Zion

ATTACHMENT A  
ADDITIONAL SITE SPECIFIC INFORMATION

## Facility description

- 1a. Identify all accident source term release points, e.g., turbine building vents, atmospheric steam dumps, containment, etc. For each release point, give its distance and direction in degrees true from the EDG air intake, other turbine building intakes and the control room intake. For the containment, give two distances, from the nearest point on the exterior of the containment and from the center point of the dome. State the release point dimensions and release conditions (flow rates and temperature). In addition, provide any variation in release condition values that are a function of season. Include the elevations of the intakes and the release points from a common point of reference.

## Response

The release points from Zion Station are the Aux Building Vent Stack Unit 2, the Unit 2 Containment, and the RWST for Unit 2 which is located near the Unit 2 Containment Structure at the Aux Building Roof Elevation. Attached is a sketch identifying the distances requested for each release point to the 2A EDG intake.

## **Release Points**

The Aux Building vent stack flowrate typically varies from 75,000 CFM (one Fan) in the winter to a maximum of 150,000 CFM (Two Fans) in the summer. This flow is also modulated for pressure control. The temperature leaving the aux building is typically 10°F above the ambient in summer months and approximately 80°F in winter months. The vent stack is an 8 foot diameter stack at elevation 772'6".

The RWST Release is not a forced release by a fan and is assumed to be released based upon displacement of a volume in the tank. The elevation of the release point is approximately elevation 638'.

## **Intake Points**

The EDG Intake is located at ground elevation 592'. The EDG fan flowrate also varies based on modulation and can be off if the EDG is not running. However as a conservative measure the fan was operated with the vanes open during the in-building dilution testing. The maximum flow of the EDG vent fan is 70,000 CFM, which would be expected during summer months with the engine operating. The low flow might be as low as 20,000 CFM during winter months with the EDG in operation. With EDG off, the flow would be zero.

The Control Room Ventilation Intake for the Emergency Intake is located in the Turbine Building at elevation 592 + 15 feet along G line wall. The normal intake is isolated by redundant bubble tight dampers. The makeup flow is between 1600 and 2200 CFM depending on filter pressure drop.

- 1b. For each of the release points intakes in Item 1.a. above, provides, if applicable, the vent height above the top surface of the building. For the intakes provide the flow rates under normal and accident conditions, if they are different. If they are the same, so state.

#### Response

Depending on which building in question, the height above the Auxiliary Building vent stack release point is different. The top of the Auxiliary Building is elevation 643' near the vent stack and the Control Room roof is elevation 668'. The top of the Containment Dome is elevation 779'8". The top of the Turbine Building is elevation 712'. The flows are as stated above.

The RWST release points is not above the top surface of any building.

#### **Meteorological**

- 2a. Provide, on 3.5 inch disks, in ASCII format, the meteorological data that have been collected at the Zion site for five years or for the period of time since such data have been collected. The data should include the data for the 35 foot elevation and other elevations near the release points and the EDG air intake elevations. Also, provide the heights of the meteorological instrumentation on the towers.

#### Response

This information has been provided to the Project Manager. The information has been previously docketed in the form of summaries included with the Annual Environmental Reports.

- 2b. Provide, in terms of distance and degrees true, the locations of the meteorological towers from the intakes and release points in Item 1.a above.

#### Response

The meteorological tower location is approximately 2000' from the EDG intake at an angle of 37.4° from the east west Base Line shifted to be along the EDG intake wall. The enclosed sketch illustrates the location of the tower.

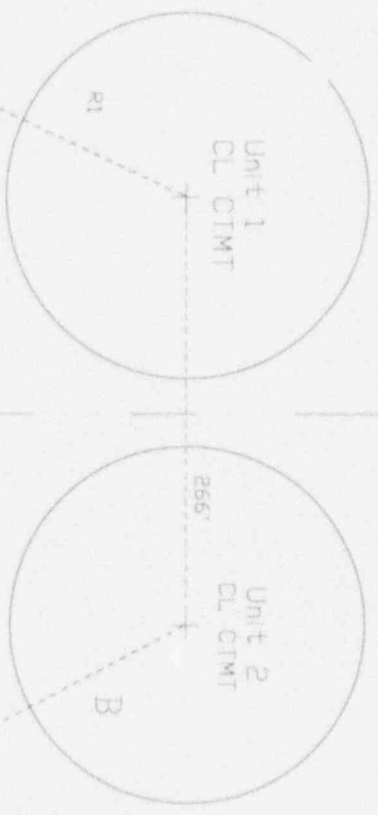
- 2c. Based on the Control Room Habitability study, it appears that the EDG air intake is west of the Unit 2 vent and the containment release points, but that winds from the east off the lake were not considered in the study. This interpretation, if correct, would minimize the concentrations at the EDG air intake. Is this interpretation correct? Specify at which unit a LOCA would result in the lower concentrations at the EDG air intake.

Response

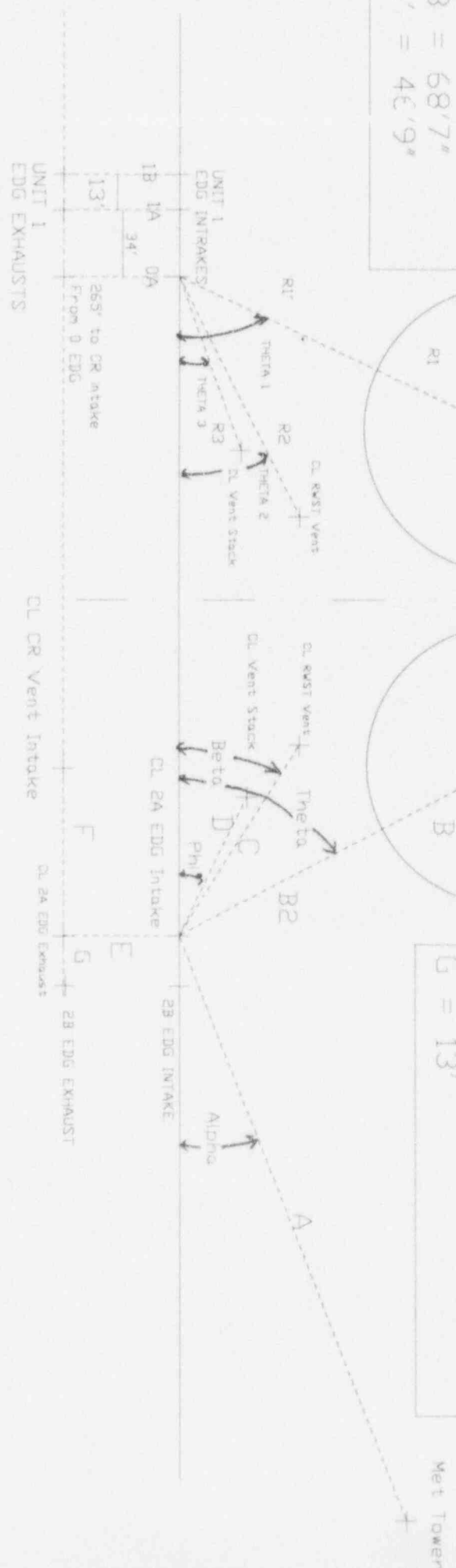
The EDG air Intake is actually east of the Unit 2 Containment. Therefore, the interpretation appears to be incorrect. A LOCA on Unit 1 is expected to result in lower concentrations at the 2A EDG intake since it is further away than Unit 2. For the Analysis, the Unit 2 LOCA was considered since its source was closest to the Control Room Emergency Intake which is located on the Unit 2 side of the turbine building. The flowpath from the containment to the Unit 2A EDG was the closest intake relative to the Control Room Intake and the Unit 2 Containment.

THETA 1 = 75.73  
 THETA 2 = 32  
 THETA 3 = 31.4  
 R1 = 121'9"  
 R2 = 91'6"  
 R3 = 68'7"  
 R1' = 46'9"

UNIT 1 SIDE      UNIT 2 SIDE



A = 2000' ALPHA = 37.4  
 B = 134'3" THETA = 61.52  
 B2 = 59'3"  
 C = 122' BETA = 23.4  
 D = 99'3" PHI = 21.1  
 E = 42'  
 F = 95'8"  
 G = 13'



PLAN VIEW SKETCH

NOT TO SCALE

Prepared by: Bill Perchiazzi *BP*  
 Checked by: *S. Berchowski* 5-19-94

ATTACHMENT B

Calculation ATD-190 Rev. 3  
"Control Room Habitability Radiological Dose Analysis"

and

Calculation ATD-0206 Rev. 2  
"Organic Iodine Spray Removal"



**SARGENT & LUNDY****ENGINEERS**

FOUNDED 1881

95 EAST MONROE STREET

CHICAGO, ILLINOIS 60603

(312) 269-2000

GERALD P. LAHTI  
ASSOCIATE  
312 269-3964

October 4, 1993

Commonwealth Edison Company  
Zion Station

Release of calculations to the NRC

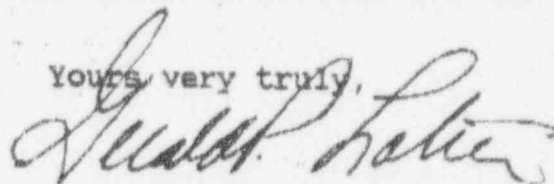
Mr. William T. Perchiazzi  
Commonwealth Edison Company  
1400 Opus Place  
Downers Grove, IL 60515

Dear Mr. Perchiazzi:

Because of the clause at the bottom of our S&L calculation forms (see attached example), you asked if S&L permission was necessary prior to releasing copies of our calculations to the Nuclear Regulatory Commission (NRC). I offer the following clarification. This clause is intended to apply to the S&L standard GES-320.10 which contains the forms rather than the calculations which use the forms. This oversight in the pre-printed forms will be corrected in future releases.

Thus, you do have permission to copy the subject Zion Station calculations for the NRC.

Yours very truly,



G. P. Lahti  
Associate and Manager  
Nuclear Technology

GPL:dlb

cc: R. A. Hameetman  
N. Weber  
B. C. Schwartz

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Post-It™ brand fax transmittal memo 7671		# of pages 2
To	Clude Shranki	From
Co.	NRC	Co.
Dept.	Projects	Phone #
Fax #	301 504 3861	Fax #
		108 663 7279
		709 663 7155



March 31, 1994  
Project No. 9140-98  
File No. 3.2  
(DIT-ZI-EXT-1115)

Commonwealth Edison Company  
Zion Station - Units 1 & 2  
TRANSMITTAL OF CALCULATIONS ATD-0190, REV. 3  
AND ATD-0206, REV. 2  
MODIFICATION NO.: N/A  
SYSTEM CODE: CS

Mr. W. T. Perchiazzi  
Nuclear Engineering Department  
Commonwealth Edison Company  
1400 Opus Place  
Downers Grove, Illinois 60515

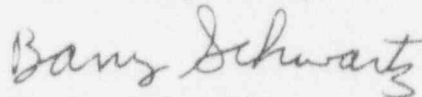
Dear Mr. Perchiazzi:

This External Design Information Transmittal (EDIT) transmits Sargent & Lundy (S&L) Calculations ATD-0190, Revision 3, and ATD-206, Revision 2.

The location of the calculation purpose, design input, assumptions and approach are referenced in this EDIT.

If you have any questions, please feel free to contact me at (312)269-3915.

Yours very truly,



B. C. Schwartz  
Senior Principal Engineer

BS:en

Copies:

Addressee	(1 ltr/1 calc)
J. Ashley	(1/1)
CHRON System	(1/1)
W. C. Cleff/P. A. Gazda/R. A. Hameetman	(1/0)
J. S. Steele	(1/0)
G. P. Lahti/N. Weber/W. J. Johnson	(1/0)
J. A. Kowalski/File 3.2	(1/0)

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**STATUS OF INFORMATION:**

APPROVED  
 PRELIMINARY  
 REFERENCE/INFORMATION ONLY  
(not for design purposes)

SAFETY RELATED  
 NON-SAFETY RELATED  
 REGULATORY RELATED

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**IDENTIFICATION OF THE SPECIFIC DESIGN INFORMATION TRANSMITTED AND PURPOSE OF ISSUE** (List any supporting documents attached to DIT by its title, revision and/or issue date, and total number of pages for each supporting document.)

This EDIT transmits to Commonwealth Edison Company (CECo) the following calculation revisions:

1. Calculation ATD-0190, Revision 3, Approved March 31, 1994, "Control Room Habitability Radiological Dose Analysis" 18 Pages

The purpose, design input, assumptions and approach are found in the following calculation sections:

Purpose	Section 1.0
Design Input	Section 2.0
Assumptions	Section 3.0
Approach	Section 4.0

2. Calculation ATD-0206, Revision 2, Approved March 31, 1994, "Organic Iodine Recirculation Spray Removal" 6 Pages

The purpose, design input, assumptions and approach are found in the following calculation sections:

Purpose	Section 1.0
Design Input	Section 2.0
Assumptions	Section 3.0
Approach	Section 4.0

**SOURCE OF INFORMATION**

Calc. No. Noted Above - Report No. N/A -

Other N/A

<u>B. C. Schwartz</u>	<u>ATD</u>
Preparer	Division
<u>W. E. DeLise</u>	<u>ATD</u>
Reviewer	Division
<u>W. J. Johnson</u>	<u>ATD</u>
Approver	Division

*B. C. Schwartz*  
Preparer's Signature  
*W. E. DeLise*  
Reviewer's Signature  
*B. C. Schwartz for W. J. Johnson*  
Approver's Signature

3-3-94  
Date  
3-31-94  
Date  
3-3-94  
Date