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NUCLEAR REGULATORY COMMISSION

Title: INTERVIEW OF JACQUELYN YANCH

Docket Number: ---

Location: CAMBRIDGE, MASSACHUSETTS

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ADDENDUM

Page	Line	Correction and Reason for Correction
6	20	Change "have" to "haven't"
6	24	insert for "... NRC regulation for reporting
7	19	Change "nuclides" to "nucleotides"
8	19	Change "for" to "of"
9	9	Change "a" to "the"
10	22	Change "isnt" to "is"
10	18	insert "disussions with" between "having" an "a" and remove "maybe strong-arm a bit" from the subsequent line as this colloquialism may be misinterpreted.
11	4	Change "they" to "the Radiation Protection Offic
11	12	Remove "They--"
12	9	Change "stop" to "limit".
13	13	Change "Yeah, I thought of that just afterwards." to "I have given it some thought
15	6	Change "that" to "criminal behaviours"
15	21	Insert "increasing allowed limits"...
16	12	Change "and since" to "for instance"
16	22	Remove this line and "already given them" from the next line.
~~17~~	~~5~~	
17	5	comma between Shielding and times

Page ___ Date 27 Oct Signature J. F. Yanch

UNITED STATES OF AMERICA

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NUCLEAR REGULATORY COMMISSION

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INCIDENT INVESTIGATION TEAM

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INTERVIEW OF JACQUELYN YANCH

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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MONDAY, OCTOBER 23, 1995

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11:30 O'CLOCK A.M.

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INTERVIEWERS:

JOHN GLENN, Team Leader

ALAN L. MADISON

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

(11:33 a.m.)

MR. GLENN: This is October 23rd. The time is approximately 11:33. This is an interview with respect to the Incident Investigation Team at MIT, looking at a P-32 exposure.

My name is John Glenn. I am the leader of the investigation team, and the interview is with Jacquelyn Yanch, who is, I believe, a member of the Radiation Protection Committee.

Just go through a few preliminaries about why we're here and what we're doing. This is a fact-finding investigation. We are not here to fix blame, or we're not doing a compliance inspection. We're not doing a criminal investigation. The IIT is to find out what happened, the probable cause of what happened, and then lessons learned that we can apply both to our own regulatory program and to other licensees who may have situations which are similar.

The object of having the interviews is just to gain information about either the incident itself or, in your case, something about the program here at MIT, so that you can help us in our evaluation of how that maybe did or did not contribute to the incident.

We're transcribing the interview for basically two reasons. One, it allows us to focus on the

information, the asking of questions and listening to the answers, so that we don't get distracted by writing notes. And, two, it creates a formal record of the activities of the investigation team, so that when we write our report we can document the facts on which we base any conclusions that we reach.

The transcript will be available to you to review probably tomorrow, and so if you want to come over here and go through it and see whether we got it right, and then you can -- if you find errors, either misunderstandings of what you said or something where you misspoke yourself, you can fill out what's called an errata sheet, note the line where it occurred, what is there and what it should be, or what additional comments you would like to make about that, so you can correct the transcript in that manner.

When we're through with the team, we will issue a report, and that will be in about 40 or 45 days. At that point, the transcripts upon which that report is based will be placed in a public document room and would be available for members of the public to look at. So if that's a factor you would want to take a look at in terms of whether you want to correct the transcript and make any comments, you should be aware that it will be publicly available.

MR. MADISON: You can also request a copy of

your transcript at that time.

MR. GLENN: Right.

DR. YANCH: Okay. And I only have tomorrow to -- I mean, tomorrow is not going to be possible for me to --

MR. GLENN: If you cannot make tomorrow, we can look at other -- it will first be available tomorrow, and we'll probably be here at least some of Wednesday. And if you can't do it either tomorrow or Wednesday, we can perhaps make special arrangements to --

MR. MADISON: We'll give you a phone number at the close of the interview that you can call and find out.

DR. YANCH: Okay.

MR. GLENN: At this point, I guess I said that I was John Glenn. I'm normally involved in our research at the NRC, which includes the regulation development. I've been transferred from my regular duties to conduct this team.

DR. YANCH: Research --

MR. GLENN: It's the Office of Research. It does not necessarily perform the research, but there are sort of two main activities to the Office of Research. One is rulemaking. The other is to develop the technical basis for our regulatory program, so we might contract with, say, a national lab to look at perhaps a certain technical issue

and find out what the various options are, what the result of a particular exposure might be, to do calculations of tables and this sort of thing. But we don't actually have a laboratory of our own.

DR. YANCH: Okay.

MR. GLENN: And, Alan, if you would introduce yourself.

MR. MADISON: I'm Alan Madison. I'm with the Nuclear Regulatory Commission. I'm a member of the branch that has responsibility for the Incident Investigation Program. I'm also a member of the team.

MR. GLENN: And, Dr. Yanch, if you could state your name, and what you do, and a little bit about your involvement with the Radiation Protection Program here at MIT.

DR. YANCH: Okay. I am Jacquelyn Yanch. I am an Associate Professor of Nuclear Engineering and Whittaker College of Health Sciences and Technology at MIT. My duties at MIT are research, administration, and teaching. My research is in the area of medical applications of radiation and somewhat to do with health aspects of radiation, and I teach radiation biology, radiation biophysics, and radiation health effects, that kind of thing.

MR. GLENN: I think to get us started, what

would be most useful, if you could just, you know, give us kind of a narrative of when you first heard about the incident, what you know about it, and what -- that you're aware of the institution has done up to this point.

DR. YANCH: I first heard of it -- I'm on the Radiation Protection Committee. I have been -- I think this is my fourth year. I heard of the incident in I guess our last quarterly meeting, which I think was in August, I think, at which time Frank Masse brought up the incident and explained the steps that he and his team were taking to determine how much activity this fellow had ingested, and he showed some data -- urine samples and whole body counting data -- to demonstrate -- to look at the -- I guess the biological and physical half-life of the material in the individual.

And he talked about their assessment of total ingested activity, and we discussed NRC regulations for reporting such an incident. And I guess he started the whole thing off by describing a little bit about what happened at the NIH. I have actually read the Science article. I have since been doing more reading on that. But -- and I guess he -- he -- he discussed with the committee their findings, their conclusions vis-a-vis the NRC regulation reporting, and the incident went to a --

MR. GLENN: And did the committee make any

recommendations that you recall?

DR. YANCH: I -- I don't know if you'd call it a recommendation, but we came to the conclusion that the -- I guess the NRC requirement was pretty clear, and the data looked very convincing as to how much would have been ingested, and so we decided that it was not a reportable incident.

And there was a lot of discussion about possible modes of ingestion and just trying to recreate the incident --

MR. GLENN: Right.

DR. YANCH: -- to everybody's satisfaction.

MR. GLENN: Were there any conclusions about probable cause, how the uptake might have occurred?

DR. YANCH: Well, I don't know if there were any conclusions. There was a lot of discussion. Various people on the committee have done that kind of work before. That's why they're on the committee -- you know, working with P-32 to label nuclides and things like that -- and we talked about how easy is it to ingest something like that, and -- but I don't think any conclusions could be reached at that time. I don't know if they have reached any now, but I don't think the committee members could offer any conclusions.

MR. GLENN: I was just kind of interested,

since you were a radiation biologist, did you consult with the Radiation Protection Office in terms of the likely consequences coming into this --

DR. YANCH: Actually, I'm not a radiation biologist. I teach radiation biophysics. In my department, I do more medical applications, and so I don't know that much about internal pathways. I know more about external beam --

MR. GLENN: Oh, okay.

DR. YANCH: -- and neutrons. But it was still very interesting.

MR. GLENN: Could you give us a little bit of -- as a committee member, a little bit of your perspective in terms of what the responsibilities and functions of the committee are and how it works?

DR. YANCH: Well, in terms of -- I guess the first and foremost role is to ensure that MIT protects its employees and students, that it complies with the regulations for different governing bodies -- I think the NRC for radioisotopes, state regulations for radiation-producing machines. But I guess first and foremost it's a body there to protect the staff and students.

MR. GLENN: Is there some process by which people who want to use radiation or radioactive materials need to come to the committee?

DR. YANCH: Yes. You give out paperwork, and you are obliged to be trained periodically, and I think that period depends on what kind of access you want to radiation. There are certain -- certain allowed limits. If you want to exceed those limits, you have to go to the committee, you have to get retrained. Any new person who wants to deal with radiation has to get trained.

And also, the committee is there to -- I don't know if it's actually a committee, but the Radiation Protection Department is there to assist in any further training that needs to go on at any level. We, in the committee, don't actually participate in that training formally.

MR. GLENN: Right.

DR. YANCH: But we would informally. I mean, I do, certainly. Does that answer your question?

MR. GLENN: Yes, I guess the -- my understanding is also that the actual request to use material would be formally voted on --

DR. YANCH: Yes.

MR. GLENN: -- and approved by the Radiation --

DR. YANCH: Yes.

MR. GLENN: -- Protection Committee.

DR. YANCH: And the request to add new isotopes or to exceed your previously approved limit. All of that

goes through a vote.

MR. GLENN: Does the committee play any role if the Radiation Safety Office detects that a principal investigator perhaps -- there are problems in their laboratory, and things are going wrong -- does the Radiation Safety Committee play any role based on those findings?

DR. YANCH: Oh, yes. Yes.

MR. GLENN: Could you explain those a little bit for us?

DR. YANCH: Well, say if an incident came to the committee's attention that somebody was not handling radiation in a safe manner and not complying with the committee's expectations and regulations. Then, I guess people from -- you start with an approach where you -- the committee would discuss it with the principal investigator, who is responsible for that lab, and if things don't get cleared up that way by having a principal investigator maybe strong-armed a little bit to make sure that the staff comply with the regulations, then the committee gets more formal by drafting a letter. That kind of approach.

But the PI isn't responsible for the conduct in his or her lab, and so usually you start there.

MR. GLENN: Okay. How often does the committee send one of these letters to a principal investigator?

DR. YANCH: I think fairly rarely. I don't have any statistics for you.

MR. GLENN: No.

DR. YANCH: I'm sure they would have them. My sense is that people here are trained well, you know, at all levels -- from the top, the bottom, all levels. They are trained in the potential hazards of radiation. And, therefore, they -- if it's brought to someone's attention that somebody in their lab is not handling radiation properly, and it could be a hazard to them or for others that they're working with, I think people come around pretty quickly. They -- so I don't think the committee has had to resort to that extreme level very often. I don't know how often they have though. My sense is that people here are pretty sensible.

MR. GLENN: In terms of the -- you know, this incident that occurred were somehow relatively large -- fraction of the material that was available in the laboratory ended up being in the -- contaminated an individual, what kind of safeguards do you see that the university has to prevent either accidental or deliberate contamination of food or drink that might occur in the laboratory?

DR. YANCH: Well, we have a regulation -- actually, probably I think it's your regulation -- that you

can't -- you know, if you've got radioactivity in a lab, you have food in a separate area. I don't know how you can stop somebody from wilfully and maliciously taking a drop of liquid and squirting it in an orange or something. I don't know how you can stop criminal behavior.

Certainly, keeping food and radiation activity separate would stop a lot of accidental exposures, and, you know, modern ways of pipetting and things like that can stop those accidental exposures. Strict monitoring of, you know, how much is taken from an initial shipment each day and having the paperwork to account for radiation -- for radioactivity that's used would also help that.

But still, there is no -- I don't think there is any way of stopping any deliberate -- now, I don't know if this was a deliberate exposure or not. But if it were --

MR. GLENN: What is your sense of the amount of -- or how good this paper trail is? You mentioned that people would essentially sign out when they were -- as they take the material. Is it your sense that that's a fairly tight process here at the university? Or is it more voluntary?

DR. YANCH: I think there are -- if you have a number of people in a lab accessing the same aliquot or portion of material, I think it's going to be impossible to

get very, very tight about it. So I think what the committee has tried to emphasize is the training of the personnel, and the instruction in safe handling, and the consequences of unsafe handling.

So I think that the two have to go together, because I don't think you can do the first one so well that you can stop any accidental exposures. It has to be coupled with intense training.

MR. GLENN: In terms of what you know about the incident, did you have any personal recommendations as to something that could be done to make it at least more difficult for this kind of thing to happen?

DR. YANCH: Yeah, I thought of that just afterwards. It would depend on if it were -- it would depend if it were a malicious, intentional poisoning, or whatever you want to call it, of somebody or not. And if it weren't -- I actually don't have any recommendations. If it were intentional, then I don't know what you'd do about that. I really don't.

If it weren't intentional and were accidental, then I'd really have to probably go to that person's lab and see exactly how they do their work, and to try and guess how splashes could happen, or something like that. But short of doing that, I don't know the answer.

MR. GLENN: How disruptive would it be to the

way that, you know, an academic research areas works if there were a limited number of people who had, say, custody of a common storage area, or where bulk material is stored, and that this required that a person come to them and then sign out whenever they take activity? Would that be a big disruption to the way research is done?

DR. YANCH: Well, I don't work in that area, and I think from what Frank said at that meeting there were quite a number of people that had access to the same material.

MR. GLENN: I think there is 37 people in the laboratory, so --

DR. YANCH: Yeah. I don't know how disruptive that would be. I don't think everyone has access to it, do they? Do all 37 have access to it?

MR. GLENN: My understanding is that perhaps a large fraction of them do.

DR. YANCH: Oh, okay. I don't know the answer, because I don't work in that area.

MR. GLENN: Alan, do you have any --

MR. MADISON: I have a few questions. Does the committee have any written procedures governing its practices, its processes?

DR. YANCH: Gee, I believe so. If they did, I saw them four years ago.

MR. MADISON: Okay. We should ask --

MR. GLENN: Yes.

DR. YANCH: I don't know if they have any written procedures about -- I mean, this would be very interesting if it were a criminal -- you know, I don't know if they have any procedures about that in particular.

MR. MADISON: Does the committee perform any hands-on audits of the performance of the Radiation Safety Office?

DR. YANCH: Audits of the workings of the safety -- the individuals? I --

MR. MADISON: Yes.

DR. YANCH: Do you mean does our committee oversee the workings of the Radiation Protection Office themselves?

MR. MADISON: Yes.

DR. YANCH: I don't know if we do that in a formal way. We certainly do it constantly in an informal way. During each quarterly meeting, we vote on the applications of different researchers to amend their list of isotopes, increasing allowed, and we talk about how the radiation protection officers have gone through getting the information about what that PI wants to do. And so that's in constant review.

MR. MADISON: Does the Radiation Committee go

out and do an audit or an evaluation of the performance of the surveys or the control measures that the Radiation Protection Office enforces?

DR. YANCH: I don't believe so, but I don't know for sure.

MR. MADISON: Does anybody on the committee audit the training that's provided to authorized users?

DR. YANCH: I don't know if they do that in a formal way. They certainly do it in an informal way, because a lot of the people who are on the committee are on there because they know about radiation. So their groups get trained, and since my group has been trained. So I've done it in an informal way, but I don't know if there is a formal method.

MR. MADISON: Can you describe the training that is given to the authorized users?

DR. YANCH: Well, it depends on what the group of staff and students wants to do with radiation. My group wasn't dealing with open sources or isotopes. We were dealing with accelerator produced radiations, and the training consisted of -- well, I had already given some details from -- I call them the students of mine, so I had already given them details about what radiation was.

So even though he had brought that material, he skipped that at my request. And he talked a lot about the

health effects and the dose levels that were required to produce these health effects, some of the uncertainties involved in knowing what the health effects were as a function of dose, ways to reduce your dose when handling radiation, shielding times and those type of things.

He showed a video on some accidents that had happened. I think that was a good idea, just for him to show us a little bit of fear -- fear of the unknown a little bit.

Let's see. He touched on some of the controversies in radiation and risk assessment, things like that.

MR. MADISON: What kind of time span did the training take?

DR. YANCH: That was about an hour and a half, because it included this video which was maybe 18 or 20 minutes.

MR. MADISON: Okay.

DR. YANCH: He has also been -- he comes down to the lab once in a while, on a periodic basis, and -- because my lab is under development now, so he -- he has also been by, and he has made himself available to students for questions.

MR. MADISON: Do any members of the committee do an audit of -- on a routine basis -- of the laboratory's

practices? For instance, Dr. Tonegawa's lab, would anybody from the committee have been expected to possibly spot check this lab, or any other lab over in the Cancer Center?

DR. YANCH: No. That is done by the radiation protection officers themselves.

MR. MADISON: Does the Radiation Committee have expectations with regard to the accountability or inventory-keeping of radioactive material in the laboratories?

DR. YANCH: Well, we expect that it's excellent. And if it -- but if it's not, then that would bring up a situation such as you were asking about when, obviously, a lab has been lax in that, and that needs to be immediately addressed. And so the committee would get involved in determining how to address that so that it never happens again.

MR. MADISON: Are the expectations in writing?

DR. YANCH: Yes, I believe they -- for such a lab like a biology lab, the -- I believe that they are.

MR. MADISON: Okay.

DR. YANCH: And then this is part of the training and the initial -- when you sign up for -- not sign up but when you fill out the paperwork to request permission to be an authorized user, you get that then. But my lab, for instance, didn't get that. We're not using

those sources.

MR. MADISON: Have there been a number of contaminations within the last year at MIT?

DR. YANCH: I think this is the only one that I am aware of. I don't -- I'm trying to think back to the previous committee meetings. I don't think -- I mean, nothing that -- that has made it to our committee. So, obviously, you know, it's --

MR. MADISON: You don't review all of the minor contaminations at the desk or the --

DR. YANCH: Do you mean in the -- that get wiped up and then --

MR. MADISON: Yes.

DR. YANCH: -- the survey meter says the situation is clear? No, we don't review that. No.

MR. MADISON: Okay. Has there been any actions, or any serious actions, taken with regard to the Tonegawa lab in the last couple of years?

DR. YANCH: No, not that I know of.

MR. MADISON: Okay.

MR. GLENN: Is there anything that we haven't asked you about that you think we should be aware of?

DR. YANCH: Nothing for the record. I just -- it's a very interesting case, just from a detective's point of view. So I don't have anything for the record to add.

I just wondered if there are any police involvement or criminal investigations.

MR. GLENN: There are other investigations going on.

DR. YANCH: Okay. So, no, I have no other questions.

MR. GLENN: Okay. I do have a document here I can give you about the review and availability of the transcripts --

DR. YANCH: Oh, all right.

MR. GLENN: -- which we discussed earlier in the interview. And so this tells you what the rules are. If you need to make arrangements to come over and talk with us, I can give you a number to call to make those arrangements.

DR. YANCH: I mean, do -- I mean, I've been deposed before, and there I went over it with a fine-tooth comb. But do you think -- do most people review their document?

MR. MADISON: Most have.

MR. GLENN: Most have so far, yeah. And I think you will, of course, find that there are errors.

MR. MADISON: We're getting such a fast turnaround they sometimes -- their quality control, meaning the transcriber's quality control, is not as great as it

could be if they were given a couple of days to have other people listen to the tape. They're trying to get us a fast turnaround so that you have an opportunity to review it, so --

DR. YANCH: Oh, okay. Well, maybe I'll --

MR. GLENN: And there are terms that scientists use that sometimes get a little --

DR. YANCH: Right.

MR. GLENN: -- little garbled. But he will at the end ask you questions about any particular words that he has identified.

DR. YANCH: Okay.

MR. GLENN: But there are always chances for mistakes.

DR. YANCH: All right. Maybe I'll look at it, then.

MR. GLENN: The 253-9392 will get you in touch with Cherie Siegel, and she --

DR. YANCH: Cherie Siegel?

MR. GLENN: Yes.

DR. YANCH: Okay.

MR. GLENN: And --

DR. YANCH: After -- tomorrow afternoon, say?

MR. GLENN: Hopefully, by -- yeah, by tomorrow afternoon.

DR. YANCH: Okay.

MR. MADISON: Is there anybody else -- we're about closing on our interview portion of the investigation. We're getting ready to leave the site and go back to headquarters. Is there anybody else you think we should talk to?

DR. YANCH: It sounds like you are interested in the workings of the committee, and you're getting I guess three other people from the committee to talk to. I hope we all have the same thing to say -- I mean, in terms of our views on how the committee works. I think we will. But I can't think of anyone else. I mean, you're getting the head of the committee and three -- two others, I guess.

MR. MADISON: If there's anything else you think of afterwards that you want to tell us, or anybody else that wants to talk to us that you find out about, that number also we can be contacted --

DR. YANCH: Okay.

MR. MADISON: -- for that purpose.

DR. YANCH: Okay. Sure.

MR. GLENN: Okay. Since there are no other questions, we'll bring the interview to a close, and the time is 12:02.

(Whereupon, at 12:02 p.m., the interview was concluded.)

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: INTERVIEW WITH JACQUELYN YANCH

Docket Number: --

Place of Proceeding: Cambridge, 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.

S. Dildine
Official Reporter
Neal R. Gross and Co., Inc.