UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

Title: BRIEFING ON THE GENERIC IMPLICATIONS OF RECENT EVENTS INVOLVING INGESTION OF RADIOACTIVE MATERIAL AT RESEARCH FACILITIES - PUBLIC MEETING

Location: Rockville, Maryland

Date: Tuesday, December 19, 1995

Pages: 1 - 25

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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BRIEFING ON THE GENERIC IMPLICATIONS
OF RECENT EVENTS INVOLVING INGESTION OF
RADIOACTIVE MATERIAL AT RESEARCH FACILITIES

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint Plaza
11555 Rockville Pike
Rockville, Maryland

Tuesday, December 19, 1995

The Commission met in open session, pursuant to notice, at 2:04 p.m., the Honorable SHIRLEY A. JACKSON, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

SHIRLEY A. JACKSON, Chairman of the Commission

KENNETH C. ROGERS, Member of the Commission

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

JOHN C. HOYLE, SECRETARY
KAREN D. CYR, GENERAL COUNSEL
EDWARD JORDAN, DIRECTOR, AEOD
HUGH THOMPSON, DEPUTY DIRECTOR FOR NMSS AND OPERATIONS
SUSAN SHANKMAN, DEPUTY DIRECTOR, DIVISION OF RADIATION SAFETY & SAFEGUARDS, REGION I
CARL PAPERIELLO, DIRECTOR, NMSS
JOHN GLENN, CHIEF, RADIATION PROTECTION & HEALTH EFFECTS BRANCH, RES

P R O C E E D I N G S

[2:04 p.m.]

CHAIRMAN JACKSON: Good afternoon.

Today, the Commission is being briefed by the staff on the generic implications of two recent events, one at NIH and the other at MIT, that involved the ingestion of radioactive material.

After the NIH incident occurred and before the MIT incident, I had written a memo to the staff that indicated my concern with the sufficiency and completeness of our regulatory procedures governing materials licensees in this area. At that time, the staff was requested to identify any needed changes in our regulatory procedures for materials licensees that may have been revealed by the information developed to date by these events.

Commissioner Rogers and I are both aware that the staff has been working diligently to ensure that the NRC's regulatory program is being strengthened in this area to help prevent the occurrence of events of this kind. We have already seen some of the staff's efforts in the form of information notices, proposed rulemakings and other staff activities.

Today, we look forward to hearing more from the staff about the progress that is being made in this very important segment of the NRC's regulatory program. Today's

briefing focuses on the generic implications of recent events involving contamination of individuals with radioactive material at broad scope licensees.

I should mention for the record that I have recused myself from specific matters involving MIT because of my associations with that institution and I do not intend to participate in any particular matters arising out of the IIT or other staff reviews at MIT. I am able, however, to act on generic issues that may affect such broad scope licensees. Generic lessons are the focus of our briefing today.

Commissioner Rogers, would you like to add anything?

COMMISSIONER ROGERS: Nothing right now, thank you.

CHAIRMAN JACKSON: You may proceed, Mr. Thompson.

MR. THOMPSON: Thank you, Chairman Jackson.

As you indicated, the focus of today's briefing is on the generic implications of the ingestion event at two of NRC's regulated facilities. I would like to note the relationship of this briefing on generic implications of material events with this morning's Commission briefing on generic safety issues. Each set of actions from incident investigations is formalized by an EDO action letter. The actions by the assigned officers are tracked and reported in

the ADO annual report until action is completed on those events in the followup actions.

Likewise, the staff in this particular case will be developing an action plan to ensure that the overall findings from these events are properly identified and tracked.

With me this afternoon to discuss these incidents is Dr. Carl Paperiello who is the director of the Nuclear Materials Safety and Safeguard, Mr. Ed Jordon of AEOD, Dr. Susan Shankman who is the deputy division director of Radiation Safety and Safeguard from Region I and Dr. John Glenn, chief of the Radiation Protection and Health Effects Branch in our Office of Research.

In addition to leading the investigation team effort at MIT, Dr. Glenn has coordinated compilation of the lessons learned with Region I, NMSS, and he will conduct today's briefing.

Dr. Glenn.

DR. GLENN: Thank you, Mr. Thompson.

Before discussing the issues that we have identified and the staff actions that we are recommending, I will briefly describe some similar events that we uncovered during our investigation and then I will also very briefly touch upon some of the parameters of the two recent events at NIH and MIT.

If we could have the next slide? The next slide.

[Slide.]

DR. GLENN: Although members of the IIT were aware of some similar events that had occurred, we were surprised at the number that we were able to identify as a part of this investigation. I will take note that some of these events involve more significant activities than we were talking about in these two events.

The event at the University of California at San Francisco in 1978 involved three to four millicuries of P-32, approximately a factor of 10 greater than in these incidents, and it also involved external contamination and possible burns on the skin as well, so that was a very significant event.

We also learned that at Duke University in 1988, there was an incident that involved approximately six millicuries of P-32.

In all of these incidents that are listed here, precursors, deliberate acts were suspected. Only in two of these were they actually confirmed. In Washington University in St. Louis in March of 1983 involved a small quantity of Iodine 125. In that case, the technologist admitted that it had been self-administered.

There was an incident in November of 1992 in Toronto, Canada, that we learned of and in that case it was

a roommate apparently who exposed his own roommate and there was a conviction in that case. So of all the cases we have seen, those are the only two where we have a perpetrator who has been identified.

Another thing I will note is they involved the isotopes phosphorus 32 and iodine 125 in every case. We don't know the clear reason for that but I think there are two likely reasons. One is availability. Those are very commonly used isotopes. Number two, they are isotopes that are likely to be identified relatively easily. Many of our licensees have routine bioassay programs looking for iodine 125 in thyroids and P-32 is extremely easy to detect with a Geiger counter. So both opportunity and detectability may play a role there.

If I could have the next slide, please?

[Slide.]

DR. GLENN: Both of the recent events also involve P-32 and the licensees in both cases reported doses or intakes which were similar to the limit for the year, the annual limit of intake. Take note that at NIH there were 26 other individuals who were found to have had smaller intakes than the primary exposed individual.

Both institutions have licenses from the NRC and since NIH is a federal facility, although it is located in an agreement state, and MIT is in Massachusetts, which is

not yet an agreement state, so both of them were our licensees.

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[Slide.]

DR. GLENN: Briefly, the generic issues that I will be covering today and that were identified by the two teams are whether the NRC's rules and guidance for security and control of radioactive material are adequate, the adequacy of our events databases, the adequacy of our reporting requirements, the adequacy of rules and guidance for management of oversight of radiation protection programs, the adequacy of NRC's guidance and procedures for NRC's response and the adequacy of NRC's guidance and procedures for licensee response. Although license-specific issues were identified by both, I will be only discussing the generic issues and recommended actions.

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[Slide.]

DR. GLENN: There were two conclusions by the team regarding security and control of byproduct material. The first linked security and control to the malicious acts or the misuse of material in that the team concluded that programs for control and security of byproduct material may not be effective to deter or to detect diversion or misuse of radioactive materials. We did not conclude that security

and control can prevent such misuse in all cases, particularly when it is by a knowledgeable individual who is perhaps the person who has the key and the control of the material. However, the team did conclude that effective security and control could deter such misuse and if such misuse is going to be detected, that provides even greater deterrence.

Second, the team concluded that regulatory guidance for security and control of small quantities of unsealed radioactive material is inconsistent. These inconsistencies confuse not only licensees in their implementation of the control programs but NRC inspectors who must judge the adequacy of the programs.

I will discuss the findings that led to this conclusion in the next slide.

[Slide.]

DR. GLENN: First, the regulations and the statement of consideration that accompanied the final Part 20 rule apply stringent security requirements to all quantities of radioactive materials in unrestricted or controlled areas. The regulations are clear, that all licensed materials in unrestricted and controlled areas must either be, one, secured against removal or, two, under constant surveillance. It is a rather clear requirement.

This was backed up in the statements of

consideration that went with the final rule in response to a comment that these requirements and their -- about this requirement and their applicability to tracer quantities used in laboratory research. And the NRC stated in the statements of consideration that the inconvenience caused by complying with these requirements is a small nuisance compared to the consequences of unauthorized access or theft. So we were singing a consistent tune up to that point.

However, in looking through the guidance that we have provided to licensees to implement this rule, we found that we provided guidance on a series of questions and answers about Part 20 and in particular one question, the questioner inquired as to whether these requirements applied to all quantities of radioactive material however small. The answer in our published NUREG is, no.

There was then a further qualification to that question. They asked, in particular, do these restrictions and these requirements apply to quantities of radioactive material that do not require labeling. The answer was a clear, no.

So in this case, the guidance is in conflict with the plain reading of the words and with the statements of consideration. And I think therefore we can't be surprised if some staff and some licensees are confused as to exactly

what the standard is.

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[Slide.]

DR. GLENN: Further, although extensive guidance about controls for ordering byproduct material and for its initial receipt have been provided, neither the regulations nor the guidance address the level of detail to which individual users are accountable for byproduct material. The team found wide variation in the methods used by individual laboratories and project supervisors for dispensing and logging the use of radioactive material within their laboratories.

Again, although there is a statement in draft licensing guidance that institutions should have a strong inventory and accountability system, capable of ensuring that material is accounted for throughout the institution at any time, and that is a quote from the guidance, there is no requirement in the regulations for an inventory of byproduct material which is in use. I emphasize the in use. We do have clear requirements about recording and procedures for receipt, transfer and disposal of material but once it reaches the laboratory and is in use, the regulations do not have any specific requirements concerning inventory.

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[Slide.]

DR. GLENN: Another issue that came to our attention was that since the revision of Part 20, the controlled area has been a part of the radiation protection framework. The security systems and site layout make this a very useful concept for part 50 facilities but the appropriate use of controlled areas at materials facilities which are more accessible to members of the public has been an issue.

At one of the institutions, the licensee designated many areas where radioactive materials are used as controlled areas rather than restricted areas and, again, the regulations do not prohibit this interpretation of use areas being controlled areas.

Although OGC has recently provided advice to the staff regarding guidance for controlled areas, there still remains confusion as to how materials licensees can effectively implement this guidance. Licensing guidance for establishing restricted, controlled and unrestricted areas has not been developed in detail for licensed activities such as research at academic institutions.

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[Slide.]

DR. GLENN: In the area of security and control of radioactive materials, we are recommending staff actions that would include evaluate the security and control

regulations and guidance in this area both for consistency and practicality, determine the need to develop requirements for inventory and accounting of material in use, evaluate the current regulations and guidance with regard to restricted, unrestricted and controlled areas and, finally, to develop and implement new or revised regulations and guidance as appropriate.

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[Slide.]

DR. GLENN: The team concluded that NRC's failure to disseminate information to the licensees about known precursor events may have been a contributing cause to later events. The team conclusion relates to the failure by the NRC to identify deliberate misuse, to expose individuals as an issue and also the lack of communication to licensees about those events that we were aware of.

The first information notice specifically addressing this issue was issued in October of this year following the NIH incident. In its review of NRC's collection and analysis of event data, the team found, one, that there was no single database that contained all instances of interest. I will mention, I guess, that we have been gathering information from the agreement states since we have completed and there have been more incidents that have come to our attention as a result of that.

Second, there were no international events in the database. We happened to find out about the one in Canada through contacts at an agreement states meeting.

Three, we take note that there have been recent improvements by the creation of the Nuclear Materials Events Database in 1992, so there is now a much more formal system for collecting and recording this kind of information.

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[Slide.]

DR. GLENN: The recommended actions are to review the current mechanisms for collection, review and dissemination of nuclear materials events, to review the agreement state voluntary participation in data collection as well as the compatibility of agreement state requirements, evaluate the need to collect and include similar international events in NRC's review process and, finally, to develop mechanisms and modify or revise procedures as appropriate.

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[Slide.]

DR. GLENN: In one of these events, the licensee concluded that the event was not reportable and the team reviewed NRC reporting requirements and concluded that NRC reporting requirements are unclear for intake of license materials and are not specific regarding intentional

contamination.

In particular, the team found that there was licensee and staff confusion regarding the meaning of "to receive in a period of 24 hours a total effective dose equivalent of five rems." The fuller quote of that reporting requirement is that each licensee shall within 24 hours of discovery of any event involving loss of control of licensed material possessed by the licensee that may have caused or threatens to cause an individual to receive in a period of 24 hours a total effective dose equivalent or exceeding five rem.

We have found essentially that there were two camps of interpretation of that reporting requirement. The first camp is that, although that may not be what we meant it to say, that the clear meaning of the words is a tissue dose where the energy deposited per unit mass in fact is five rems in a 24-hour period.

The other clear camp was that the definition of committed effective dose equivalent is for an intake or an internal dose and the committed dose is, in fact, the 50-year dose that results from the intake. Therefore, we should interpret this in that fashion to be as soon as the intake takes place, the committed dose has been received and therefore automatically it is within 24 hours.

Take one note that had these events involved

spreadable contamination on the external skin of individuals, that Part 30 has a relatively clear reporting requirement that anyone who has spreadable contamination who is taken to a medical facility, that that is a reportable event. However, in these cases, there was not spreadable activity; it was internal.

Finally, as was discussed earlier, there is current rulemaking underway to revise the regulations to require reports for deliberate misuse of material, regardless of the resulting internal or external doses.

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DR. GLENN: The recommended action is to evaluate the current regulations and guidance regarding reporting of internal contamination and to revise or clarify as appropriate.

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[Slide.]

DR. GLENN: The team found and concluded that some licensees do not use a process of management review and self-assessment to find weaknesses and take remedial action. Certainly, this is something that we expect our power plant licensees to have a very active program for. With our broad scope licensees, I think it is not so common.

In particular, members of one radiation safety

committee that were interviewed saw their role more in the perspective review of uses and procedures. The need for an independent review of a program that had already been implemented by a technically competent radiation safety staff was not considered necessary.

In its review of the regulations, the team found that Part 33 does not provide any detailed descriptions of the duties of the radiation safety officer or of the radiation safety committee. It does address the same things that the radiation safety committee people that we interviewed were talking about and that is the prospective approval of new projects.

In particular, Part 33 does not address oversight, including audits, by either the radiation safety committee or the management.

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[Slide.]

DR. GLENN: The team also found that a draft licensing guide issued in October 1994 does in fact include description of responsibilities of licensing management, the radiation safety officer and the radiation safety committee. However, implementation and inclusion in the -- as requirements of the license would not occur until the next license renewal.

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[Slide.]

DR. GLENN: The recommended actions are that the staff evaluate the regulations and guidance for management oversight of broad scope license programs, develop new or revised regulations and guidance as needed. And, more particularly, evaluate the need to finalize the draft guidance for broad scope licensees or incorporate its requirements in Part 33 and/or in Part 30 as appropriate.

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[Slide.]

DR. GLENN: One of the primary conclusions reached by the incident investigation team was that recent past ingestion events may have resulted from deliberate acts. Therefore, the team reviewed the NRC's directives and guidance regarding response to see whether they did address deliberate acts resulting in exposure of individuals.

The team found that management directive 8.3 does not, in fact, specify a deliberate exposure event as a significant operational event requiring either an incident investigation team or an augmented inspection team.

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[Slide.]

DR. GLENN: Further, from discussions about the two events, the teams found that of the two events, the event at the National Institutes of Health involved more

individuals, 27, and was more unusual in that it involved a pregnant woman than the event at the Massachusetts Institute of Technology which was an IIT. We also noted that IITs receive more of the agency's resources and have available to them more extensive guidance than the AITs. I guess what I am saying, in 20/20 hindsight, one can look back and say, perhaps, that the NIH should have been an IIT as well as MIT or instead of MIT.

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[Slide.]

DR. GLENN: The recommended actions are that we, after these two events, evaluate the adequacy of the procedures and the guidance for an AIT including when the members should recommend an AIT should be upgraded to an incident investigation team. Also evaluate the adequacy of guidance for chartering IITs and AITs for events involving possible deliberate acts. And, finally, issue revised procedures and guidance as appropriate.

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[Slide.]

DR. GLENN: One similarity that we noticed in comparing notes between the AIT and the IIT was that in both recent events licensees lost information about early excretion of phosphorus 32 because clear instructions were not provided to the exposed individual about sample

collection. In reviewing our own internal guidance for its effectiveness, we found that NRC guidance is extensive for the analysis of data but not the collection of data. I think we were quite pleased with how well we could follow our own guidance in terms of doing the dosimetry and come up with consistent answers but with respect to the simpler areas, the administrative procedures for collection, these events have demonstrated that such simple things sometimes require advanced planning and careful explanation.

Such a simple thing as what do you mean by a 24-hour urine specimen. In terms of telling the person how to collect it, they should consider and maybe we should have model procedures telling how that should be done.

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[Slide.]

DR. GLENN: In particular, we found that they didn't have preplanned procedures for sample collection, sample documentation or duration of sample collection and that became an issue in one of these cases as well.

The actions that we are proposing would be to evaluate the current regulatory guidance for adequacy of collection as well as the analysis of intakes and to issue new or revised guidance or procedures as appropriate and that completes my prepared report.

MR. THOMPSON: That concludes our overall

presentation of the generic implications and we would be pleased to respond to any questions that you have.

CHAIRMAN JACKSON: Commissioner Rogers?

COMMISSIONER ROGERS: Well, just what do you see the role of the radiation safety officer with respect to this last -- your actions. Issue new or revised guidance and procedures as appropriate. Would they address the radiation safety officer in any way in those?

DR. GLENN: I think one of the earlier action items that I discussed would probably get a little more at that and that is to go into Part 33 and make sure that Part 33 addresses the responsibilities of management, the radiation safety committee and the radiation safety officer in more detail.

COMMISSIONER ROGERS: It did seem to me not in necessarily either one of these exactly but that the role of the radiation safety officer is sometimes a very difficult one in some of these institutions where you have a collection of very active prestigious researchers running around and a radiation safety officer who is regarded not as highly professionally as they are, at least by them, and they don't really like to be paying too much attention to the radiation safety officer and yet a lot of these things probably need a very active radiation safety officer to make sure they get carried out properly. People have to

cooperate with the RSO.

I don't know if anybody wants to make a comment about that in these past events but I suspect that particularly the more professional the organization the more difficulty the radiation safety officer's life is apt to be.

MR. THOMPSON: Certainly I think we have found that to be true and some of the comments that were made in our interviews indicated that the radiation safety committee saw its role in some sense to back up the radiation safety officer under the circumstances where a rather prestigious researcher -- there might need to be some disciplinary action taken and that the radiation safety committee is there to back up the radiation safety officer in those circumstances.

COMMISSIONER ROGERS: It is just, you know, the guidance and procedures, if they just stated it in a very abstract way that doesn't directly involve the RSO, may leave something a little bit hanging that perhaps should be wrapped up a little more closely in the RSO's responsibilities.

MR. THOMPSON: I think we will look at that very closely. Obviously the bigger the scope of the activities and the number of people involved, it is -- there are many interpersonal issues that get involved, as you say, with people who are really dedicated researchers who have

programs going kind of night and day and you know it is important there be a proper balance between the radiation safety officer's authority and ability to carry out those inspection activities, not necessarily just during the normal work days but their research activities, you know, go almost around the clock on some of these activities so it is quite an important area and we certainly intend to look at that carefully.

COMMISSIONER ROGERS: Well, this data collection question, you know, seems to be that that is where the radiation safety officer has to be able to move in and make sure those data are taken promptly. That was one of the problems in one of these cases that it was many hours later before some data was taken that, if taken earlier, might have made a difference in some way.

So it is just an issue that I think is -- I think they are connected. I think the authority of the radiation safety officer and the carrying out of this very prompt collection of data are linked together in an important way.

How do you expect to collect data on international events of this sort? We have had trouble keeping track of these things here in our own country. How can we collect this kind of information on an international scale?

MR. JORDAN: We would plan to contact IAEA and see if there is a counterpart that we could work with, much as

we do with reactors to collect experience. Of course, the complication is in many countries they have totally different regulatory schemes for materials than reactors so there may be only a small increase in population of events that we might get access to through that way.

The other would be some sort of bilateral exchanges with some of our associates.

COMMISSIONER ROGERS: Is there any way we can speed up this implementation of the revised guidance? That isn't supposed to take place until the next license renewal.

DR. PAPERIELLO: I believe that what we should do is revise Part 33. I don't like changing the guidance and then having to upgrade everybody. That would subject roughly 200 licensees to license renewal procedures and not assure -- I will not have any assurance I will get uniformity. If I want uniformity among these licensees we would be far better off, in my view, that we change Part 33 and write an RSO requirement and a radiation safety committee requirement that has teeth.

COMMISSIONER ROGERS: I'd like to see that. I think that is very important.

That's all that I have.

CHAIRMAN JACKSON: Well, I think Commissioner Rogers has pretty much covered the waterfront.

I would like to thank the staff for today's

excellent briefing on the generic implications of events involving ingestion of radioactive material.

As I had mentioned earlier, the Commission is concerned, obviously, about any potential deficiencies in our regulations that may have contributed to the occurrence of the events discussed and, of course, the Commission is always interested in methods that could improve our regulatory base as just discussed.

From what I have heard today, it certainly sounds as if the staff is well on its way to identifying or having identified the issues as well as the types of actions and regulatory changes that may be needed to assure a more consistent and cohesive regulatory framework.

So the Commission encourages the staff to continue to evaluate the events of the type that you have discussed in the generic sense and to continue to make recommendations to the Commission for improving our program.

Again, thank you.

We stand adjourned.

[Whereupon, at 2:40 p.m., the meeting was concluded.]

CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON THE GENERIC IMPLICATIONS OF RECENT EVENTS INVOLVING INGESTION OF RADIOACTIVE MATERIAL AT RESEARCH FACILITIES - PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Tuesday, December 19, 1995

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Christopher Cutchall

Reporter: Mark Mahoney

GENERIC IMPLICATIONS OF RECENT EVENTS INVOLVING INGESTION OF RADIOACTIVE MATERIAL AT RESEARCH FACILITIES

DECEMBER 19, 1995
JOHN E. GLENN

AGENDA

- PRECURSORS
- RECENT EVENTS
- ISSUES/ACTIONS

PRECURSORS					
DATE	LOCATION	ISOTOPE	REPORTED DOSE/INTAKE	NO. OF PEOPLE CONTAMINATED	AGREEMENT STATE
11/78	UNIVERSITY OF CALIFORNIA	P-32	3-4 mCi	3	Y
2/82	BROWN UNIVERSITY	P-32	157 μCi	2	Y
3/83	WASHINGTON UNIVERSITY	I-125	0.360 μCi	1	N
8/84	VA MEDICAL CENTER (BRONX)	I-125	524 μCi	1	N
3/88	ALBERT EINSTEIN MEDICAL CENTER (NEW YORK)	P-32	400-800 μCi	1	Y
4/88	DUKE UNIVERSITY	P-32	5.96 mCi	1	Y
6/91	UNIVERSITY OF CALIFORNIA	I-125	78 μCi	1	Y
11/92	TORONTO, CANADA	P-32	1.9 rem	1	N/A

RECENT EVENTS				
DATE	LOCATION	ISOTOPE	REPORTED DOSE/INTAKE	NO. OF PEOPLE CONTAMINATED
6/95	NIH BETHESDA, MD	P-32	500 μCi	27
8/95	MIT CAMBRIDGE, MA	P-32	579 μCi	1

ISSUES

- SECURITY AND CONTROL OF RADIOACTIVE MATERIALS
- ADEQUACY OF NRC'S EVENTS DATABASE
- ADEQUACY OF REPORTING REQUIREMENTS
- MANAGEMENT OVERSIGHT OF RADIATION PROTECTION PROGRAMS
- ADEQUACY OF NRC'S GUIDANCE AND PROCEDURES FOR NRC RESPONSE
- ADEQUACY OF NRC'S GUIDANCE AND PROCEDURES FOR LICENSEE RESPONSE

SECURITY AND CONTROL OF RADIOACTIVE MATERIALS

CONCLUSIONS:

- PROGRAMS FOR CONTROL AND SECURITY OF BYPRODUCT MATERIALS MAY NOT BE EFFECTIVE TO DETER OR DETECT DIVERSION OF MATERIALS

- REGULATORY GUIDANCE FOR SECURITY AND CONTROL OF SMALL QUANTITIES OF UNSEALED RADIOACTIVE MATERIAL IS INCONSISTENT

SECURITY AND CONTROL OF RADIOACTIVE MATERIALS (continued)

FINDINGS:

- REGULATIONS AND STATEMENT OF CONSIDERATION APPLY STRINGENT SECURITY REQUIREMENTS TO ALL QUANTITIES OF RADIOACTIVE MATERIALS IN UNRESTRICTED OR CONTROLLED AREAS

- GUIDANCE DOCUMENTS STATE STRINGENT SECURITY REQUIREMENTS DO NOT APPLY TO SMALL QUANTITIES OF RADIOACTIVE MATERIALS

SECURITY AND CONTROL OF RADIOACTIVE MATERIALS (continued)

FINDINGS: (continued)

- NEITHER THE REGULATIONS NOR GUIDANCE ADDRESS THE LEVEL OF DETAIL TO WHICH INDIVIDUAL USERS ARE ACCOUNTABLE FOR BYPRODUCT MATERIAL

- THERE IS NO REQUIREMENT IN THE REGULATIONS FOR INVENTORY OF BYPRODUCT MATERIAL IN USE (RECEIPT, TRANSFER, AND DISPOSAL ARE ADDRESSED)

SECURITY AND CONTROL OF RADIOACTIVE MATERIALS (continued)

FINDINGS: (continued)

- ALTHOUGH OGC HAS RECENTLY PROVIDED ADVICE TO THE STAFF REGARDING GUIDANCE FOR CONTROLLED AREAS, THERE STILL REMAINS CONFUSION AS TO HOW MATERIALS LICENSEES CAN IMPLEMENT THIS GUIDANCE. LICENSING GUIDANCE FOR ESTABLISHING RESTRICTED, CONTROLLED, AND UNRESTRICTED AREAS HAS NOT BEEN DEVELOPED FOR LICENSED ACTIVITIES SUCH AS RESEARCH AT ACADEMIC INSTITUTIONS

SECURITY AND CONTROL OF RADIOACTIVE MATERIALS (continued)

ACTIONS:

- EVALUATE SECURITY AND CONTROL REGULATIONS AND GUIDANCE
- DETERMINE NEED TO DEVELOP REQUIREMENTS FOR INVENTORY AND ACCOUNTING OF MATERIAL IN USE
- EVALUATE CURRENT REGULATIONS AND GUIDANCE WITH REGARD TO RESTRICTED, UNRESTRICTED, AND CONTROLLED AREAS
- DEVELOP AND IMPLEMENT NEW OR REVISED REGULATIONS AND GUIDANCE, AS APPROPRIATE

ADEQUACY OF NRC'S EVENT DATABASES

CONCLUSION:

- NRC'S FAILURE TO DISSEMINATE INFORMATION TO LICENSEES ABOUT KNOWN PRECURSOR EVENTS MAY HAVE BEEN A CONTRIBUTING CAUSE TO LATER EVENTS

FINDINGS:

- NO SINGLE DATABASE CONTAINED ALL INSTANCES OF INTEREST
- NO INTERNATIONAL EVENTS IN THE DATABASES
- RECENT IMPROVEMENTS BY CREATION OF NUCLEAR MATERIALS EVENTS DATABASE IN 1992

ADEQUACY OF NRC'S EVENT DATABASES
(continued)

ACTIONS:

- REVIEW CURRENT MECHANISMS FOR COLLECTION, REVIEW, AND DISSEMINATION OF NUCLEAR MATERIALS EVENTS
- REVIEW AGREEMENT STATE VOLUNTARY PARTICIPATION IN DATA COLLECTION AS WELL AS COMPATIBILITY OF REPORTING REQUIREMENTS
- EVALUATE THE NEED TO INCLUDE SIMILAR INTERNATIONAL EVENTS IN NRC'S REVIEW PROCESS
- DEVELOP MECHANISMS AND MODIFY OR REVISE PROCEDURES, AS APPROPRIATE

ADEQUACY OF REPORTING REQUIREMENTS

CONCLUSION:

- NRC REPORTING REQUIREMENTS ARE UNCLEAR FOR INTAKE AND ARE NOT SPECIFIC REGARDING INTENTIONAL CONTAMINATION

FINDINGS:

- LICENSEE AND STAFF CONFUSION REGARDING MEANING OF "TO RECEIVE IN A PERIOD OF 24 HOURS, A TOTAL EFFECTIVE DOSE EQUIVALENT OF 5 REMS"

- CURRENT RULEMAKING IS UNDERWAY TO REVISE REGULATION TO REQUIRE REPORTS FOR DELIBERATE MISUSE OF MATERIAL, REGARDLESS OF RESULTING INTERNAL OR EXTERNAL DOSES

ADEQUACY OF NRC REPORTING REQUIREMENTS (continued)

ACTION:

- EVALUATE CURRENT REGULATIONS AND GUIDANCE REGARDING REPORTING OF INTERNAL CONTAMINATION AND REVISE OR CLARIFY, AS APPROPRIATE

WEAK MANAGEMENT OVERSIGHT

CONCLUSION:

- SOME LICENSEES DO NOT USE A PROCESS OF MANAGEMENT REVIEW AND SELF ASSESSMENT TO FIND WEAKNESSES AND TAKE REMEDIAL ACTION

FINDINGS:

- PART 33 DOES NOT PROVIDE A DETAILED DESCRIPTION OF THE DUTIES OF THE RADIATION SAFETY OFFICER OR THE RADIATION SAFETY COMMITTEE

WEAK MANAGEMENT OVERSIGHT
(continued)

FINDINGS: (continued)

- **DRAFT GUIDANCE ISSUED OCTOBER 1994 DOES INCLUDE DESCRIPTIONS OF RESPONSIBILITIES OF LICENSEE MANAGEMENT, THE RADIATION SAFETY OFFICER, AND THE RADIATION SAFETY COMMITTEE**

- **IMPLEMENTATION OF THE REVISED GUIDANCE WILL NOT OCCUR UNTIL THE NEXT LICENSE RENEWAL**

WEAK MANAGEMENT OVERSIGHT
(continued)

ACTIONS:

- EVALUATE REGULATIONS AND GUIDANCE FOR MANAGEMENT OVERSIGHT OF BROAD SCOPE LICENSED PROGRAMS. DEVELOP NEW OR REVISED REGULATIONS AND GUIDANCE AS NEEDED

- EVALUATE THE NEED TO FINALIZE DRAFT GUIDANCE FOR BROAD SCOPE LICENSES OR INCORPORATE AS REQUIREMENTS IN PARTS 33 AND/OR 30, AS APPROPRIATE

ADEQUACY OF NRC'S GUIDANCE AND PROCEDURES FOR NRC RESPONSE

CONCLUSION:

- RECENT AND PAST INGESTION EVENTS MAY HAVE RESULTED FROM DELIBERATE ACTS

FINDINGS:

- MANAGEMENT DIRECTIVE 8.3 DOES NOT SPECIFY A DELIBERATE EXPOSURE EVENT AS A SIGNIFICANT OPERATIONAL EVENT REQUIRING EITHER AN INCIDENT INVESTIGATION TEAM (IIT) OR AN AUGMENTED INSPECTION TEAM (AIT)

ADEQUACY OF NRC'S GUIDANCE AND PROCEDURES FOR NRC RESPONSE (continued)

FINDINGS: (continued)

- THE EVENT (AIT) AT THE NATIONAL INSTITUTES OF HEALTH INVOLVED MORE INDIVIDUALS (27) AND WAS MORE UNUSUAL (INVOLVED A PREGNANT WOMAN) THAN THE EVENT (IIT) AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

- IITs HAVE MORE RESOURCES AND MORE EXTENSIVE GUIDANCE THAN AITs

ADEQUACY OF NRC'S GUIDANCE AND PROCEDURES FOR NRC RESPONSE (continued)

ACTIONS:

- EVALUATE THE ADEQUACY OF PROCEDURES AND GUIDANCE FOR AN AIT INCLUDING WHEN TO RECOMMEND THAT AN AIT BE UPGRADED TO AN IIT
- EVALUATE THE ADEQUACY OF GUIDANCE FOR CHARTERING IITs AND AITs FOR EVENTS INVOLVING POSSIBLE DELIBERATE ACTS
- ISSUE REVISED PROCEDURES AND GUIDANCE, AS APPROPRIATE

ADEQUACY OF NRC'S GUIDANCE AND PROCEDURES FOR LICENSEE RESPONSE TO INTAKES OF RADIOACTIVE MATERIALS

CONCLUSION:

- LICENSEES LOST INFORMATION ABOUT EARLY EXCRETION OF PHOSPHORUS-32 BECAUSE CLEAR INSTRUCTIONS WERE NOT PROVIDED TO THE EXPOSED INDIVIDUAL FOR SAMPLE COLLECTION

FINDINGS:

- NRC GUIDANCE IS EXTENSIVE FOR ANALYSIS OF DATA BUT NOT COLLECTION OF DATA

ADEQUACY OF NRC'S GUIDANCE AND PROCEDURES FOR LICENSEE RESPONSE TO INTAKES OF RADIOACTIVE MATERIALS (continued)

FINDINGS: (continued)

- LICENSEES IN RECENT EVENTS DID NOT HAVE PREPLANNED PROCEDURES FOR SAMPLE COLLECTION, SAMPLE DOCUMENTATION, OR DURATION OF SAMPLE COLLECTION

ACTIONS:

- EVALUATE THE ADEQUACY OF REGULATORY GUIDANCE FOR COLLECTION OF DATA TO ANALYZE INTAKES

- ISSUE NEW OR REVISED GUIDANCE AND PROCEDURES, AS APPROPRIATE

BREAKDOWN OF ALL 820 GENERIC ISSUES
(AS OF 12/95)

• **Safety**	
Resolved	350
Integrated (into other issues)	128
High-priority	4
Medium-priority	6
Low-priority	33
Dropped	101
Nearly-resolved	5
To be prioritized	3
	630
• **Non-safety**	
LI	158
RI	17
EI	15
	190
• **Total of all GIs**	820

TASK ACTION PLANS

1. Boiling water reactor internals cracking
2. Reactor pressure vessel action plan
3. Motor-operated valves action plan
4. SRP revision action plan
5. Nuclear power plant shift staffing
6. Notice of enforcement discretion - improvement action plan
7. New source term for operating reactors
8. Endangered species action plan
9. Effect of hurricane Andrew on Turkey Point
10. General Electric extended power uprate action plan
11. Dry cask storage action plan
12. BWR suction strainer clogging issue
13. Accident management implementation
14. Fire protection task action plan
15. PRA implementation action plan

TASK ACTION PLANS (CONTINUED)

16. Environmental qualification task action plan
17. Generic spent fuel storage pool
    Part A: operating facilities
    Part B: permanently shutdown facilities
18. Core performance action plan
19. High burnup fuel action plan
20. RRG topic area 55: cycle specific parameter limits in tech specs
21. Thermo-lag action plan