UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 17, 1995

MEMORANDUM TO: Chairman Jackson
Commissioner Rogers

FROM: James M. Taylor
Executive Director for Operations

SUBJECT: INVESTIGATION OF A PHOSPHOROUS-32 INTERNAL CONTAMINATION AT THE CANCER RESEARCH CENTER, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, BOSTON, MASSACHUSETTS

On Monday, October 16, 1995 at 10:15 a.m., the Radiation Safety Officer (RSO) for the Massachusetts Institute of Technology (MIT) informed Region I that on August 19, 1995 a male researcher at a laboratory in the MIT Cancer Research Center was found to have had an uptake of phosphorus-32 (P-32). The researcher discovered the uptake during a routine closeout survey of his work area on Saturday evening, August 19, 1995. The researcher concluded that the high background radiation in the laboratory was being caused by his internal radioactive contamination.

MIT radiation safety officials initiated surveys later in the evening on August 19, 1995 of the laboratory work areas, the individual's home and his family members with negative results. Urine samples and whole body counting of the contaminated individual and articles of clothing were also initiated. The licensee believes that the researcher was internally contaminated on August 14, 1995. Other personnel in the laboratory were evaluated for contamination on Monday, August 21, 1995 with negative results. The licensee has accounted for all P-32 material except for about 500 microcuries based on an inventory and records of its use in the laboratory.

Analysis of urine and samples over a six-week period and whole-body scans conducted by the licensee has led the licensee to conclude the individual's uptake had been a maximum of 579 microcuries. At the individual's request, an outside expert is reviewing the data and licensee assessment to determine whether appropriate samples were taken, if analyses were done correctly, and whether the assessment is reasonable. The licensee has provided NRC with a copy of the report of their assessment which was released to the contaminated individual during the week of October 9, 1995. A copy of the report from the outside expert will be provided to NRC Region I as soon as it is received by MIT.

The individual also reported the internal contamination to the MIT Campus Police and alleged that the contamination could not be explained by normal handling. The Campus police are reviewing the information. MIT will issue a press release.

MH 5-3-3 DF03
X-IDAR-12.
X-OAM-6 Commission

Incident Investigation Team Charter

PHOSPHOROUS-32 INTERNAL CONTAMINATION
AT THE CANCER RESEARCH CENTER,
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, BOSTON, MASSACHUSETTS

The scope of the investigation should include: incident chronology; source of the P-32 and contamination characterization; analysis of actual and potential dose consequences; radiation safety program; event reporting and licensee response; an evaluation of potential wrongdoing at the center; and whether the NRC's regulatory process and activities preceding the event contributed to it. Within the framework of this overall scope the IIT should specifically:

With respect to the incident chronology; develop a probable sequence of events associated with the P-32 internal contamination including its probable source; handling and movement within the center; and ingestion circumstances.

With respect to the P-32 source and contamination characterization: determine the quantity and chemical form of the radioactive material ingested, whether any other individuals were contaminated, and any external contamination associated with the event.

With respect to analysis of the actual and potential dose consequences: evaluate the intake and the resulting internal dose received by the researcher (and any others who may have been contaminated) as a result of the ingestion or external contamination, and the potential health consequences, (if any); and assess exposures (if any) to any other individuals who were associated with the center from the time of discovery of the cancer researcher's internal contamination.

With respect to the radiation safety program: evaluate the licensee's program at the center for P-32 including material accounting; controlling access and use; evaluate the use of surveys for detecting contaminations and procedures for responding to P-32 contaminations.

With respect to event reporting and licensee response evaluate the actions taken by the licensee to: report the contamination to the NRC; assess contamination of individual(s) including medical followup and mitigation treatments; assess the extent of any other associated contaminations at the center and offsite; and prevent additional similar events. Provide input to Region I to evaluate continued operations of the center.

With respect to potential wrongdoing at the center: evaluate whether and the nature of any intentional actions by one or more individuals to cause the contamination.

With respect to the NRC's regulatory process and activities: evaluate the regulatory controls concerning this type of event.

Attachment

Because the incident involves circumstances which are not well enough understood, and involves characteristics, the investigation of which would best serve the needs and interests of the Commission, I have requested AEOD to establish an NRC Incident Investigation Team (IIT). The IIT is to: (a) fact-find as to what happened, (b) identify the probable cause or causes as to why it happened, and (c) make appropriate findings and conclusions which would form the basis for any necessary follow-on actions. The IIT charter is attached. Based on the initial assessment by the team, it is possible that the investigation could be downgraded to an AIT.

The team will report directly to me and is comprised of: John Glenn (RES), IIT Leader; Larry Robinson (Office of Investigations, Region II); Elizabeth Ullrich (Region I); Sami Sherbini (NMSS); and Alan Madison (AEOD). Contractor support will provide additional technical expertise, as necessary. Because of the limited number of technical experts able to investigate an event of this type, some team members have had previous inspection involvement at the facility. The IIT was selected on the bases of their knowledge and experience in the fields of medical physics, health physics, laboratory radiation safety procedures and investigations. All team members are relieved of all normal duties while assigned to the IIT.

The Commonwealth of Massachusetts has been notified of the event. NRC Region I and the Office of Public Affairs are prepared to respond to media interest. NRC Region I initiated an immediate inspection at MIT to follow-up on the licensee's actions in assessing this contamination event. This inspection has been subsumed by this IIT. Region I remains responsible for any enforcement or other actions resulting from this investigation.

The licensee has agreed to preserve the biological samples taken from the contaminated individual until the team has had an opportunity to evaluate the event. The licensee's actions have been confirmed by the Region in a Confirmatory Action Letter which was issued on October 17, 1995.

The IIT report will constitute the single NRC fact-finding investigation report. It is expected that the IIT report will be issued within about 45 days from the time the team exits from the site.

Attachment: As stated

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