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Massachusetts Institute of Technology
Exit Interview

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ADDENDUM/ERRATA SHEET

Page	Line	Correction and Reason for Correction
		No comments on this document

Page 4 Date 11/13/95 Signature [signature]

ADDENDUM/ERRATA SHEET

Page	Line	Correction and Reason for Correction
2	15	"opened" should be "open" as in "open to the public".
7	2	"100 to 2090" should be "100 to 200" - based on my notes in preparation for the exit
7	23	"vile" should be "vial" similar sounding words

Page _____ Date 10/27/15 Signature John E. Glenn

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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INCIDENT INVESTIGATION TEAM

+ + + + +

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

+ + + + +

WEDNESDAY, OCTOBER 25, 1995

NRC STAFF PRESENT:

JOHN GLENN

ALAN MADISON

SAMI SHERBINI

BETSY ULLRICH

ALSO PRESENT:

DAVE LITSTER

FRANK MASSE

MITCH GALANEK

CHRIS DALY

DANIEL FLYNN

JENNIFER GOREN

P-R-O-C-E-E-D-I-N-G-S

(10:05 A.M.)

MR. GLENN: I'd like to begin the exit interview at this time. Good morning. My name is John Glenn, and I represent the Nuclear Regulator Commission's Incident Investigation Team, which is reviewing a P-32 internal exposure, which occurred to an MIT researcher this last August.

This is an exit interview with MIT. And at the conclusion -- it's at the conclusion of our initial on-site activities. This does not conclude the activities of the team itself, but we will be leaving and going back to our headquarters organization at this point.

This is an exit interview with MIT. It is opened, but members of the public will -- are invited to be here as observers. However, the exit being between the two of us, during the exit itself, I ask that you only observe and not ask questions.

However, at the close of the exit, I will invite questions from people in the audience and try to respond as well as I can.

I will note that the meeting is being transcribed, and a copy of the transcript will be available after the team has completed its report, which might be 40, 45 days from now.

Just for the record, I'll note that today is October 25th. It's approximately 10:05 in the morning. And as I said, I'm John Glenn. I work normally in the NRC's Office of Regulatory Research.

And at this time, I'd like the representatives of MIT who will be participating in the exit interview to identify themselves and their position.

MR. LITSTER: Yes, I am David Litster, Professor of Physics and Vice President for Research at MIT.

MR. MASSE: I am Frank Masse. I'm MIT's Radiation Protection Officer.

MR. GLENN: Okay. Just to remind MIT, and to also inform members of the public who may be attending, I will recap just a little bit of the history and purpose of the incident investigation team.

The team was formed on October 17th and arrived at MIT the same day. The decision to form an IIT was based on MIT's notification to our Region I Office on October 16th about an internal exposure to P-32 which occurred last August.

Although this reported intake of P-32 would not result in an exposure in excess of NRC limits, the report at whole body dose was close to the annual limit. And the circumstances of the exposure included the

possibility that the individual was deliberately exposed.

Further, ingestion of such a large quantity of P-32 is rare. And this is the second such event in a few months.

As we indicated at our entrance interview, the purposes of the team are to establish what happened, to identify probable causes, and to document our findings and conclusions, and issue a report in about 45 days.

The purpose of this team is not to perform an inspection and make findings in terms of compliance or non-compliance nor to find fault in terms of the people who may have been responsible for this.

I will also mention that a representative from the Commonwealth of Massachusetts has been an observer of all activities of the team while we've been here.

I would like to express my appreciation to MIT for th cooperation that they have extended to us. You have made facilities and equipment available to us to do our work. You have made space available so we can interview employees.

MIT personnel have been very responsive. When we've asked for interviews, people have shown up. And you have accommodated our schedule to a very large degree.

I would also like to thank the individuals who participated in those -- these interviews for their candor

and cooperation with us during the process.

The people that we interviewed were people that might have first-hand knowledge either about the incident itself or about the Radiation Protection Program here at MIT.

These individuals included the exposed individual, workers in the Cancer Center, Radiation Protection Office staff and managers, campus police who responded to the incident, and members of the Radiation Protection Committee. And we appreciate the cooperation of all of those people.

The scope of the investigation includes an incident chronology, which we are also asked to see if we can find out the source of the P-32 to characterize the contamination, to look at the analysis of actual and potential dose consequences, the effectiveness of the Radiation Protection Program, and event reporting and Licensee response.

In addition, as we go on to the other phases of this investigation, we will be looking at the NRC's regulatory process and it's activities preceding the event, and whether any of our rules, regulations, and procedures may have contributed in any way to this incident.

Although we are concluding the on-site phase

of the investigation, we're still in the early stages of our analysis and development of probable cause and consequences. And I will not be discussing conclusions at this exit interview.

However, I would like to share with you some of the major features of our preliminary chronology of events based on the records that you have provided to us and the interviews that we have conducted.

We have noted that the exposed individual worked with P-32 on August 14th, that he performed surveys of himself, and reported no contamination.

That's important because later information indicates that may have been the date that the uptake had occurred.

The individual then next worked with P-32 on August 19th. He performed a survey and he found that his whole body was apparently contaminated.

He notified the campus police who took him to the Medical Center where he was examined by a physician.

The Radiation Protection Office was informed and responded and began surveys of the individual, the laboratory, the floors, benches, halls, and no contamination was found.

Urine analysis was begun for this individual, and activity was detected that same night. Initial

estimates by the Radiation Protection Office of activity ingested were in the 100 to 2090 microcuries range.

In addition, the individual's apartment was surveyed, and no additional contamination was found.

On Monday, August 21st, there were additional lab surveys performed. And again, no contamination was found.

Urine samples were requested from 24 workers in the same laboratory that day. And the exposed individual also brought in some clothing from home, which was sorted by day, and small contamination was found on clothing worn beginning August 14th through August 18th, but not on clothing that was worn on Saturday the 12th or Sunday the 13th.

The urine analysis for the other workers did not reveal any other contamination of individuals as a part of this incident.

On Tuesday, August 22nd, authorization to use radioactive material in the involved laboratory was suspended, and an inventory of P-32 was requested.

The results of that inventory were that 51.7 microliters of P-32 solution could not be accounted for; 37 microliters was missing from a vile that was received on August 14th.

The unaccounted activity was estimated to be

approximately 500 microcuries.

At the same time, based on your whole body counting and urinalysis to that point, the Radiation Protection Office estimated the intake could be as high as 500 microcuries.

On Thursday, August the 31st, you permitted the laboratory to begin use of radioactive material again. However, the conditions of use have been changed so that only three individuals were responsible for dispensing and recordkeeping for the material.

On Tuesday, the 12th of September, the Radiation Protection Committee met and discussed the incident. After that meeting, the campus police were asked to assist in the investigation.

On Thursday, the 12th of October, the Rad Protection Office provided a dose assessment to the exposed individual. And that dose estimate had numbers as high as 579 microcuries.

On Monday the 16th, MIT notified the NRC of the event.

There has been one change since we arrived here in the scope of this investigation. Based on the sequence of events as we had developed them by Friday, October 20th, and based on the lack of contamination or other evidence of an accidental spill of radioactive

phosphorous 32, the team could not eliminate that a potential cause of the incident was a deliberate contamination of food or drink ingested by the individual.

On this basis, NRC management decided that the NRC's Office of Investigations should pursue the matter of potential wrongdoing; i.e., a deliberate contamination.

The incident investigation team's charter was modified to remove a task relating to wrongdoing. And the member of the IIT from the Office of Investigations was removed from the team.

The Office of Investigations has initiated a separate investigation, and I will not be reporting on that.

The team's principal contacts at MIT were informed of this change on Friday. The IIT's charter still requires that the team evaluate MIT's program at the Cancer Center for material counting and controlling access to areas.

In addition, the team will evaluate the NRC's regulatory controls concerning this type of event.

I will mention one observation of the team. The team observed and were told in its interviews that during off hours, certain areas in which radioactive material is stored or used can be entered without a key and without being challenged.

We were also told that MIT's policy was to require that such buildings be locked in off-hours, and that radioactive material use areas are to be locked, except when authorized individuals are in attendance.

The team's principal contacts at MIT were informed of these observations on Monday, the -- this Monday on the 23rd. And these contacts informed the team on Tuesday of additional actions being taken to ensure security of radioactive materials against unauthorized removal.

The NRC's Region I Office will monitor and review the adequacy of these corrective actions.

What happens next? The team will continue to gather information through interviews with NRC staff and review of documents. The team has contracted for independent analysis of urine specimens that have been held by MIT for the team, and also MIT's whole body counting data will be reviewed.

This will be reviewed by two national laboratories that we have under contract to us.

We will also, as a team, analyze the information that we have collected to determine probable cause and to develop conclusions. Within 40 to 45 days of our returning to our office, we will publish the results of this evaluation and we'll brief the Commission on our

findings.

In addition, recommendations for actions by the NRC staff will likely result from this analysis.

Finally, I would like to indicate how certain items that you agreed to a [illegible] which were confirmed in a letter signed by Thomas T. Martin may be closed.

First with respect to the issues of security of material, Region I will monitor your actions that you have taken. And you will be contacting them and they will be contacting you with respect to those matters.

With respect to the urine samples that you are holding, you may dispose of the remaining material once the NRC's contractor has, you know, tested the samples and dispensed, labelled and shipped the samples to the testing laboratory.

So once that is done, you no longer need to hold that material.

Records which you have provided copies to us will no longer need to be protected. However, if you identify records which do bear upon the investigation and which neither you identified and reported to us nor did we identify as records that we were interested in, as you come across those records, we would appreciate it if you would notify and provide copies to us.

We have requested many records during the last

week, plus most of them have been supplied. My understanding is that before we leave, we will have all those records.

If we fail to, in fact, get all the records we have requested, again we hope that you will expeditiously provide those records to us.

But I think it's down to one or two this morning that we had not gotten as yet.

That concludes my remarks. If you have a statement or questions at this time, I would be pleased to listen.

MR. LITSTER: Thank you, Mr. Glenn. I have very little to add to what you have said, but I do believe that it's in all of our interests to understand as fully as we can what happened and to take whatever steps are necessary to make it unlikely that such an event can recur.

And as you know, we have already begun to reexamine our procedures and policies and see if there are ways in which they could be improved.

And we look forward to hearing the conclusions of your report.

MR. GLENN: Okay, thank you very much. And Mr. Masse?

MR. MASSE: Yes, I'd like to just suggest one

clarification, John, in what you reported. I think you implied, and correct me if I'm wrong, that the campus police were not notified until the notification by the Radiation Protection Committee.

Indeed, they had been notified within the first few days. And the Radiation Protection Committee reinforced the recommendation to the campus police that this be thoroughly investigated.

MR. GLENN: Okay, I appreciate that clarification. It was not my intent to imply that there might not have been an additional notification, but to take note that the committee did, in fact, recommend, yes.

Okay, at this point, I will close the exit interview. And I am now open to questions from members of the public and the audience.

If you do have a question, I would request that you come up to the microphone, identify yourself and your affiliation when you ask the question.

MR. DALY: Mr. Glenn, I'm Chris Daly from the Washington Post. And we have so many questions, I don't really know where to begin. But is it possible to say any more about what happened on August 14th?

MR. GLENN: Not at this time. Again, this is at the very early stage of this incident investigation team's analysis. We are not prepared to make conclusions

about -- I think I outlined the major facts that have been gathered up to this point.

But in terms of conclusions, we are not prepared to state any conclusions at this time.

MR. DALY: Well, do you know where this exposed individual and his colleagues in that lab stored their food and their lunch boxes and that sort of thing?

MR. GLENN: Well yes, we have looked at that. And there were clean areas for food to be stored and food to be eaten. And we have looked at the issue of whether those areas were violated and whether there were sometimes people eating in the laboratory.

But I'm not prepared to give a conclusion at this time.

MR. DALY: Aha, okay. And do you have any -- is there anything you can say further about the "why" of this? I gather that you haven't ruled anything in or out. But is that true? Have you been able to exclude any possibilities?

MR. GLENN: Well, we cannot exclude. But I think if you listen to the facts, as I related to them, the things we would expect to see in an accidental spill --

MR. DALY: Yes.

MR. GLENN: -- we did not see. We did not see

laboratory contamination. We did not see contamination in the home. We did not see contamination in other individuals.

MR. DALY: Yes.

MR. GLENN: So some of the things we would expect to see in an accidental spill were not there.

MR. DALY: I see. So if there were a splash, let's say -- I'm coming at this as a layman, but was this in a liquid form?

MR. GLENN: Yes, the material is normally kept -- it is a liquid form. It is normally kept frozen. But when it is thawed out, it is a liquid and it can be dispensed as a liquid.

MR. DALY: I see. So if there had been an accident, you would expect some stuff to be around the area?

MR. GLENN: Around, right. That's essentially the --

MR. DALY: And is there any reason to think that this was self-inflicted poisoning?

MR. GLENN: That's why our Office of Investigations is looking at this to find out what the cause is. We have not come to any conclusions about the cause.

MR. DALY: Okay. Have you, in your experience

or in your agency's records, ever come across a similar episode?

MR. GLENN: I'm sure you're aware that, and I mentioned it in my opening remarks, that there was a similar incident at NIH earlier this summer.

In looking back through our records, there have been rare occasions when other ingestions have occurred. I do not remember the precise date now, but there was one at Brown University in Rhode Island in the early 80's.

MR. DALY: Oh, so they're that rare that they are one or two a decade?

MR. GLENN: Of this type that I'm aware of, yes.

MR. DALY: And what were the similarities between this episode and the incident at the NIH this summer? I'm not familiar with that earlier one.

MR. GLENN: The similarities that I'm aware of are that they both involve P-32. They both involved ingestion. The magnitude of the dose is comparable in both cases.

There are some differences. I guess that -- my understanding is that at NIH, that there was some contamination found of some equipment in a water cooler in the laboratory.

MR. DALY: Okay.

MR. GLENN: We found nothing like that here.

MR. DALY: And I guess this is an obvious question, but are there any overlap of personnel in these two incidents?

MR. GLENN: Is that in terms of the NRC or --

MR. DALY: No, no, no. I mean, the people who worked in those two labs.

MR. GLENN: Not that I'm aware of.

MR. DALY: Okay, but can you rule it out? I mean, do you know positively that --

MR. GLENN: No.

MR. DALY: -- no one worked in both situations?

MR. GLENN: No.

MR. DALY: Okay. And do you know -- can you tell us anything about the exposed individual's labmates and colleagues, and who are they? What do they work on? What sort of enterprise was involved?

MR. GLENN: Okay, the laboratory where they work is a laboratory that is involved in molecular biology or neural biology.

And the P-32 is used to label the sequences of DNA basically. I'm not an expert in terms of the types of research that they do. But it is that kind of research in

molecular biology, working with DNA and genetic traits and that sort of thing.

MR. DALY: I see. And was the exposed individual an experienced researcher?

MR. GLENN: Yes.

MR. DALY: Someone who would know how to handle this material?

MR. GLENN: Yes.

MR. DALY: Okay. And did he suffer any medical consequences?

MR. GLENN: The individual did report symptoms. I will note that at the dose levels that we're talking about, 579 microcuries, which in terms of dose to an individual would translate into approximately 4.8, 4.9 REM of effective dose equivalent.

That's the amount of dose that a worker is permitted to receive within one year. We would not expect to see significant medical -- or we wouldn't expect to see medical consequences at that level of exposure. But --

MR. DALY: But even when an annual dose is concentrated into a period of --

MR. GLENN: At the 5 REM level, we would not expect to see what are called "deterministic effects," where you would actually be able to observe physical symptoms.

MR. DALY: Oh, okay. I thought I heard somewhere that the fellow reported vomiting and aches and pains and some symptoms.

MR. GLENN: Again, I think I have said that he did report some symptoms.

MR. DALY: And can you characterize -- can you specify those?

MR. GLENN: I think that may get into an area of privacy of the individual, so I guess I'd prefer not to. I think you have seen an article where I guess the individual has been quoted. And I guess I would refer you to that.

MR. DALY: Okay. But were there anything about his symptoms that you found suggestive or indicative --

MR. GLENN: At this point, we have not made any conclusions about that. I will mention that we do have a medical consultant to the incident investigation team, Dr. Daniel Flynn, and he will be advising us on that.

MR. DALY: Okay. I guess my final question is to try to ask in plain English, what happened here?

MR. GLENN: I think I've told you what we know. In fact, the individual did obviously ingest approximately, you know, 600 microcuries of P-32.

It was detected, apparently detected, within a week of the exposure; that there is no radiological evidence that any other person was exposed as a result of the incident.

MR. DALY: Yes.

MR. GLENN: And I think at this point, that's all I can really conclude about the incident.

MR. DALY: Fair enough. Thank you.

MR. GLENN: Thank you.

MS. GOREN: Hi. I'm Jennifer Goren from WBUR Radio. I have a couple of questions. First of all, in regard to the symptoms, did the researcher report the symptoms, report having symptoms before he found out that he had been contaminated?

MR. GLENN: Not that I'm aware.

MS. GOREN: Okay. And in the case of the researcher who was contaminated at NIH, did this researcher have the same type of symptoms? You said it was a similar case.

MR. GLENN: I really don't have that information.

MS. GOREN: Okay. And is that -- do you have any information on whether that researcher is continuing to have any effects, whether there have been any long-term effects, although it's only been a couple of months?

MR. GLENN: Again, this gets sort of into the confidential -- you know, the medical confidentiality of the individual. So I would prefer not to comment on that.

MS. GOREN: Okay, I'm not asking specifically which effects, but whether there are effects, which is a little bit less personal.

MR. GLENN: I think I'm still going to stick with the same answer; that if I try to describe the symptoms of the person, that that might be violating their confidentiality.

MS. GOREN: Okay. How common is it for the NRC to take up an investigation like this? Is this an unusual request to be called in?

MR. GLENN: This kind of activation is relatively rare, not more than once or so a year, on the average. And for this kind of event, I think this is the first time that we've had an incident investigation team for this kind of incident.

MS. GOREN: What is it about this particular event that drew the NRC in?

MR. GLENN: As I mentioned in the beginning, 1) ingestion of radioactive material are extremely rare. This was the second one within a relatively short period of time.

It was felt that we needed to take a broader

look. One thing that's different about an incident investigation team and a normal inspection team, or even a augmented inspection team, is that the incident investigation team is to take a look not only at the incident and the institution at which the incident occurred, but also to take a look at the NRC's regulatory framework and to see whether it's adequate.

MS. GOREN: How would the NRC's regulatory framework be changed in this instance? I mean, what would be a scenario where you might change the way you regulate?

MR. GLENN: Areas that we would look at would be the material accounting and control. Is that adequate, either in terms of individuals being able to have access to material and accidently cause things to happen?

Or in case there are deliberate acts, are our regulations adequate to deter that kind of activity?

MS. GOREN: You may have already mentioned it, but I didn't catch it though. Has the researcher returned to work?

MR. GLENN: My understanding is that he is not working in the laboratory at this point.

MS. GOREN: Does he have -- are there plans for him to return, or is this pending the investigation?

MR. GLENN: I can't -- I really don't know the answer to that question.

MS. GOREN: Do either of you know the answer to that?

MR. MASSE: Not at this time.

MR. LITSTER: No, I don't know his plans.

MS. GOREN: Thank you.

MR. GLENN: Thank you.

MR. GALANEK: Hi, John. Mitch Galanek from the MIT Radiation Protection Office. And I would just like to clarify that you keep mentioning that there were two P-32 ingestions.

So for those not familiar with it, the first one was at NIH that you're referring to, correct?

MR. GLENN: That's correct.

MR. GALANEK: Thank you, just to clear up some confusion.

MR. GLENN: I thought I was making that clear. But yes, the first incident was at NIH. MIT's was the second that had been reported to us. And so there were two of them.

MR. GALANEK: In fact, the NIH one wasn't just a singular person.

MR. GLENN: Yes, and that one involved contamination of a water cooler --

MR. GALANEK: Thank you.

MS. GOREN: -- as well as one individual.

MR. MASSE: Quick question here, John, if I may. Is it true that there was not an IIT type of investigation at NIH, and why? Could you tell us why?

MR. GLENN: I'll tell you what was rather than the why.

MR. MASSE: Okay.1

MR. GLENN: But there was not an IIT at NIH. There was an enhanced effort there. It is what we call an augmented inspection team.

It is an enhanced look at the program, but their charter is more focused on the incident and the institution than the charter of the IIT, which is broader.

MR. MASSE: If the roles were reversed, would you have done an IIT on a second round at NIH, do you think, or --

MR. GLENN: I guess I'd have to say that that's speculation, but that perhaps might be true.

MR. MASSE: Okay.

MR. GLENN: Okay, if there aren't any other questions, thank you very much for your attention and your cooperation.

(Whereupon, the interview was completed at 10:35 a.m.)

C E R T I F I C A T E

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: IIT EXIT INTERVIEW RE: MIT

Docket Number: (NOT ASSIGNED)

Place of Proceeding: BOSTON, MASSACHUSETTS

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Paul Thorn

PAUL THORN
Official Reporter
Neal R. Gross and Co., Inc.