

FAX FORM  
ADVANCED MEDICAL SYSTEMS, INC.121 North Eagle Street  
Geneva, OH 44041  
Phone: (216) 466-4671  
FAX: (216) 466-0186TO: MR. JOHN A. GROBE, CHIEF  
NUCLEAR MATERIALS INSPECTION  
SECTION II - USNRC, REGION IIIFROM: DAVID CESAR  
TREASURER

FAX NO.: (708) 515-1259

DATE: FEBRUARY 1, 1995

PAGE 1 OF 14

SUBJECT: OHIO EPA RISK ANALYSIS

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Attached is the Risk Analysis performed by John Wills of the Ohio EPA which indicates there is virtually no risk to the general public from a release of dispersible radiological matter at London Road.

If you have any questions, please do not hesitate to contact me.

DC/mz  
Attachments

B/37

# EPA RECOMMENDED PROTECTIVE ACTIONS GUIDES FOR EARLY PHASES OF A NUCLEAR INCIDENT

## CAUTION:

Reactor licensees should continue to use the PAGs specified in Table I-2 unless they have revised their Emergency Plans to adopt the new PAGs (Table I-1). For non-reactor nuclear incidents, base protective actions on Table I-1 or for  $UF_6$  releases on the guidance in Section E.

## NOTE:

Table I-1 PAGs published in 1991 are based on the sum of the effective dose equivalent resulting from external exposure and the committed effective dose equivalent from inhalation. Additional guidance is provided on thyroid or skin exposures. In contrast, the PAGs in Table I-2 are based on the external gamma dose from plume exposure and the committed dose to the thyroid from inhalation. Thyroid dose is the controlling factor for severe reactor accidents for both sets of PAGs.

Table I-1: PAGs<sup>a</sup> for the Early Phase of a Nuclear Incident

Protective Action	PAG Projected Dose	Comments
Evacuation <sup>b</sup> (or sheltering)	1-5 rem <sup>c</sup>	Evacuation (or for some situations, sheltering <sup>b</sup> ) should normally be initiated at one rem.
Administration of stable iodine	25 rem <sup>c</sup>	Requires approval of State Medical Officials

<sup>a</sup>EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, 1991

<sup>b</sup>Sheltering may be the preferred protective action when it will provide protection equal to or greater than evacuation, based on consideration of factors such as source term characteristics, and temporal or other site-specific conditions.

<sup>c</sup>The sum of the effective dose equivalent resulting from exposure to external sources and the committed effective dose equivalent incurred from all significant inhalation pathways during the early phase. Committed dose equivalents to the thyroid and to the skin may be 5 and 50 times larger, respectively.

<sup>d</sup>Committed dose equivalent to the thyroid from radioiodine.

E-10

Table E-1

RELATION OF WEATHER CONDITIONS TO  
STABILITY CLASSES

Beaufort Scale for Windspeeds

<u>Observations</u>	<u>Windspeed</u>	
	<u>m/sec</u>	<u>mph</u>
Smoke rises vertically	0.3	1
Smoke drift gives direction but wind not felt on face	1.0	1-3
Wind felt on face, leaves rustle vane moved by wind	2-3	4-7
Leaves and twigs in constant motion wind extends flag	4-5	8-11
Moves dust, loose paper and small branches	6-7	12-16
Small trees in leaf begin to sway	8-9	17-22
Large branches in motion; high wires whistle	10-12	23-27

Stability Classes

<u>Atmospheric Condition</u>	<u>Stability Class</u>
Low wind speed (< 2m/s) at night	E-F
Typical	D
Partly cloudy with low winds or Sunny with high winds	B-C
Very low (< 2m/s) windspeed on a bright summer day	A

\*Source: NUREG-1062.

Summary of ST-DOSE Inputs 01/30/95 10:37

Title: AMS release of 29 Ci in 1 hour Straight-Line Plume  
 Plant & Unit: NO PLANT SELECTED UNIT 1  
 Release Height: 0 M Building Waver: Y Calculation Radius: 25 mi (40 km)

event	date	time	Meteorological Data					
Shut Down								
Rel->Cont			date	time	winds	stb	mix	precip
Rel->Envi	02/03/95	08:00	1 02/03/95	08:00	0 : 6 MPH	F	500 M	NONE
Rel End	02/03/95	09:00	2					
Expos End	02/03/95	09:00	3					
			4					

Source Term: Isotopic Release Rates  
 Units: Ci/sec  
 Co-60 8.06E-003

Plume Model Maximum doses at selected distances (rem)

Distance (miles)	.5	1.0	2.0	5.0
(km)	.8	1.6	3.2	8.0
Acute Bone Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total EDE (EPA)	4.4E-02	2.9E-02	2.2E-02	1.2E-02
Thyroid (EPA)	1.1E-02	7.5E-03	5.7E-03	3.2E-03
Acute Lung	9.2E-03	6.0E-03	4.5E-03	2.6E-03

Acute Bone Total = Acute Bone Inh. + Cloud Shine + Init. Ground Shine  
 Total EDE = Cloud Shine + 4-Day Ground Shine + CEDE Inhalation

Acute Bone Inhalation	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cloud Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Initial Ground Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
4-Day Ground Shine	2.1E-03	1.4E-03	1.0E-03	0.0E+00
CEDE Inhalation	4.2E-02	2.8E-02	2.1E-02	1.2E-02

NOTE: All values below 1.0E-03 have been set to zero.

## Summary of ST-DOSE Inputs

01/30/95 10:37

Title: AMS release of 29 Ci in 1 hour

Straight-Line Plume

Plant &amp; Unit: NO PLANT SELECTED UNIT 1

Release Height: 0 M Building Waze: Y Calculation Radius: 25 mi (40 km)

event	date	time	Meteorological Data			
Shut Down						
Rel->Cont						
Rel->Env:	02/03/95	08:00	1	02/03/95	08:00	0 : 6 MPH F 500 M NONE
Rel End	02/03/95	09:00	2			
Expos End	02/03/95	09:00	3			
			4			

Source Term: Isotopic Release Rates

Units: Ci/sec

Co-60 8.06E-003

## Plume Model

Maximum doses at selected distances (rem)

Distance (miles)	0.5	1.0	2.0	5.0
(km)	0.8	1.6	3.2	8.0
Acute Bone Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total EDE (EPA)	4.4E-02	2.9E-02	2.2E-02	1.2E-02
Thyroid (EPA)	1.1E-02	7.5E-03	5.7E-03	3.2E-03
Acute Lung	9.2E-03	6.0E-03	4.5E-03	2.6E-03

Acute Bone Total = Acute Bone Inh. + Cloud Shine + Init. Ground Shine  
 Total EDE = Cloud Shine + 4-Day Ground Shine + CEDE Inhalation

Acute Bone Inhalation	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cloud Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Initial Ground Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
4-Day Ground Shine	2.1E-03	1.4E-03	1.0E-03	0.0E+00
CEDE Inhalation	4.2E-02	2.8E-02	2.1E-02	1.2E-02

NOTE: All values below 1.0E-03 have been set to zero.

Title: AMS release of 29 Ci in 1 min. Puff Model  
Plant & Unit: NO PLANT SELECTED UNIT 1  
Release Height: 0 M Building Wake: Y Calculation Radius: 10 mi (16 km)

event	date	time	Meteorological Data			
Shut Down						
Rel->Cont						
Rel->Envi	02/03/95	08:00	1	02/03/95	08:00	0 6 MPH F 500 M NONE
Rel End	02/03/95	08:01	2			
Expos End	02/03/95	08:01	3			
			4			

Source Term: Isotopic Release Rates  
Units: Ci/sec  
Co-60 4.83E-001

# Puff Model

Maximum doses at selected distances (rem)

Distance (miles)	.5	1.0	2.0	5.0	10.0
(km)	.8	1.6	3.2	8.0	16.1
Acute Bone Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
4/24 m Total EDE (EPA)	4.4E-02	2.9E-02	2.2E-02	0.0E+00	0.0E+00
Thyroid (EPA)	1.1E-02	7.5E-03	5.7E-03	0.0E+00	0.0E+00
Acute Lung	9.2E-03	6.0E-03	4.5E-03	0.0E+00	0.0E+00

Acute Bone Total = Acute Bone Inh. + Cloud Shine + Init. Ground Shine  
Total EDE = Cloud Shine + 4-Day Ground Shine + CEDE Inhalation

Acute Bone Inhalation	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cloud Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Initial Ground Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
4-Day Ground Shine	2.1E-03	1.4E-03	1.1E-03	0.0E+00	0.0E+00
CEDE Inhalation	4.2E-02	2.8E-02	2.1E-02	0.0E+00	0.0E+00

NOTE: All values below 1.0E-03 have been set to zero.



Summary of ST-DOSE inputs:

01/30/95 10:24

Title: AMS basement release of 15 Ci in 1 min.

Puff Model

Plant &amp; Unit: NO PLANT SELECTED UNIT 1

Release Height: 0 M Building Waker Y Calculation Radius: 10 mi (16 km)

event	date	time	Meteorological Data			
Shut Down						
Rel->Cont						
Rel->Envi	02/03/95	08:00	1	02/03/95	08:00	winds stb mix precip
Rel End	02/03/95	08:00	2			0.6 MPH F 500 M NONE
Expos End	02/03/95	08:00	3			
			4			

Source Term: Isotopic Release Rates

Units: Ci/sec

Co-60 2.50E-001

Puff Model

Maximum doses at selected distances (rem)

Distance (miles)	.5	1.0	2.0	5.0	10.0
(km)	.8	1.6	3.2	8.0	16.1
Acute Bone Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total EDE (EPA)	2.3E-02	1.5E-02	1.1E-02	0.0E+00	0.0E+00
Thyroid (EPA)	5.9E-03	3.9E-03	2.9E-03	0.0E+00	0.0E+00
Acute Lung	4.8E-03	3.1E-03	2.3E-03	0.0E+00	0.0E+00

Acute Bone Total = Acute Bone Inh. + Cloud Shine + Init. Ground Shine  
 Total EDE = Cloud Shine + 4-Day Ground Shine + CEDE Inhalation

Acute Bone Inhalation	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cloud Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Initial Ground Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
4-Day Ground Shine	1.1E-03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
CEDE Inhalation	2.2E-02	1.4E-02	1.1E-02	0.0E+00	0.0E+00

NOTE: All values below 1.0E-03 have been set to zero.

Summary of ST-DOSE inputs

01/30/95 10:15

Title: AMS basement release of 15 Ci over 1 hr  
 Plant & Unit: NO PLANT SELECTED UNIT 1  
 Release Height: 0 M Building Waker Y Calculation Radius: 25 mi (40 km)  
 Straight-Line Plume

Event	date	time	Meteorological Data			
Shut Down						
Rel->Cont						
Rel->Envi	02/03/95	08:00	1	02/03/95	08:00	winds stb mix precip
Rel End	02/03/95	09:00	2			0 0 MPH F 500 M MODER RAIN
Expos End	02/03/95	09:00	3			
			4			

Source Term: Isotopic Release Rates  
 Units: Ci/sec  
 Co-60 4.17E-003

## Plume Model

Maximum doses at selected distances (rem)

Distance (miles) (km)	0.5 0.8	1.0 1.6	2.0 3.2	5.0 8.0
Acute Bone Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total EDE (EPA)	3.3E-02	1.9E-02	1.0E-02	2.0E-03
Thyroid (EPA)	5.0E-03	2.7E-03	1.4E-03	0.0E+00
Acute Lung	4.0E-03	2.2E-03	1.1E-03	0.0E+00

Acute Bone Total = Acute Bone Inh. + Cloud Shine + Init. Ground Shine  
 Total EDE = Cloud Shine + 4-Day Ground Shine + CEDE Inhalation

Acute Bone Inhalation	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cloud Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Initial Ground Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
4-Day Ground Shine	1.5E-02	9.0E-03	4.9E-03	1.0E-03
CEDE Inhalation	1.8E-02	9.9E-03	5.2E-03	0.0E+00

NOTE: All values below 1.0E-03 have been set to zero.



Summary of ST-DOSE Inputs 01/30/95 10:10

Title: AMS basement release of 15 Ci over 1 hr  
 Plant & Unit: NO PLANT SELECTED UNIT 1  
 Release Height: 0 M Building Wake: Y Calculation Radius: 25 mi (40 km)  
 Straight-Line Plume

Event	date	time	Meteorological Data				
Shut Down							
Rel->Cont							
Rel->Envl	02/03/95	08:00	1	02/03/95	08:00	winds stb mix precip	
Rel End	02/03/95	09:00	2			0 16 MPH F 500 M	NONE
Expos End	02/03/95	09:00	3				
			4				

Source Term: Isotopic Release Rates  
 Units: Ci/sec  
 Co-60 4.17E-003

# Plume Model

Maximum doses at selected distances (rem)

Distance (miles)	.5	1.0	2.0	5.0
(km)	.8	1.6	3.2	8.0
Acute Bone Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Total EDE (EPA)	2.3E-02	1.5E-02	1.1E-02	6.4E-03
Thyroid (EPA)	5.9E-03	3.9E-03	2.9E-03	1.7E-03
Acute Lung	4.8E-03	3.1E-03	2.3E-03	1.3E-03

23 miles from Reactor

Acute Bone Total = Acute Bone Inh. + Cloud Shine + Init. Ground Shine  
 Total EDE = Cloud Shine + 4-Day Ground Shine + CEDE Inhalation

Acute Bone Inhalation	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cloud Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Initial Ground Shine	0.0E+00	0.0E+00	0.0E+00	0.0E+00
4-Day Ground Shine	1.1E-03	0.0E+00	0.0E+00	0.0E+00
CEDE Inhalation	2.2E-02	1.4E-02	1.1E-02	6.1E-03

NOTE: All values below 1.0E-03 have been set to zero.



# Northeast Ohio Regional Sewer District

26 Euclid Avenue • Cleveland, Ohio 44115-2504  
VIA FACSIMILE

216 • 881 • 6600

FAX: 216 • 881 • 9709

February 1, 1995

John Grobe, Chief  
Nuclear Materials Inspection Section 2  
U. S. Nuclear Regulatory Commission  
Region III  
801 Warrenville Road  
Lisle, Illinois 60532-4351

Re: Advanced Medical Systems

Dear Mr. Grobe:

I am in receipt of a copy of your letter of February 1, 1995 to Mr. David Cesar of Advanced Medical Systems in which you discuss release criteria for sanitary discharge of Cobalt-60. As has been made abundantly clear to you, the District will not accept any discharges from this licensee which harbor any detectable Cobalt-60 whatsoever.

You should be aware that our refusal is not based on Nuclear Regulatory Commission regulations, but is instead founded upon the interference that Cobalt-60 creates at our facilities. As you should also be aware, the study conducted by Pacific Northwest Laboratories, "Reconcentration of Radioactive Material Released to Sanitary Sewers in Accordance with 10 CFR 20", indicates that interferences may be caused by either soluble or insoluble radionuclides.

We remain ready to discuss these matters in more detail with you. Please call me or Tom Lenhart at (216) 881-6600 should you require clarification of the above.

Very truly yours,

William B. Schatz  
General Counsel

cc: Martha McCorkle  
Michael Kalstrom  
Gary Shear, NRC Region III  
Erwin Odeal  
Richard Connelly  
Thomas Lenhart

6/3/8

FEB 6 1995