Enclosure 4

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Department of Nuclear Engineering
Massachusetts Institute of Technology

Cambridge Massachusetts 02139-4307
Room 24-102
(617)253-4206
Fax (617)258-7437

Mujid S. Kazimi
Professor and Department Head

February 10, 1994

Dr. Ivan Selin
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Re: "The Chernobyl Accident Revisited: Source Term Analysis and Reconstruction of Events During the Active Phase," by Alexander R. Sich

Dear Dr. Selin:

The enclosed report may contain information of interest to you. Some of the contents may have come to your attention through some press reports. We are making a copy available to you to facilitate a more complete review of the information.

We welcome your comments which can be directed to me or to Professor Norman Rasmussen.

Sincerely,

Mujid S. Kazimi

MSK:ewp
enclosure as stated
xc: N. Rasmussen

Table VI.15

Estimated Activity Releases from Chernobyl
[radionuclides with significant half-lives ($t_{1/2} \geq 1$ day)]

1	2	3	4	5	6	7	8	9	10	11	12	13
Basic / Initial (t = 0) Data				Fuel-Containing Materials (FCMs)				Central Hall & Outside Reactor Building				Total
Isotope	Half-life	Activity (MCi)	Mass (kg)	fractional contribution	fractional release	fractional (1 - plateout)	release (MCi)	fractional contribution	fractional release	fractional (1 - plateout)	release (MCi)	Release (MCi)
Ru-103	39.25 d	102	3.2	0.71	0.95	??	??	>0.2	??	??	??	??
Ru-106	372.56 d	23.2	7.0	0.71	0.95	??	??	>0.2	??	??	??	??
Te-129m	33.6 d	28.1	0.93	0.71	(0.50)	(0.5)	5	>0.2	(0.30)	(0.9)	1.5	6.5
Te-132	78.03 h	121	0.40	0.71	(0.50)	(0.5)	21.5	>0.2	(0.30)	(0.9)	6.5	28
Te-134	41.8 min	208	0.0062	0.71				>0.2				
I-129	1.57 e7 y	(2.0 e-5)	(11.3)	0.71	(0.50)	(0.5)	–	>0.2	(0.50)	(0.9)	–	–
I-131	8.04 d	83.2	0.67	0.71	(0.80)	(0.5)	23.6	>0.2	(0.50)	(0.9)	7.5	31.1
I-132	2.284 h	121	0.021	0.71				>0.2				
I-133	20.8 h	181	0.16	0.71	(0.80)	(0.5)	51.4	>0.2	(0.50)	(0.9)	16.3	67.7
I-134	52.6 min	208	0.0078	0.71				>0.2				
Cs-134	2.062 y	4.6	3.5	0.71	0.65	(0.5)	1.1	>0.2	(0.30)	(0.9)	0.2	1.3
Cs-136	13.16 d	169	2.3	0.71	0.65	(0.5)	39	>0.2	(0.30)	(0.9)	9.1	48.1
Cs-137	30.0 y	7	80.4	0.71	0.65	(0.5)	1.6	>0.2	(0.30)	(0.9)	0.4	2
Cs-138	32.2 min	177	0.0042	0.71				>0.2				
Cs-139	9.27 min	167	0.0017	0.71				>0.2				
Total		1600	110				143				41.5	185

NOTE: Figures in parentheses are conservative estimates; shaded radionuclides have ($t_{1/2} < 1$ day).

Columns 1 - 7: FCM = Fuel-Containing Materials, i.e., that portion of the core currently located in the lower regions of the reactor building.

Columns 8 - 11: Central Hall & Outside Reactor Building = that portion of the core located on the floor of the Central Hall, outside the reactor building but within the bounds of the station, and beyond the bounds of the station.

fractional contribution: Mass fraction of the entire core contributing to this release.

fractional release: Fractional release from that portion of the fuel (as obtained or estimated from chemical analyses).

fractional (1 - plateout) release: Fraction that escaped from the fuel and debris into the environment.

= (Initial Activity) × (fractional contribution) × (fractional release) × (fractional (1 - plateout)).