



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

January 31, 1980

Marvin I. Lewis  
6504 Bradford Terrace  
Philadelphia, Pennsylvania 19149

Dear Mr. Lewis:

Pursuant to our telephone conversation today, I am enclosing copies of the original Executive Summary of TMI-1 and TMI-2 radioactive liquid and gaseous releases as a result of the TMI-2 accident on March 28, 1979. These copies are more legible than the ones sent with our response to your interrogatories on January 28, 1980.

I am also enclosing the signed affidavits to accompany those interrogatories.

Sincerely,

*Lucinda Low Swartz*  
Lucinda Low Swartz

Enclosures: As stated

cc with enclosures: Service List

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*Jay Y. Lee*

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Jay Y. Lee  
Senior Nuclear Engineer  
NRC/TMI Technical Support Staff  
ONRR/NRC

*John T. Collins*

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John T. Collins  
Deputy Director  
NRC/TMI Technical Support Staff  
ONRR/NRC

Sworn and subscribed before me,  
a Notary Public in and for the  
County of Dauphin, Commonwealth  
of Pennsylvania, this 28 day  
of January 1980.

*Cathy L. Brey*

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CATHY L. BREY, Notary Public  
Londonderry Twp., Dauphin County, Pa.  
My Commission Expires Oct. 24, 1980

My Commission expires

Jay Y. Lee  
Professional Qualifications  
TMI Technical Support  
NRC Recovery Operations Office  
Office of Nuclear Reactor Regulation

My name is Jay Y. Lee. I am a senior nuclear engineer in the TMI Technical Support of the NRC Recovery Operations Office at the Three Mile Island Nuclear Station. I was detailed to this position on April, 1979 as a member of the Task Force for TMI Support. In this position, I perform technical reviews, analyses, and evaluations of the recovery operations for TMI-2, the restart programs for TMI-1, and the TMI-2 Reactor Containment Building entrance program.

Prior to this assignment, I was a senior nuclear engineer in the Effluent Treatment Systems Branch in the Office of Nuclear Reactor Regulation, I was responsible for Technical reviews, analyses, and evaluations of reactor plant systems and equipment for fission product removal and treatment of radioactive wastes, as to the adequacy of provisions in meeting the applicable regulations. I am also responsible for the derivation of models used in the calculation of source terms to estimate the radiological impact on the environment, the adequacy of the instrumentation provided for maintaining radioactive discharges from nuclear power plants and for providing technical bases for guides and standards.

I received a Bachelor of Science degree in Chemical Engineering from the University of Minnesota in 1962 and a Master of Science degree in Nuclear Engineering from the Catholic University of America.

My professional experience totals approximately 17 years of design, construction, start-up, operation, and licensing of central station nuclear power plants.

From 1962 to 1966, I was employed as the plant chemical engineer by Northern States Power Company at Pathfinder Atomic Power Plant (decommissioned). In this position, I was responsible for operation and maintenance of radwaste treatment systems and for the implementation of the occupational health and effluent and environmental monitoring programs.

From 1966 to 1969, I was a nuclear systems engineer with Bechtel Corporation at San Francisco. In this position, I was responsible for technical review of the design and construction of reactor plant systems of central station nuclear power plants.

From 1969 to 1974, I was employed as the senior chemical engineer by Sacramento Municipal Utility District at Rancho Seco Nuclear Generating Station. In this position, I was responsible for design reviews, construction, and start-up operation of the radwaste treatment systems and the plant secondary system.

In 1974, I accepted the position of senior nuclear engineer with the U. S. Nuclear Regulatory Commission.

John T. Collins, Jr.  
Professional Qualifications  
NRC Recovery Operations Office  
Office of Nuclear Reactor Regulation

My name is John T. Collins, Jr. I am the Deputy Director of the NRC Recovery Operations Office at the Three Mile Nuclear Station. I was appointed to this position on May 31, 1979, as part of the interim organization within the Office of Nuclear Reactor Regulation. In my present capacity as the senior NRC official onsite I am responsible for the supervision of all technical activities performed by the onsite professional staff of the Office of Nuclear Reactor Regulation and for the supervision of all surveillance and enforcement activities performed onsite by the professional staff of the Office of Inspection and Enforcement.

In addition to this assignment, I am also Chief of the Effluent Treatment Systems Branch in the Office of Nuclear Reactor Regulation. In this position I am responsible for planning, organizing, directing and supervising the activities of the branch in performing technical reviews, analyses and evaluations of reactor plant systems and equipment for fission product removal and treatment of radioactive wastes, as to the adequacy of provisions in meeting the applicable regulations. I am also responsible for the derivation of models used in the calculation of source terms to estimate the radiological impact on the environment, the adequacy of the instrumentation provided for maintaining radioactive discharges from nuclear power plants and for providing technical bases for guides and standards.

I attended Idaho State University and Pennsylvania State University majoring in general engineering. I also took special courses in ventilation engineering and industrial hygiene engineering at Michigan State University and North Carolina State University.

My professional experience totals approximately 25 years of which more than 21 have been concerned with occupational health and safety and treatment of radioactive wastes.

From 1954-1957, I was employed as a laboratory technician by Goodyear Atomic Corporation at the Portsmouth Gaseous Diffusion Plant. From 1957-1963, I held the position of Industrial Hygiene Engineer in the Nuclear Division of the Beryllium Corporation, Hazelton, Pennsylvania. In this position, I was responsible for the design, installation, operation and maintenance of filtration and waste treatment systems and for the implementation of the occupational health and effluent and environmental monitoring programs.

In 1963, I accepted the position of Industrial Hygiene Engineer with the AEC's Idaho Operations Office, Idaho Falls, Idaho. In this capacity, I was responsible for the appraisal of AEC contractor's programs at the National Reactor Testing Station in the areas of occupational health, pollution abatement, waste management and effluent monitoring. In April 1971, I transferred to the Division of Waste Management and Transportation, AEC Headquarters, Washington, DC, as a Materials and Process Engineer. In November 1971 I was detailed to the Regulatory Division as Lead Nuclear Engineer in the Effluent Treatment Systems Branch, Directorate of Licensing. In April 1975, I was appointed Chief of the Effluent Treatment Systems Branch.

I am a member of the American Industrial Hygiene Association and the American Nuclear Society. I have served on various ANS Working Groups for the development of ANSI Standards related to systems for the processing of radioactive liquid and gaseous wastes. I am presently a member of ANS 40.1 Working Group to develop a standard for volume reduction systems for use in nuclear power plants. I am also a member of the ASME Radwaste Committee and serve on the Committee on Nuclear Air & Gas Treatment Systems. In addition, I am a member of NCRP Scientific Committee-41, Radiation Generated In Nuclear Fuel Cycle Facilities. Over the past five years I have served on various IAEA Technical Committees and presently serve on the Committee on Removal, Storage and Disposal of Gaseous Radionuclides from Airborne Effluents from Nuclear Facilities.

## EXECUTIVE SUMMARY

## THREE MILE ISLAND UNITS I and II LIQUID and GASEOUS RELEASES

DISCHARGE PATHWAYS	1st	Incident				2nd
	Quarter	Period	4/1/79 to	5/1/79 to	6/1/79 to	Quarter
	1/1/79 to	3/28/79 to	4/1/79 to	5/1/79 to	6/1/79 to	4/1/79 to
	3/31/79	3/31/79	4/30/79	5/31/79	6/30/79	6/30/79
<b>I. Liquid Released:</b>						
a) Discharge less Tritium:						
1) Concentration ( $\mu\text{Ci}/\text{cc}$ )	1.29E-8 (a)	7.44E-8 (a)	1.75E-7 (a)	2.89E-8 (a)	2.84E-8 (a)	8.63E-8 (a)
2) Total Activity (Ci)	0.277E0 (b)	1.00E-1 (b)	1.62E0 (b)	2.21E-1 (b)	1.88E-1 (b)	2.03E0 (b)
b) Iodine-131 Released:						
1) Concentration ( $\mu\text{Ci}/\text{cc}$ )	4.97E-9 (a)	7.16E-8 (a)	1.70E-8 (a)	2.25E-9 (a)	5.60E-10 (a)	7.57E-9 (a)
2) Total Activity (Ci)	0.107E0	9.62E-2	1.57E-1	1.72E-2	3.70E-3	1.78E-1
c) Tritium Released:						
1) Concentration ( $\mu\text{Ci}/\text{cc}$ )	4.83E-6 (a)	5.13E-7 (a)	8.45E-7 (a)	7.05E-7 (a)	4.60E-7 (a)	6.77E-7 (a)
2) Total Activity (Ci)	104.1E0	0.69E0	7.80E0	5.38E0	3.04E0	1.59E1
<b>II. Airborne Iodine Released:</b>						
a) Quarterly Release Rate ( $\mu\text{Ci}/\text{sec}$ )	5.8E-1	5.8E-1	1.20E0	9.89E-3	2.12E-5	1.22E0
b) Total Iodine-131 Released (Ci)	4.57E0	4.57E0	9.48E0	7.8E-2	1.67E-4	9.6E0
<b>III. Noble Gases Released:</b>						
a) Quarterly Release Rate (Ci/sec)	1.12E0	1.12E0	1.4E-1	1.81E-4	9.5E-5	1.41E-1
b) Total Noble Gases Released (Ci)	8.83E6	8.83E6	1.11E6	1.43E3	7.50E2	1.11E6

## FOOTNOTES:

- a) Concentrations are based upon actual MDCT flows. These are concentrations in the effluent averaged over the period.
- b) This data includes Iodine-131 released to the Susquehanna River as a result of the TMI Unit II accident on March 28, 1979.

## EXECUTIVE SUMMARY

## THREE MILE ISLAND UNITS I and II LIQUID and GASEOUS RELEASES

DISCHARGE PATHWAYS	7/1/79 to	8/1/79 to	9/1/79 to	3rd Quarter
	7/31/79	8/31/79	9/30/79	7/1/79 to 9/30/79
<b>I. Liquid Released:</b>				
a) Discharge less Tritium:				
1) Concentration ( $\mu\text{Ci}/\text{cc}$ )	1.12E-8 (a)	2.66E-9 (a)	2.33E-9 (a)	5.18E-9 (a)
2) Total Activity (Ci)	7.85E-2 (b)	1.89E-2	1.78E-2	1.13E-1
b) Iodine-131 Released:				
1) Concentration ( $\mu\text{Ci}/\text{cc}$ )	4.57E-10 (a)	9.10E-11 (a)	8.62E-11 (a)	2.07E-10 (a)
2) Total Activity (Ci)	3.20E-3	6.46E-4	6.59E-4	4.51E-3
c) Tritium Released:				
1) Concentration ( $\mu\text{Ci}/\text{cc}$ )	7.20E-7 (a)	3.20E-7 (a)	3.34E-7 (a)	4.53E-7 (a)
2) Total Activity (Ci)	5.04E0	2.27E0	2.55E0	9.86E0
<b>II. Airborne Iodine Released:</b>				
a) Quarterly Release Rate ( $\mu\text{Ci}/\text{sec}$ )	1.58E-6	<MDA	<MDA	1.58E-6
b) Total Iodine-131 Release (Ci)	1.24E-5	<MDA	<MDA	1.24E-5
<b>III. Noble Gases Released:</b>				
a) Quarterly Release Rate (Ci/sec)	1.27E-5	1.14E-5	8.88E-6	3.30E-5
b) Total Noble Gases Released (Ci)	100	90	70	260

## FOOTNOTES:

- a) Concentrations are based upon actual MDCT flows. These are concentrations in the effluent averaged over the period.
- b) This data includes Iodine-131 released to the Susquehanna River as a result of the TMI Unit II accident on March 28, 1979.

## EXECUTIVE SUMMARY

## THREE MILE ISLAND UNITS I and II LIQUID and GASEOUS RELEASES

DISCHARGE PATHWAYS	10/1/79 to	11/1/79 to	12/1/79 to	4th Quarter
	10/31/79	11/30/79	12/31/79	10/1/79 to 12/31/79
I. Liquid Released:				
a) Discharge less Tritium				
1) Concentration ( Ci/cc)	1.25E-9			
2) Total Activity (Ci)	9.29E-3			
b) Iodine-131 Released				
1) Concentration ( Ci/cc)	4.89E-11			
2) Total Activity (Ci)	3.62E-4			
c) Tritium Released:				
1) Concentration ( Ci/cc)	7.61E-7			
2) Total Activity (Ci)	5.64E0			
d) MDCT Flow For Month (cc)	7.41E-12			
II. Airborne Iodine Released:				
a) Quarterly Release Rate ( Ci/sec)	<MDA			
b) Total Iodine-131 released (Ci)	<MDA			
III. Noble Gases Released:				
a) Quarterly Release Rate (Ci/sec)	9.51E-6			
b) Total Noble Gases released (Ci)	75			

## FOOTNOTES:

a) Concentrations are based upon actual MDCT flows. These are concentrations in the effluent averaged over the period.