UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Title: BRIEFING ON NATURALLY-OCCURRING AND ACCELERATOR-PRODUCED RADIOACTIVE MATERIALS

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NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING

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Nuclear Regulatory Commission

One White Flint North

Rockville, Maryland

THURSDAY, MAY 5, 1988

The Commission met in open session, pursuant to notice, at 10:00 a.m., the Honorable LANDO W. ZECH, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

LANDO W. ZECH, Chairman of the Commission

FREDERICK M. BERNTHAL, Member of the Commission

KENNETH CARR, Member of the Commission

KENNETH ROGERS, Member of the Commission

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

S. CHILK

V. STELLO

G. AUSTIN

C. KAMMERER

C. HARDIN

W. PARKER

B. BERNERO

A. YOUNG

T. STRONG

W. DORNSIFE

P R O C E E D I N G S

CHAIRMAN ZECH: Good morning, ladies and gentlemen. The purpose of today's meeting is for the NRC staff to brief the Commission on their review of naturally-occurring and accelerator-produced radioactive materials, NARM, and the basis for their recommendations in NRC's paper SECY 88-64.

This review was initiated in part, as a result of the Conference of Radiation Control Program Directors' request that the NRC seek legislative authority to regulate NARM. The Commission will also hear from Alvin Young, Chairman of the Committee on Interagency Radiation Research, and Terry Strong, Charles Hardin, and William Dornsife of the Conference of Radiation Control Program Directors. We appreciate very much your participation with us today.

This is an information briefing this morning. I believe the meeting will be of assistance to the Commission in our understanding the NARM issues better, as well as in making any decisions that may be forthcoming. I understand that copies of the slides are available at the entrance to the meeting room.

Do any of my fellow Commissioners have any opening comments before we begin?

COMMISSIONER BERNTHAL: Yes, I'd like to make a comment or two.

CHAIRMAN ZECH: Excuse me for interrupting. Let me

just say, Commissioner Roberts will not be with us this morning. Mr. Bernthal, please.

COMMISSIONER BERNTHAL: I don't often make comments, but I do want to make a comment on this one before we begin. I think this a terribly important area, one that has represented a gap in regulatory oversight for years. Nobody has picked up on that gap. If you go through the rather sad history of this whole issue -- my staff summarized it for me, and I'm sure the rest of my colleagues have similar summaries.

The history began in 1946, and I won't go through it all in detail, but there have been fits and starts and attempts over the years, to bring this area under some sort of unified oversight, whether federal, state -- in principal, I suppose it could be anything, but whatever it could be, it never has happened.

I'd like to congratulate our staff, first of all, on what I think was an absolutely first-rate job, an excellent paper, a very well written history and review of the status of this issue. I think that that will provide the basis for the Commission, perhaps after I'm gone, but I would hope to reach a substantive conclusion, and finally become the focal point for some action in this area.

I just want to read one quotation here, because I think it's terribly important and sets the stage for what I would hope is going to be some careful Commission attention in

the months ahead, and that is the letter that the Commission received last summer from the Conference of Radiation Control Program Directors. And in that letter, the Conference restated the problem. And I'm quoting from the letter now, "The issue, simply stated, is that NARM radioactive material is not adequately or uniformly regulated in the United States, and as a result, has the potential for significant exposure to the public and for contamination of the environment.'' unquote.

So, Mr. Chairman, it seems to me that's why we're here this morning. And I certainly look forward to hearing what educational material we can on this issue, and then to seeing what this agency finally, after having committed and thought it would do so in the past, finally now might go ahead and do about this issue. That's all I wanted to say.

CHAIRMAN ZECH: Thank you very much. Any other comments? If not, Mr. Stello, would you proceed, please?

MR. STELLO: Thank you, Mr. Chairman. Yes, I'll turn to General Austin in a moment, and you'll notice we all are sitting at the table because I think, Mr. Young and others who came with us today, are going to have a great deal to offer, to help the Commission decide what it ought to do on this matter.

What is before the Commission is very simple, and that's an area where we are not now authorized and otherwise directed by law, to regulate in the area of NARM. The question, I think, that's clearly before the Commission is,

what ought the Commission do about it? And as you will see in a moment when we get to what we recommend doing -- we recommend the Commission do, is to have this matter referred to Mr. Young and his Committee, for them to sort it out.

Because it is, indeed, very, very complicated, and it has enormous implications for our agency and for our precious few resources, if we do undertake the activity. It's an issue we must go through very carefully in sorting out where we come out, because not only when we need legislation, we will need to augment substantially, the resources that we have available to do the job.

With that, let me ask John to begin, and then we will just continue going directly up to John next, and open it up for any questions the Commission might have.

CHAIRMAN ZECH: I thank you very much. Proceed.

MR. AUSTIN: Mr. Chairman, Commissioners. The issue of NARM regulation is very old and very complex. This presentation is primarily to refresh your memories of what is in the reports, and the presentation itself should not be taken as a substitute all of the material that is in the report.

NARM is the collective term for naturally-occurring and accelerator-produced radioactive materials. The NARM universe is immense. NARM is found in the environment, in homes, in the workplace, in consumer products, and in medical institutions. Radium-226, Radon-222, and Polonium-210 are

significant sources of exposures of the public.

Radium is found in tailings of the mineral extraction industries, and some of the tailings can contain radium in concentrations in excess of our remedial action levels for uranium mill tailings. Radium can be concentrated in the resins in water purification plants to very high levels. That's the naturally occurring side of NARM.

On the other side, there are thousands of cyclotrons and accelerators in use, for example, in medical institutions and in the semi-conductor industries. Carbon-11, Oxygen-15, Indium-11, Iodine-123, are examples of radionuclides that are produced solely through cyclotrons.

With regard to problems with NARM, in October 1987, the Conference of Radiation Control Program Directors requested all of the states to describe their problems with NARM over the past 5 years. About 20 states responded. From my review of those responses, I saw no clear trend of actual harm to the public from discrete sources of NARM. They reported a few contamination incidents. One commentor said that radium turns up out of nowhere -- in bank vaults, in attics, and in laboratory drawers.

It's important to recognize that NARM exposures are a subset of ionizing radiation exposures. So, if I could have the second vu-graph.

[Slide.]

The second vu-graph is as pie chart of the sources of radiation exposures to the public. This indicates that on average, natural sources of radiation contribute about 82 percent of the total dose per year. Man-made sources account for the other 18 percent.

I'd like to call your attention to the upper part of the pie. On the internal sources of radiation exposure, they account for 11 percent of the total. That comes from Potassium-40, Lead-210, Polonium-210, primarily from the ingestion of leafy vegetables; radium nuclides are concentrated in some foodstuffs. For example, brazil nuts can have radium concentrations equivalent to that of our standard for remedial action, and uranium mill tailings.

So it is these naturally radionuclides which contribute a significant source.

COMMISSIONER BERNTHAL: So eating a brazil nut is worse than eating one of those irradiated gemstones that we've been worried about.

MR. AUSTIN: Yes, sir.

COMMISSIONER BERNTHAL: That's very interesting.

MR. AUSTIN: We all have heard recently about radon in basements. The National Council on Radiation Protection and Measurements estimates that radon contributes about 55 percent of the annual dose to the public. That 55 percent is 200 rems.

COMMISSIONER BERNTHAL: Sorry to interrupt again. I

can't resist pointing out for the record here, that that 55 percent was a quantity that nobody knew about just a very few years ago. Nobody worried about it till very recently. I know we knew about radon, but we didn't worry about it till very recently.

The nuclear fuel cycle here, I believe says, one tenth of one percent. So, 55 percent is an area that we simply were unaware of, and didn't concern ourselves with until a very few years ago. The record should show that.

MR. STELLO: Commissioner Bernthal, I guess I ought to explain, Mr. Dornsife and I are both here, reminiscent of the time of TMI when we had whole-body counts up there, and created a problem for the state of Pennsylvania because of radon. We did whole-body counts and found no one had anything in their bodies from the accident at TMI, but had to explain -- I think it was about 30 people -- and the state of Pennsylvania had an enormous task on their hands -- how come all these people had radioactivity in their bodies from the radon in their homes?

COMMISSIONER BERNTHAL: You could have been 10 years ahead of your time.

MR. AUSTIN: It was the first feel of the radon problem we eventually found.

MR. STELLO: It was very significant at the time, trying to explain it in the environment of TMI.

COMMISSIONER BERNTHAL: The fact is, that did not come into the public attention, and the fact that we're all testing in basements now, only began to happen really within the last year or so. That's my point. But, go ahead, John, sorry to interrupt.

MR. AUSTIN: It is a very interesting topic, because this country is spending over a $1 billion to stabilize uranium mill tailings on the basis of calculations of statistical deaths. And then when one looks at this source, radon, in the homes, which may be causing 5-25,000 deaths per year, the question does come up, should the Federal Government as a whole, spend that billion dollars in the homes, through tax breaks or whatever, and take on tailings at some other time, or to put it in perspective.

On the man-made side, medical x-rays contribute 11 percent of the total dose. Nuclear medicine is about one third that of medical x-rays.

COMMISSIONER BERNTHAL: I also want to supply one more small piece of context here, which shouldn't be lost. And that is that the EPA's estimate, I believe, for the cancer deaths caused by this radon problem -- assuming of course, you believe the linear hypothesis, but that's what everybody cites -- and the EPA's estimate of 5-20,000 deaths per year, is in the same ballpark as the deaths estimated from latent cancers for the entire population exposed to the Chernobyl event for

the next 70 years -- for the lifetime of all of that population.

So, in one year, we expect in this country from radon in basements, roughly the same number of deaths as are being attributed to the entire exposure from the Chernobyl event in the Soviet Union. And I think that indicates the magnitude of the problem.

MR. AUSTIN: Consumer products produce about three percent of the total dose. There it is building materials or water supplies result in doses to the public. Water supplies evolve radon, which is then breathed and gives the dose to the person.

Tobacco can be a very significant source of radiation exposure because of Polonium-210 and that radionuclide is of interest later in the presentation.

The purpose of this part is to put NARM in perspective of all the other contributors to the potential for cancer from radiation exposure.

[Slide.]

On the next viewgraph, the question occasionally arises -- I think Commissioner Bernthal asked it back in July -- as to why NRC regulates Iodine-131 and not Iodine-123 in the medical institutions. The direct and short answer to that question is history. So we performed the review of the legislative history of some but not all acts addressing

ionizing radiation in general and NARM in particular. It is important to recognize that the Federal Government does not create an authority to regulate public health and welfare; rather, the Federal Government preempts the states' rights to do so. The states can and many do regulate NARM.

Historically, it appears that Congress has looked to the states as having the primary responsibility for protecting the public from NARM. Historically, Congress has kept NRC's activities and responsibilities linked to the neutron chain reaction. We regulate Iodine-131 because it comes from nuclear reactors, but we do not regulate Iodine-123, because that comes from cyclotrons. Telerium-124, which is a naturally occurring stable isotope is bombarded with protons and two neutrons come off and you have Iodine-123. No neutron chain reaction involved.

I should point out that Iodine-123 is replacing Iodine-131 in medical procedures because the Iodine-123 results in a lower dose to the patient, so the physicians are naturally going to be decreasing the dose to the patient.

COMMISSIONER BERNTHAL: Are we sure that it isn't also because they don't have to worry so much about NRC regulation and oversight in some of these areas with accelerator-produced materials?

MR. AUSTIN: In my many calls around the country trying to get information on problems, some suggest that

regulation does have a bearing on the route they go. Linear accelerators are replacing Cobalt-60, but keep in mind that the linear accelerator is much more versatile than Cobalt-60.

We regulate industrial uses of Polonium-210 because it is obtained from neutron bombardment of Bismuth-210. We do not regulate Polonium-210 in tobacco because it gets there naturally. So there are many dichotomies about what isotopes we regulate and what ones we don't.

With respect to Congress' preemption of states' rights over NARM, EPA has been given jurisdiction over NARM in the environment. With respect to radon and radon in the home, the EPA Department of Housing and Urban Development, the Department of Health and Human Services all have interest in and jurisdiction over NARM. Consumer Product Safety Commission has jurisdiction over NARM in consumer products. The Department of Labor has jurisdiction over NARM in the workplace, and of course the Department of Health and Human Services has jurisdiction over NARM in the medical institutions. Many other departments have interest in the exposures to ionizing radiation and to NARM.

Back in the '70s, the Bureau of Radiological Health had the primary responsibility for protecting the public health and safety from sources of radiation, but that department -- that bureau was split up and many of its activities were given to other Federal agencies, and that raised the question as to

how to integrate all these Federal programs.

In 1981 Senator Glenn proposed legislation to create a lead agency having responsibility over ionizing radiation. The Administration responded that legislation was not necessary and in 1984 the President formed the Committee on Interagency Radiation Research and Policy Coordination to carry out that integrating function.

[Slide.]

The next viewgraph is a description of CIRRPC and its executive committee. What I would like to do is call to your attention the top box on that viewgraph. If that box looks cluttered, it is, because the landscape of Federal involvement in ionizing radiation is very cluttered. There are 18 agencies represented on CIRRPC and their activities are being coordinated by CIRRPC. The second message on this viewgraph is that there is a lot of jurisdiction over ionizing radiation already out there.

NRC is represented in CIRRPC by Denny Ross and Bob Bernero.

[Slide.]

On the next viewgraph, we looked into what the states have been doing with respect to NARM. In 1977, the Conference of Radiation Control Program Directors, that is composed of representatives from all 50 states, some large municipalities and a few territories, published suggested state regulations

for controlling NARM. Ten years later, all 29 agreement states had licensing programs for discrete sources of NARM. Four non-agreement states also had licensing programs for NARM. Of the remainder, 2 states have voluntary or partial licensing programs, 14 states have registration programs and one state had no program at all. For a perspective on this latter state, Dr. Carol Marcus, who participated in the recent Commission meeting on the medical use of isotopes and who has read the NARM report, recently wrote to me, stating that this one state, Montana, had a total of 6 physicians and 15 technologists in The Society of Nuclear Medicine in the entire state, observing that it is not really big business in Montana. So that one state not having a program -- one needs to look behind that and what would one do, giving such a low level of activity in that state.

So this 1987 level indicates that there is increasing activities by the states to control NARM hazards. Nonetheless, in August of 1987 the Conference of Radiation Control Program Directors once again urged that the NRC seek legislative authority over NARM.

[Slide.]

On the next viewgraph we posed the question how should one decide this issue. I postulated 8 sub-issues in the form of questions, the answers to which would provide a better basis for making the overall decision on whether to seek

legislative authority.

The first question is, is there a national problem with NARM? Radon clearly is a national problem, but other agencies are working on that problem. Radium disposal is a problem, but EPA is developing a regulation on defining low-level waste, which would include NARM in its definition. Utah recently approved a site for burial of NARM waste.

Are there integrated controls over NARM? The answer is no, but that is true also for controls over ionizing radiation exposures in general.

Would NRC regulation overlap other agencies' jurisdiction? Yes, it would. Many agencies already have jurisdiction.

Are the state controls adequate? From my review of the August, 1987 request of the states on dealing with problems with NARM, I concluded that the state controls are not inadequate.

Is NARM a Federal, state or professional responsibility? In some cases, it is a Federal responsibility. In some cases, it is a state responsibility, and within the medical institution there is a natural self-interest to handle the radiopharmaceuticals produced by cyclotrons in a very careful manner. Lawsuits, loss of practice is involved, so there is a professional interest in doing the right thing with cyclotron-produced radiopharmaceuticals.

Has Congress looked to the NRC for NARM regulation? The answer there is no. Congress has kept NRC, and before AEC's, jurisdiction linked to the neutron chain reaction and has never wavered from that.

What are the resource implications? They could be enormous. In just looking at the universe of NARM, it could involve tens of full-time equivalents.

Would NRC responsibility for NARM change the nature of NRC? Yes, it would. It would break our historic link to the neutron chain reaction and it would likely get the Agency involved in regulating the use of cyclotrons and accelerators. Those machines must work right to get the correct radionuclide. They must be maintained to keep from dosing the employees and users, and we do not have expertise in cyclotron designs or use.

From the evaluation of these questions, we developed five options for the Commission.

[Slide.]

The first is status quo. The second was to go ahead and seek legislative authority to regulate NARM.

The next two were subsets of the first. Seek authority over radium disposal only, or seek authority over cyclotron-produced radionuclides for medical use only.

And the last option was, refer the issue to the Committee on Interagency Radiation Research and Policy

Coordination.

The report, the NUREG-1310, addresses the pros and cons of each of these options. Our evaluation of those leads to two recommendations to the Commission, and that's on the next Vu-graph, Vu-graph 8.

[Slide.]

The first recommendation is, refer the issue of NARM regulation to the Committee on Interagency Radiation Research and Policy Coordination for the purpose of integrating the NARM hazards into the other federal programs and other federal agencies' jurisdictions to ensure that the most significant hazards are being addressed, without undue attention to lesser hazards.

And the second recommendation is to inform the governors that NRC has referred the NARM regulation issue to CIRRPC for resolution.

That concludes the staff presentation.

MR. STELLO: Mr. Chairman, at this time what I propose is, as I've already noted, to introduce Mr. Al Young who has got a presentation for the Commission. But, if I may, I would ask Carl Kammerer to introduce the others who are here at the table with us. Then, at your pleasure, we can go directly to Mr. Young and the others on questions of the staff on our presentation.

CHAIRMAN ZECH: Fine. We'll go through as you

recommend, and then we'll come back for questions. But before we go on, I'd like to ask Mr. Austin, would you repeat again the recommendations.

MR. AUSTIN: The first recommendation is that, in the context of the NARM set of material, never being regulated by the Federal Government as a class, refer that to the Committee on Interagency Radiation Research and Policy Coordination for the purposes of integrating any hazards associated with NARM that are not now being overseen by some federal agency. Integrate that into the over-all federal program on protecting the public from ionizing radiation. They are the integrating committee.

CHAIRMAN ZECH: All right, good. And then also inform the governors.

MR. AUSTIN: Inform the governors that there is this NARM issue. We have been asked by the Conference, representing the states, to seek legislative authority from the governors, and that we have referred this matter to a committee to integrate it within all the other programs.

CHAIRMAN ZECH: All right. Thank you very much. We appreciate it. Now, Mr. Kammerer?

MR. KAMMERER: Mr. Chairman and members of the Commission, it gives me great pleasure to welcome the three gentlemen representing the Conference today.

On my immediate left is Chuck Hardin, the Executive

Secretary for the Conference. He formerly was the Director of the Kentucky program.

Skipping over one, Bill Dornsife from the State of Pennsylvania, and he's the Chairman who pulled that report together that you have in front of you.

And Terry Strong, the Chairman of the Radiation Conference and Director of Radiation Control for the State of Washington.

We'll go to Mr. Young.

MR. YOUNG: Mr. Chairman and Commissioners, I'm the Chairman of the Committee on Interagency Radiation Research and Policy Coordination. That's a mouthful. We have the acronym Chirpic or Sirpic, CIRRPC, one of many government acronyms.

And I'll throw another one at you. CIRRPC is a committee of the Federal Coordinating Council for Science, Engineering, and Technology of the Executive Office of the President. The Council was known as Fixit, F-C-C-S-E-T.

What is the CIRRPC program? In May, 1984, the Office of Science and Technology Policy, at the direction of the President's Science Adviser and the Director of OSTP, Dr. George Keyworth, we organized the CIRRPC program because there were some needs out there that were obviously not being met.

Although the Federal Government had a very effective committee to address radiation research issues, that committee was separate from a committee that was used to direct policy

related to radiation matters.

Now, the Radiation Research Committee met frequently. It was under the direction of Dr. Wyngaarden out at the National Institutes of Health, and was viewed by many of the agencies, quote, as an NIH committee.

On the other hand, the policy body had not met in 2 years, and was located within the Office of Science and Technology Policy. Obviously, the issues related to radiation research were considered separate from policy. As a consequence, I don't think we accomplished very much for quite a period of time.

The fact that all of the agencies were going their individual ways in radiation research and policy issues certainly pointed out that the Federal Government was doing a poor job of coordination.

Hence, Dr. Keyworth established, under the Federal Coordinating Council, the committee. We established it in May of 1984. It was tasked immediately with 3 things: to coordinate radiation matters between agencies, to provide advice on the formulation of radiation policy, and to review the radiation agendas of the federal agencies.

Were we, as a nation, proceeding in the right direction? We were concerned about the nuclear option for the country, and we felt that there had to be some getting together by the federal agencies in a coordinated plan.

We are now 4 years into the program. We have 18 agencies that cooperate. Fourteen of those are research agencies. The other agencies, in fact, have programmatic responsibilities.

A good example is the Office of Management and Budget. Clearly, a very important agency to all of us, those of us who have federal budgets. And, by bringing OMB to the table along with the other agencies, it had a great deal of benefit to be derived for us.

I must tell you that only recently did we become aware of your Nuclear Regulatory Report No. 1310 on NARM. I have had numerous conversations with Mr. Austin, then, in the last month or so.

The report has not been thoroughly reviewed by the CIRRPC-member agencies. You should be aware of that. We have not had an opportunity yet to have a detailed review of that report.

The report has been made available to our Executive Committee. Mr. Austin showed you a slide of that Executive Committee, consisting of members from 6 different federal agencies. We have all looked at that. We have looked at the recommendations in that report.

Let me, before I offer to accept that recommendation, if it were to come our way, let me give you some ideas about how we handle projects within the Committee.

I would point out that the studies to date have been either identified as of general interest to members or are issues that have been initiated by individual members. All of the projects that the CIRRPC takes on, then, are either issues that have wide interest by all of the agencies -- radiation standards are a good example -- or have been referred to us by a specific agency.

The Environmental Protection Agency was very concerned over the research agenda for non-ionizing radiation. The Department of Energy has been very concerned over the neutron quality factor.

Now, what sort of a research agenda should we have for the issue of neutrons, of biological effectiveness? So, individual agencies have come to us, and then there were areas that were very broad within the CIRRPC organization that we felt were important to put out on the table and explore.

Most of the studies have been conducted by our Science Panel. The Science Panel meets monthly.

In addition to the Science Panel, we have active at this time 6 subpanels. We have more than 60 scientists at any one month meeting on issues of radiation right now. We coordinate those through our CIRRPC office, and we have a technical support contract with Oak Ridge-associated universities that helps provide the continuity and the staff to oversee that these activities are constantly moving forward.

Our biggest concern is when one takes on an issue, if that issue can be resolved, we then get out and work hard at trying to get resolution, trying to develop a consensus within the scientific body and within the policy body of our organization.

We have 2 major bodies. We have a science panel with scientists from 14 federal agencies, and we have policy representation, an Assistant Secretary or very high level individuals within the federal agencies, that sit on our policy body. The policy body normally meets quarterly or 2 or 3 times a year, depending on how many issues we have to bring before the policy body.

But the point I'm trying to make is, when we take on an issue, we try to resolve that issue in a timely manner. When we find an issue cannot be resolved in a timely manner, there's either a very good scientific reason -- we don't have enough basic research to resolve that issue -- or there simply can be no consensus within the policy arena.

We have had issues that we have not been able to resolve in a timely manner. We've simply had to refer them back to the agency with an apology that this is not the time. This is an issue that simply is too difficult at this point and for a variety of reasons it cannot be resolved.

So, I'm hinting to you that, if we were to take an issue on like NARM, we would give it our best shot. But I

can't promise you that all issues can be resolved successfully in the Federal Government. Clearly, there are some very difficult issues to work with.

We have taken an issue like radon. We divided indoor radon into two component parts.

First, what were the scientific issues related to exposure to indoor radon? How good are the scientific data, the epidemiologic databases on which to make decisions?

We critically reviewed those. We interfaced with the National Academy of Science, as they continued to work on BIER-IV at the time.

Then we took the scientific database, once developed, and asked the question, what are the policy implications. We then turned to a policy body of CIRRPC, a policy subpanel, and asked them to explore, then, the policy implications by the various federal agencies. Five agencies had major programs with regard to indoor radon.

The good news is that, in fact, we've developed a federally coordinated position on what this nation will do on indoor radon. That report is now being printed, and will be distributed very shortly.

We've taken a look at radiation measurements, records, and control. The neutron quality factor. We have taken a look at the pre-disaster planning for human health effects research. Non-ionizing radiation. Ionizing radiation

risk assessment.

We've developed a compendium of radiation protection standards and guides that will be released very soon, that talks about what we consider 28 major standards. What are the scientific and technical bases? What are the legal bases for those standards? If we're going to address those differences that occur in federal agencies, we have to have a thorough understanding of the bases of those.

And we've taken a look at international activities. We've even completed a project with the National Council on Radiation Protection on the U.S. population radiation exposure assessment. And I'm pleased to see that you cited that report that we played a major role in with regard to NCRP.

Okay. CIRRPC activities related to NARM. I've already suggested to you that many of the issues that CIRRPC has been working on and has been resolving are issues, in fact, that deal with federal radiation policy; mutually consistent coordinated radiation regulations and standards, and, particularly, those involving multiple federal agencies and jurisdictions.

So, NARM is certainly an issue that could come before the Committee.

We have established science, tried for consistent approaches among agencies, and we've tasked our ORAU, or Oak Ridge Associated University Technical Support Contractor, to

continue to develop and work on this Radiation Protection Standards and Guides. These last 2 efforts are essential to understanding the basis and relationship between standards, clearly an issue that would have to be addressed with regard to NARM.

If we undertook the NARM program, we do believe it would be consistent then with our charter. I would, however, point out to you, that we would like to see that be a task given to us by the Nuclear Regulatory Commission. But specifically, we would like to have it detailed as to what you would expect. The recommendation that occurs in your report, brings in the broader issue of ionizing radiation. I would hope that you would not expect that broader issue to be addresed.

So we would need to have a specific request from you, limiting the charge. And I think that could be done. The response by CIRRPC would relate then to the level of effort that would be required, and how that request fits into our future plans for regulatory review. Clearly, I think it would. We would take on the task, I believe, in a very timely manner.

I would tell you, that in order to accept the task, we in fact, turn to the other federal agencies, and to the policy body of CIRRPC, with the task spelled out in detail. We would identify a sub-panel. We would ask the policy body to approve that task to be undertaken, because that task will

require financial resources. CIRRPC operates through the contribution of resources from 14 federal agencies. Our research budget, approaches $1.5 to 1.8 million a year.

So that is where we would get the resources -- from all of the federal agencies, to undertake the task. It would not be something that would be funded by NRC to the CIRRPC program.

Mr. Chairman, I think I've given an overview on that whole thing. I brought 2 reports with me, just to show you what CIRRPC has been doing. I've given you our third annual report. Obviously a fourth one is now in preparation. We're coming rapidly to the end of our year. And I've also given a report out on the Identification of Federal Radiation Issues, to show you that when we made a survey of the federal agencies, clearly there were some agencies that had concerns that related to the NARM issues.

That concludes my remarks.

CHAIRMAN ZECH: Thank you very much. I appreciate it.

COMMISSIONER BERNTHAl: Let me just make a comment here, if it's needed, as to why there is some concern on the Commission at least, with this issue, and why I would hope that CIRRPC would undertake the issue to try and reach some sort of resolution, and a resolution that I would hope would have a certain continuity through the change in Administrations at the

end of this year.

The impetus, at least for me, and I suspect for other members of this Commission, to come to grips with this issue, of course, is partly rooted in the history -- that we aren't the first ones that have looked at this and seen that there needs to be some order set to what appears to be at least a small corner of chaos in the oversight of potentially dangerous materials. But I'm reminded of the rather strenuous criticism that this agency was subjected to through no particular fault of our own, I would say, in connection with an incident at the Sequoyah Fuel Cycle Processing Facility down in Oklahoma a year or so ago.

Well, the analogy isn't perfect. But there, somewhat as here, it was clear that in connection with our responsibility for what happened to be a uranium compound, although the uranium material itself was not particularly dangerous, the chemical compound was particularly dangerous.

And in fact, that was the source of some deaths on that plant site. And it was also clear that exactly who was responsible for the chemical part of the hazard there -- we were, in a way, but whether the expertise was here, and whether we had carried that responsibility out in the same way that EPA or other agencies more familiar with chemical hazards might have carried out, that was not so clear, it seemed to me at the time.

So that at least was one issue where, in connection with the more natural responsibility of this agency under its statutory authority, we realized that there was -- these aren't my words even, they're words of members of Congress -- that there was a regulatory gap, apparently. Or I believe they were the Chairman's words at one point, in fact.

Well, that's part of the reason, at least for me, why we developed a new sensitivity, perhaps to this area that has kind of festered in this agency now for 10 years or more. I just wanted to lend that little bit of comment.

MR. YOUNG: Let me comment. I think your point is well taken. NARM is an issue that just isn't NRC.

COMMISSIONER BERNTHAL: I understand.

MR. YOUNG: It is an issue that has to be looked at by the Environmental Protection Agency, by the Department of Energy, by the Department of Defense, by Health and Human Services.

COMMISSIONER BERNTHAL: And neither was this issue in Oklahoma.

MR. YOUNG: Exactly, exactly. And clearly, that's the advantage of the CIRRPC program. I think you would be very pleased to see that agencies are sitting around the table at these meetings and talking with each others. We've gotten beyond the turf battle. Now we can begin to interact, and that's what's been happening. I think this is the success of

the CIRRPC program, is that we're working as a Federal Government in trying to resolve issues.

I would point out, that as we took on the radon issue, we realized its importance to the states. And we, in fact, invited a representative of the Conference of Radiation Control Program Directors to join with us on radon deliberations. And that individual contributed greatly to the preparation of our report on radon.

So here's an example of where, in fact, we have in the past interfaced with the Control Conference.

CHAIRMAN ZECH: Thank you very much. Can we proceed? Mr. Kammerer, who's going to be next?

MR. KAMMERER: Mr. Strong.

MR. STRONG: I want to thank you for scheduling this meeting in part, at our request, at a time when it will occur, just immediately prior to our annual meeting. The proceedings here, we'll take back with us and we appreciate that very much.

We have a document to leave with you today, describing what we say, and what we have to say, and some other details, and we'd like that to become part of the record. And if I could, let me enter into the discussion that just went on here.

CIRRPC may or may not be the solution. The concern, I think that we have, is that we don't want to shuffle it once too often. Everybody's responsibility is nobody's

responsibility. And we're here because we think it's a significant issue, and one more shuffle may not be what the issue needs.

Our purpose in being here today is to share our concern for this issue as a significant potential public health problem. We want to reaffirm for you, our position on the NARM situation, and we want to comment on your document, NUREG-1310. Basically our position is that we believe there should be a uniform nationwide regulatory overview, oversight of the NARM issue. And we're talking about discrete NARM sources, not the universe of NARM, not yet anyway.

It's the discrete sources of NARM that we have concern about. And we believe that the Nuclear Regulatory Commission is the proper agency to do that. And we believe that because you have the expertise. You have the mechanism. You have the experience of regulating the uses of radioactive materials in places where discrete sources of NARM are in use now.

And for these reasons, I think it becomes appropriate for you. And with that out of the way, I want to turn to Chuck, for him to describe for you, exactly who the conference is, and how we do our work.

MR. HARDIN: Thank you, Terry. The organization called the Conference, was formed in 1968, as a result of several state radiation control directors getting together and

realizing that non-uniformity in other areas of radiation was existing in the United States. It was formed then, for the primary purpose, so that a common forum could exist, where states could coordinate technical and administrative information between themselves, as well as a coordinating point for states to talk with the Federal Government.

Currently there are 430 members of the organization, made up of, and the voting members are the program directors of each of the respective states, the District of Columbia, and Puerto Rico. Of these members, the primary work is performed through a variety of committees and taskforces that have been established for a given issue or given program. A listing of these committees and taskforces are in the handout document, which you may look at your leisure.

The Conference is controlled, policywise, by an executive board, which is made up of 7 state persons that alternate on basically a 3-year cycle through the election of the membership.

This issue of NARM has been on the foreground of the Conference for many years -- from its very beginning as a matter of fact. I think the history will show that it's been an issue with the states since the mid to early 60's. And we still continue to support the position that it is still a major issue. And I would like to re-emphasize Mr. Strong's comment that our major concern is discrete sources -- emphasizing

discrete sources, not the major universe, big world of NARM that's been discussed here so far. It's discrete sources that are a major concern.

MR. STRONG: Because of who we are, who we represent, I don't think that I am being presumptuous or that we are being presumptuous, when we remind you that the states, the agreement states, regulate 65 percent of the use of licensed radioactive materials. So, we come with some background. The 29 agreement states who essentially regulate the discrete sources of NARM now in the same way that they do the other radioactive materials. And I qualify "essentially," because I think if we did an in-depth study, you might find that it's not exactly the same.

I know in my state, we end up with issues that, in our normal course of events when we are stuck, we call you. We call our counterparts in your agency. And you don't regulate NARM. There isn't really somebody to call when we get stuck. That's in the 29 states. In the other 21, there are 4 states that have really very good programs where they are licensing and registering. There are 5 more states where they are doing some registration, and some inspection.

And you get down to the bottom 12 states, and I think maybe that begins to be our bottom line. Although the whole issue needs to be looked at, there are 12 states where really, the issue is not well controlled at all. They happen to be

non-agreement states, these 12 that we're talking about, but essentially there is a very, very weak program of regulation in those states.

And what we're talking about here, is the federal oversight, the federal reviews, somebody, some one place where the dollar stops -- the buck stops here. That kind of oversight is what you're talking about.

I've got some specific examples, and I think they've been covered as we've gone around the table, about inconsistencies. And we can come back and talk about those kinds of inconsistencies and the specific examples that I had cited. But I think that I would go straight to Bill now, and ask him to look at your document, compare that with our document and describe the specifics about your report.

CHAIRMAN ZECH: Thank you very much. Proceed.

MR. DORNSIFE: I think the first point I'd like to make is that about 10 years ago, the NRC staff organized a taskforce that looked in detail at the NARM issue. It was documented in NUREG-0301. The results and conclusions of that report are as valid today as they were then. And the recommendation then was that there is a potential health and safety problem because discrete NARM is not consistently regulated. And they recommended that NRC pick up the ball and provide that oversight, and it be included under the Atomic Energy Act.

The report also indicated that there are about 60 accelerator-produced isotopes that are in general use in medical practice. It should be noted that about two thirds of those isotopes also could be produced in a reactor. So you could have side by side, an isotope that's accelerator-produced, and an isotope that's produced in a reactor -- one regulated, one not. We at least have some indication that people are using accelerator-produced isotopes to avoid regulation.

No doubt about it, discrete radium sources are the most significant from a health and safety standpoint. Because as you well know, radium has a very long half-life. It's very similar in toxicity, in fact some think it's even more toxic than transuranic elements. The big problem though, particularly when you're dealing with sealed sources is, the daughter product of radium is radon. And if you have a leaking source, the gas leaks out and causes a real, real bad contamination problem.

NUREG-0301 indicated that since 1910, it's estimated that about 2,000 Curies of radium were either imported into, or manufactured in the United States. From our records, we can probably account for maybe 200 Curies being disposed of in commercial sites. The Conference did a survey in 1984, which could identify about 130 Curies that are either licensed or registered in those states that have those programs. So that

leaves about 1600 Curies that for the most part, are somewhat unaccounted for.

I think it's also important to note that in disposal of source material, eventually radium becomes a dominant risk when you dispose of source material. It eventually decays to radium, and that becomes by far the dominant risk. It even dominates the risk of transuranic disposal, eventually. So you have a NARM problem even in the middle of a waste disposal, eventually.

One of the real big concerns though, I think, is that because of the inconsistent regulatory scheme, there really is no uniform way of reporting NARM incidence. So, we really have no idea if there, indeed, is a true health and safety problem out there. Also, there is no way to share information, and there is no way to have lessons learned for the use of NARM's. So, that system is not in place, and I think one agency having authority and establishing national standards would help immensely from that standpoint.

We really believe that the inconsistent regulation that currently exists and because of that, the non-uniform national standards do create potential health and safety problems. I'll give you some examples.

In many place there is insufficient regulatory control over the design, the quality control, and distribution of NARM-source to the manufacturers of NARM sources. Generally

licensed NARM sources -- these are things that are available for consumer use. They may not be receiving adequate review to determine whether, indeed, they are creating health and safety problems because of their use.

A large part of this unaccounted-for NARM, the radium, went into the manufacture of instruments and devices for the military. These were manufactured under conditions -- probably the regulatory conditions were not necessarily up to par, and their use was not really controlled. And these instruments and devices are showing up all over the place and creating, in some cases, some real severe potential health and safety problems to the public.

Also, there seems to be cropping up, new sources of discrete NARM. And remember, we're emphasizing discrete, not the diffuse NARM. These are things like ion exchange resins that are used to clean up ground water that is contaminated by radium. We recently found some pipes used in oil and gas production that have a scale that is a very high concentration of radium. Because of the non-uniformity, it's very difficult to control the use and eventual disposal of these materials.

This situation also creates interstate commerce problems, as you can well imagine, when these non-regulated sources cross state or even international boundaries, it creates real problems with the use and control.

In fact, some states have gone as far as to deny

reciprocity, because some states do not have, in their opinion, adequate regulatory programs. So, it really creates some interstate commerce problems, also.

I think our major problem, now, as was indicated, with the NUREG-1310 document is the fact that it considers the entire universe of NARM. We are talking about a very small part of that, discrete NARM.

I think, because we are really talking about that very discrete part of it, the budget and the resource drain on NRC to take the lead is going to be minimal.

We also believe that those agreement states and non-agreement states, that currently do have adequate licensing programs, will continue. In fact, we proposed a grandfathering method to get those states under an agreement program. So, we're really not infringing upon States Rights.

I think one of our major problems, again, with the NUREG-1310, is that the staff didn't include specifically our recommendation. I mean, we recommend specifically that NRC look at regulation of discrete NARM, and that was not even one of the considerations, one of the recommendations.

Although it's true, as stated in NUREG-1310, the Federal Government does have, in fact, too many agencies have, regulatory authority over the use and disposal of NARM. That's what creates the problem. There is no one lead agency, like we have in the regulation of byproduct materials.

And what it tends to do is create confusion among the users and the various agencies as to who is going to take the lead. And that's, I think, one of the real major problems.

We feel, because the health and safety risks involved with regulating this discrete NARM are very similar to the health and safety risks involved with regulating byproduct materials, NRC should be, in fact, the lead agency.

We also agree that disposal of NARM, particularly, radium, is one of the major problems. I sit on the Low-level Waste Forum. If you're not familiar with it, it's a group of state and Compact folks that talk about issues of mutual concern with solving the low-level waste problem.

One of the problems we always come back to is NARM. As NUREG-1310 points out, the Conference has tried to do some things to facilitate disposal of NARM. We have developed a program that indeed is trying to facilitate disposal of NARM.

However, at best, this program is a temporary one, and it's a stopgap measure. There are a lot of other very important issues that the program does not address.

As was mentioned, EPA is proposing to regulate the disposal of discrete NARM sources. Now, EPA is doing that specifically at the request of the states. We felt we could at least get that part of the problem solved.

If you're not already aware of it, the proposed regulations -- and it should be coming out this summer -- say

that discrete NARM, the way they intend on regulating NARM, is to regulate under TSCA. But they're going to propose that NARM sources be disposed of in facilities that are licensed under the Atomic Energy Act.

So, basically, whether the staff and NRC likes it or not, they're going to be taking over regulatory control because of the way EPA is implementing that requirement.

I think, also contrary to NUREG-1310, the 2 nanocurie per gram limit that EPA is proposing in their standards is not a below-regulatory-concern limit. What it is is a cutoff limit between discrete and diffuse NARM, and NRC could use a similar limit to define what they would regulate the use of.

It's my opinion anyway that the diffuse NARM, which is very similar to uranium mill tailings, is probably more appropriately regulated under RCRA-type standards.

Another point that I think it is important to note, and this is an issue that comes up on the Forum frequently, is that NARM is not included in the definition of low-level waste under the Low-level Waste Policy Amendments Act of 1985. In fact, the reason it's not included is that some of the Congressmen wanted to broaden the definition from discrete to include the entire universe of NARM.

And, since that would have included a lot of high-volume low-activity waste and it's really not suitable for the kind of disposal facilities we're developing, they dropped the

issue. That's the real reason it's not in there.

Probably one of the bigger concerns, though, that the states have concerning disposal of NARM is the fact that, because NARM is not included in the Policy Act, there is no responsibility for disposal of greater than Class C NARM. And you recognize, particularly, these radium discrete sources, if you look at the source all by itself, these sources will, for the most part, be greater than Class C.

Basically, I think, the tack that I would like to see followed there is, if NRC does indeed take responsibility for regulating discrete radium sources, they will have to develop a greater than Class C limit for these materials.

As you are aware, NRC is also proposing a rule that would redefine high-level waste. And as you are probably also aware, the states and most commenters requested that NARM specifically be included in that rule.

If NRC indeed adopts the position that anything greater than Class C is high-level waste, then, in fact, greater than Class C NARM will be a federal disposal responsibility and satisfy the major concern that states have.

I appreciate the opportunity, and thank you very much.

CHAIRMAN ZECH: Thank you very much.

MR. STRONG: Chuck has a couple of words, and then I've got a closing shot.

CHAIRMAN ZECH: All right. Proceed, please.

MR. HARDIN: My only comment additionally is relative to the status of the states and their management of the NARM issue. By a recent telephone survey I did last week, I determined that many states, even though it appears they have a good program of registration, when you go down and look deeply into what they are doing, specifically their inspection enforcement program, you'll find they are extremely weak.

And even though it appears so, by the misunderstanding of registration, they are not. And that is covered in this document we will hand to you on the status of the states.

CHAIRMAN ZECH: All right. Thank you.

MR. DORNSIFE: Could I just add something, Chuck, from the technical standpoint?

MR. HARDIN: Sure.

MR. DORNSIFE: I think one point -- and I should have made it when I went through -- was the fact that you should recognize that in those non-agreement states that are not regulating the use of NARM, the NRC does regulate byproduct material use. There is only a handful of NARM-only users out there.

So, I think it's almost unconscionable to me to have an inspector go in and see NARM use here and byproduct use here, and not even look at that NARM use. So, from that

standpoint, we really don't see it as a real drain on resources.

MR. STRONG: In winding up, I'd like to recognize the, I guess it's yeoman duty that John did in putting this report together for you in such a short time and in such a complete way. And we don't really blame him that he didn't end up with the right conclusion.

[Laughter.]

MR. STRONG: We're good bureaucrats, too, and we understand that issues of budget and resources and politics would influence the way the report is sent to you.

While we can understand that, we would come back and deal with the issue, which is the potential for public health and environmental problems that exists out there.

We believe that all of the possibilities for the Nuclear Regulatory Commission to do something now were not exhausted, and we look at maybe some examples there.

We think that, if you wanted to, if you made the decision to do something about the issue, that you probably could, if you determined that you wanted to.

If you can't agree, we believe that maybe getting the issue back to Congress is the way to go, and let Congress make a decision, rather than do the bureaucratic shuffle on it, and we think that that would be better.

If that is something that you can't do, then it would

be our intention to continue to deal with the issue. Maybe there is a solution, working with EPA and with NRC, a delegation of responsibility. But we would like to go back to Congress, continue to try to get it there.

And I guess I want to leave a question with you. If we were able to get it on the agenda in Congress, and given the resources and the authority for NRC, would your position still be the same as John has sort of laid it out? Would you fight the issue, being delegated the responsibility, if the resources and the authority were given to you?

Chairman Zech, I've met you twice before, and this morning in your office was the third time. And on each of those occasions you have indicated that you were recognizing the preeminent responsibility of government to protect the public health and safety.

As you spoke to us, you were saying that the NRC was going to be there to help. I want to remind you of that, and ask, on behalf of the Conference and, I think, the states, that you do look hard at this and that we do get something moving on the issue.

CHAIRMAN ZECH: I think we have helped in the past. Certainly, it's my impression that we've done that, and certainly, within the law of what we can do, we would certainly want to assist in the future, no matter how the ultimate decision comes out.

So, we are responsible for public health and safety within a statutory understanding. But, no matter what, I think we have and we would continue to assist. And so, that's my intent.

MR. STRONG: Yes, sir, and we appreciate that very much.

CHAIRMAN ZECH: And I think that my colleagues feel the same way. We want to solve the problem, or help solve the eventual problem. But, in any case, we're going to continue to assist as best we can.

Does that conclude?

MR. STRONG: Yes. This concludes our presentation.

CHAIRMAN ZECH: All right. Thank you very much. We'll have questions by both Commissioners. Commissioner Bernthal?

COMMISSIONER BERNTHAL: Let me just ask one straightforward question here before I get into some other details. Do I take your presentation collectively to imply that the agreement states, generally speaking, still see, if they ever saw, still see the regulation of NARM by the NRC as being necessary and/or desirable?

And, Carl, you might want to comment on this, as well.

Or, do your comments not represent at this point any polling of the agreement states as such?

MR. HARDIN: The position paper that we have on the issue was a vote of our entire membership. That does include agreement states.

COMMISSIONER BERNTHAL: So, this, in effect, represents the agreement state position. And was that a fairly unanimous position, or were there minority views expressed, or where are we on that?

MR. HARDIN: When this position was taken in '85, it was the great majority of the membership. There were some who disagreed with the position, some of which were both agreement and non-agreement states. But the great majority of the organization agreed with the position and voted on it, including agreement states.

MR. STRONG: The agreement states, as a group, when they meet each fall, have almost traditionally voted on this issue, asking the NRC to look at this. And, again, the vast majority have voted for it.

COMMISSIONER BERNTHAL: So, we have the extraordinary circumstance here of states themselves asking the Federal Government to apply some uniform protection and regulatory standards that currently they perceive don't exist. Is that a fair statement?

MR. STRONG: Yes.

COMMISSIONER BERNTHAL: Okay. Thank you.

I want to get back a little bit to some of the points

that you raised in your presentation, John. I understand you were primarily responsible or one of the principal workers on this paper. And, again, I want to congratulate you on what I think was an outstanding job.

I, too, have some concerns with the conclusions that you've reached. And let me say at the outset that I share the concern about the NRC. In fact, it made me sit up and take notice when you mentioned the possible NRC regulation of cyclotrons and accelerators.

I used to operate a cyclotron in my research for many years -- the Rolls-Royce of cyclotrons, in fact -- at Michigan State University.

The thought of the NRC coming through that facility, which was a research facility, regulating everything that we did, sent a chill down my spine, to tell you truth, because I was involved in basic research and I was not particularly of the opinion that I wasn't quite capable of determining my health and safety needs as I operated that facility.

So, I'm very sensitive to that point. In fact, it seems clear from that mere comment that we would need to look very carefully at how we would approach that kind of regulation.

But I think there has been suggested here a possible alternative. In fact, one that, it was correctly pointed out, did not appear in your list of recommendations. And that was

that we look, rather, at discrete NARM.

Now, discrete is perhaps not so easily defined. But for want of a better term, that means accelerator or naturally-produced material, I guess, that's in one place as a source, or at least is easily identified. That may not be so easy from a regulatory standpoint.

And it brings to mind the question of whether, for example, in a cyclotron facility the NRC could be in a position, not of regulating every aspect of the use and operation of that facility, as we do with reactors, now, for example, but rather, if that facility is being used for production of a material in radiopharmaceuticals or in the medical field. Whether we don't pick up our responsibilities somehow at the door, or perhaps in a defined area of the facility.

Would you comment generally on why that did not appear in your list of recommendations?

MR. AUSTIN: There is a medical procedure called positron emission tomography, and it involves cyclotron-produced radiopharmaceuticals. The radionuclides tend to have half lives of a few minutes to hours, so they are produced on-site.

What the physician does is use the cyclotron to develop a beam of protons which goes into a hot chemical lab -- they call it the black box -- where the appropriate chemicals

must be valved in. Then, with the product they process it a little bit more. And then it goes out that port and quickly into the patient, because of the half life.

They all must work as a system or the patient will not receive the right isotope or the right dose. So, they are fundamentally linked. So, I couldn't see a way one could back either to the exit port or just the patient, because the unit has to work as a system. If anything goes wrong --

COMMISSIONER BERNTHAL: Well, if you'll forgive me, I think you picked a straw man. I agree with the single case that you mentioned. That is an unusual circumstance, though.

In many cases -- in fact, I would say the majority of commercial applications here, as you know better than I by now, I'm sure. There are a number of facilities that are high-beam intensity cyclotrons, for example, that are dedicated to producing radioactive materials where the patient is not literally hooked up to the machine.

In the case you mentioned, I agree with you. But the vast majority of such facilities is a different matter, it seems to me.

MR. BERNERO: Bob Bernero from the Office of Nuclear Material Safety and Safeguards.

There's a spectrum of suboptions. One could define discrete NARM is radium only, radium of some concentration level. Or, one can broaden it into other longer-lived

isotopes, and set some sort of hazard index for it.

There is a whole spectrum of such suboptions. But when the study was done, it's a slippery slope, and that's the thing. We're outside the traditional, the logical, the apparently-logical role of the NRC as the Congress has viewed it.

And we're going down, because of analogy, we're going down a slope that says: Well, I'll take this discrete source, and then this one and this one and this one. And there's no logical truncation of it. That's the sort of thing you run into.

MR. AUSTIN: Commissioner Bernthal, I'd have to add that, while the PET modality may not be the dominant procedure in hospitals involving cyclotrons, as Mr. Bernero was pointing out --

COMMISSIONER BERNTHAL: In hospitals involving cyclotrons it may be a very important one. I'm saying, generally, with cyclotrons, though, it's a minor element, I would say.

MR. AUSTIN: But it would be there.

COMMISSIONER BERNTHAL: Certainly.

MR. AUSTIN: And the Food and Drug Administration is now wrestling with whether they are going to regulate this procedure. They have not decided whether it's a device or a drug. And the preliminary signals coming out are that they

prefer neither.

So, it is possible that, if we were to get into this, we would then have to rule on the safety and efficacy of these radiopharmaceuticals. So, not only would we need cyclotron people, we would need medical people to advise us.

COMMISSIONER BERNTHAL: Well, let me make a suggestion. I don't want to get off into a tangent too much here, but it would seem to me that the analogy with X-ray equipment, for example, in a hospital should be very clear. And perhaps not entirely clean, but fairly clean.

When you have a dedicated facility in a hospital, it's usually in the hospital because you're talking about short-life materials. You need the beam on target where the target might literally be the patient, or at least you're carrying out a procedure of the type you described, where it's an integral part of the equipment.

And there, it seems to me, it's entirely logical that FDA, much as it regulates the X-ray generating equipment, would have jurisdiction over that.

But the vast majority of these accelerator-produced isotopes are longer-lived. They're produced remotely. Perhaps not that remotely in the case of some of the shorter-lived ones, but that's the vast majority of the material.

And it seems to me there may be a logical and legally defensible line that can be drawn. So, I would urge that that

at least be taken under consideration.

Someone here mentioned the point of the side-by-side problem, where you walk into a facility, a hospital, for example. The agreement state does perhaps. And in the one case they see something that the NRC has jurisdiction over because it happens to be produced in a reactor. And right next to it, a different isotope of iodine that happens to be produced in an accelerator at some remote site.

That just doesn't make any sense, it seems to me. And that's the other side of the easy calls. You've picked a difficult call, and I agree it would not be so easily defined in regulation.

MR. BERNERO: But that same logic would have us look to an X-ray machine to regulate.

COMMISSIONER BERNTHAL: Pardon me?

MR. BERNERO: That same logic could draw us to regulate or consider regulation of X-ray machines.

COMMISSIONER BERNTHAL: What logic?

MR. BERNERO: Of saying it's side-by-side. Because many hospitals have cobalt-60 teletherapy and X-ray machines in the same department.

COMMISSIONER BERNTHAL: Well, no, I don't agree with that. I don't buy that, Bob. You could say that.

But what I'm asking is, can you draw some reasonable line legally where our responsibility might pick up and where

it might leave off. And the X-ray machine is a very easy one. That's not proven difficult for us to tell that X-ray machines ain't us. That has been no problem.

Now, John brought up an issue in an area that's a little more difficult, it seems to me. And I'm sure there will be gray borderline cases, but probably not many. I don't think it's so impossible.

COMMISSIONER CARR: Can I interrupt a minute? It seems to me like those on/off machines are pretty simple.

COMMISSIONER BERNTHAL: That's right.

COMMISSIONER CARR: If you don't have an off machine on a piece of radioactivity, then somebody ought to be looking after it.

MR. AUSTIN: They are a little more complicated to operate than are the cobalt-60 machines.

COMMISSIONER CARR: But when they're off, are they still hazardous?

COMMISSIONER BERNTHAL: No. Minimal.

COMMISSIONER CARR: And the cobalt-60 is. That's the big difference.

COMMISSIONER BERNTHAL: Yes.

CHAIRMAN ZECH: Can we proceed?

COMMISSIONER BERNTHAL: Let me ask one more question, John, and that is in respect to your estimate of the magnitude of the problem. While we all recognize that radon may be the

biggest problem of all now, we've only really recognized that for a year or two in this country. That doesn't mean that we can't do better in some other areas, as well.

I'm a little concerned about the estimate that -- I believe it's 1 percent of all misadministrations are indicated to be NARM misadministrations. Can you give us some sense of why you think that that statistic is reliable, when the only reports that we're likely to receive would be of a NARM isotope that might have been applied in error, when one of our regulated isotopes was supposed to have been applied, for example?

MR. AUSTIN: Yes. It is a backwards way of getting data. I think the regulation says that, if a patient is to receive NARM, but winds up receiving a byproduct, that is a misadministration of byproduct material. The inverse of that is not reportable.

COMMISSIONER BERNTHAL: Right.

MR. AUSTIN: The data are scanty on the misadministrations of NARM radiopharmaceuticals, because there's no federal agency that has the reporting requirements.

COMMISSIONER BERNTHAL: That's my point, yes.

MR. AUSTIN: One percent. It could be 5 percent. If you took in the inverse of that which is being reported, it might be 2 percent. But, even there, it's not clear how accurate all of the data are, even under our reporting system.

There's a judgment call on every one of the misadministrations.

When I took that data and translated it into a cost-benefit analysis, that suggested -- it was very imprecise -- but suggested that it would cost $10 billion per averted death, if we went after and were very, very successful in preventing misadministrations of NARM radiopharmaceuticals.

I thought that that number was so high that, even if I'm off by a factor of 100, it still did not appear cost-beneficial.

COMMISSIONER BERNTHAL: Well, if you're off by a factor of even 10, you would not be inconsistent with the standard that the EPA, for example, has frequently applied to the value of a human life. But that's a separate question.

MR. AUSTIN: Ten billion.

COMMISSIONER BERNTHAL: Ten billion, yes. I understand. And some of the regulations that our government has promulgated -- not in this agency, but in others -- have gone substantially above.

What is it we have, 10 million or something like that? Between a million and 10 million. I used to say a million, but now I've inflated it and I say 10 million. I'm not sure what's right any more.

But, let me ask one question, again, about the statistic. How many medical administrations, not misadministrations, how many medical radiopharmaceutical

administrations are NARM, as opposed to our stuff?

MR. AUSTIN: I could not find that number.

COMMISSIONER BERNTHAL: You see, that's an important number, too. Otherwise, the statistic is meaningless.

MR. AUSTIN: It is an important number. We did visit NIH, and I asked that question. Is it more likely to mix up radiopharmaceuticals that are byproduct than it is cyclotron-produced?

And the head of the department responded that he felt it was easier to mix up byproduct radiopharmaceuticals than cyclotrons, because they're coming from different places.

The byproduct is coming through shipments through the doors. Here's the box, and here they are. The cyclotron-produced radiopharmaceuticals, which generally had a short half life, minutes to hours, were handled differently in the pharmacy.

For example, you do not store a 10-minute half life radiopharmaceutical on the shelf for a couple of days and have it get mixed up with something else. He thought. It was his gut feeling that's how it would be.

COMMISSIONER BERNTHAL: Again, it's pretty hazy stuff, because I can assure you I used to order a lot of radiopharmaceutical materials, and, believe me, most of the carrier-free stuff came in a box through the door, and it was cyclotron-produced.

MR. DORNSIFE: Mr. Bernthal, if it helps any, in Pennsylvania we are not an agreement state, but we do license and inspect NARM. We have about 1,000 NRC licenses for byproduct material, and about 300 NARM licenses. Only about 6 or so of those are NARM-only licenses.

COMMISSIONER BERNTHAL: Maybe we can get better numbers on that. I have more questions, but I think I'm going to defer and give my colleagues a crack at some of this, I think, for a while.

CHAIRMAN ZECH: Commissioner Carr?

COMMISSIONER CARR: Yes, I've got a question for the staff, and perhaps Mr. Young. What would you expect as the product from CIRRPC, and when would you expect it?

MR. AUSTIN: If I could address the product. I think one thing that needs to be done early on is to get a better feel for what the problem is with NARM.

Some reported problems with NARM involve a truck running over a radium source that did not crack. Therefore, no contamination, no dose to anyone. You don't create a federal program for that situation.

So, I think there needs to be a better search for problems with NARM, problems of the kind that would get congressional interest in some legislation.

Given a good feel for what the actual problem is with NARM, then I think CIRRPC could look to see which agencies

correctly have jurisdiction over that particular problem, and ask the agency to integrate it into its over-all programs.

And, if it turns out there is a significant problem not being addressed at the federal level because of a gap in mandates to the various agencies, then CIRRPC could recommend that an appropriate agency go and seek that legislative authority.

That would be the product I would hope for. The schedule perhaps Dr. Young would like to address.

MR. STELLO: Well, maybe I would add another dimension to it. I would expect, and if it were to come to pass, that the NRC were to seek legislation to regulate some of this, whatever that is, that's one of the answers we'll get back.

Regulate what? Would that be a parallel set of requirements that would come out to give us authority that EPA now has and take it away from them? There are major policy questions.

COMMISSIONER CARR: Well, your in-going position is that we don't even know if there's a problem, so you want them to define the problem. And, then, if there is a problem, to find the extent of the problem and come back with a proposed solution.

MR. AUSTIN: Commissioner, from my review over a 3-month period in search of the problem, I didn't see a problem

that rose to the level that it ought to be the next target of congressional action.

The Conference here today says they, out there, see a problem. I could have tried to pursue more and more of what the problem is, but then, when I read the legislative history that says Congress has historically turned its head away from NRC on this issue of NARM --

COMMISSIONER BERNTHAL: Have we ever tried very hard to get the Congress to at least address just the one small corner of the problem that one of our state representatives mentioned?

MR. AUSTIN: Commissioner Bernthal, there was one case, but the history goes back farther. In the late '30s and through the '40s, cyclotrons were in extensive use in medical institutions and in universities.

In fact, they were the preferred source of radionuclides, because the byproduct material coming out of the weapons program would not give you the isotope you asked for. It would give you 5. So, they were contaminated.

COMMISSIONER BERNTHAL: It's still true, to some extent.

MR. AUSTIN: So, the cyclotron business was alive and well. Radium was known to be killing people.

In 1959, when Congress established the Agreement State Program, the Joint Committee wrote that the Committee has

rewritten this legislation to make sure that the AEC jurisdiction does not go into areas such as radium or other sources of ionizing radiation, because that is the responsibility of the states and other federal agencies.

So, it was explicit in '59. It came up in our Low-level Waste Amendments Act of 1985, where the Commission asked the Congress to include NARM in a definition of low-level waste. And it didn't survive, for the reason, I think, there was some confusion over what is NARM.

Are we talking about one-fifth the State of Florida's tailings from the phosphate industry? Or, where do you draw the line? And everyone just went --

COMMISSIONER BERNTHAL: It sounds like we never gave them a good recommendation.

COMMISSIONER CARR: The fact remains that we haven't submitted any legislation request.

MR. AUSTIN: No.

COMMISSIONER BERNTHAL: I certainly never have had the sense that they are hostile or unresponsive. I just don't think they've been given much to respond to up to now.

CHAIRMAN ZECH: Mr. Carr?

COMMISSIONER CARR: You owe me an answer there on timeframe, and what you expect the product to be.

MR. AUSTIN: Yes, Commissioner Carr. I would have to insist that the task that you want us to be about be as

specific as it can possibly be. Without a specific task, the timing is very unsure.

But, clearly, one of the things that we can do is bring the agencies together and ask: what are they doing, how well are they communicating, what are their plans. And that's what we've been doing on a number of issues, and that can be done effectively.

Typically, an issue comes before us, and we set a time limit of a year to get out and try to do something about that issue. Now, we haven't always made it in a year. We've slid in some cases to two years. But that's the kind of timeframe that we aim for.

You have too many job changes in the Federal Government always occurring. So, you don't want to have an issue too long in front of a policy body. You may have to go through 2 or 3 different policy bodies.

But that's what we're trying to do. We tried to set a time limit on this thing of a year, and that's our goal. Now, we haven't always made it, but in some cases we have.

I would say -- and I recognize we're going through a transition here very shortly and there will be some policy changes, policy membership, individuals, that we can expect to see changes through this next year.

COMMISSIONER BERNTHAL: That's for sure.

COMMISSIONER CARR: Well, my other question, I guess,

is for Mr. Strong. You implied that we could do something without legislation. Have you got a few concrete suggestions?

MR. STRONG: I don't pretend to be your attorney.

COMMISSIONER CARR: Well, we've got one down there that will help.

MR. STRONG: Right. He'll straighten me out. I think you could grandfather in some existing programs. You could do some things in the Agreement State Programs that exist now.

You could phase in a program of your own, perhaps, without costing you extensive manpower and resources. You could phase it in slowly. You could phase it in fast.

COMMISSIONER CARR: I'm concerned about do we have the authority to do that.

MR. STRONG: Well, I'm not the attorney, but I think that, where there is a vacuum, something needs to be done. I think that Congress didn't say in the statutes that you couldn't do it. Maybe in the history they said that.

I don't know. Chuck, are there other things?

MR. DORNSIFE: Well, maybe I can add one thing that may indeed happen. When EPA was responsive to the states in regulating disposal of NARM under their upcoming low-level waste standards, they looked at TSCA to do that.

And under TSCA they felt that they could not only regulate disposal, but also use. And they probably would have

also delegated the responsibility for regulating the use to NRC as part of their standards.

And, as you are aware, EPA generally-applicable standards are applicable to everybody.

MR. AUSTIN: Commissioner Carr, the staff, including the lawyers, are interacting with EPA on the extent to which everyone is in agreement as to what TSCA says they can do to us, if we don't already have authority. And that's still being worked out.

On the other, what we could do, absent legislation, to assist the disposal of discrete radium sources, this agency could identify a range of concentrations of radium that we deem to be suitable and those which we deem to be not suitable for our sites. And then say, if the state doesn't mind, if EPA doesn't mind, we don't mind.

But we would not be able to say radium in that concentration must go there. We can say we have no objection.

COMMISSIONER CARR: That takes care of waste disposal.

MR. AUSTIN: Yes. But if we had --

COMMISSIONER CARR: That's one part of the problem.

MR. AUSTIN: That's one part of it. EPA can do the regulation of the water purification plant under TSCA because of the radium loading on the resins.

They can require manifests to be generated. They can

watch that truck go all the way to the low-level waste site. And then we just watch them move it in.

MR. DORNSIFE: If I could maybe offer another perspective. I think, if EPA standards really do say that this discrete NARM has to be disposed of and the facility licensed under the Atomic Energy Act, then I think it's incumbent upon NRC staff to determine, indeed, what concentrations are acceptable for near-surface disposal. That's not something they're going -- If the good guys are going to do it, they have to do it.

COMMISSIONER CARR: Can they stick something under the Atomic Energy Act that's not already there?

MR. PARLER: Maybe, Mr. Chairman, I should comment.

CHAIRMAN ZECH: Please. Go ahead.

MR. PARLER: My answer would be no. And I would hope that would be the answer of any of those that will be my successors until the Congress acts. The Congress, since 1946, has limited the jurisdiction of this agency and its predecessor to those materials and facilities which are spelled out and defined in Section 11 of the Atomic Energy Act.

Basically, as far as the materials are concerned, they are byproduct materials that have been produced by the fission process. That's basically the kind of things that you are talking about here this morning.

The only exception to that was in the Uranium Mill

Tailings Act of some years ago, where the definition of byproduct material was expanded to include some of the potential hazards from mill tailings. So, the Congress approached that problem very specifically, very sharply.

It is certainly not a part of my legal reasoning to approach a problem like this to say, simply because the agency is not prohibited from doing something, that it can step in and do something, even though there might otherwise be a vacuum.

Our authority -- and this is not just my position -- but everybody that has been involved in this from the beginning have taken the position that our regulatory authority is specifically as laid out in the Atomic Energy Act of 1954 as amended.

In the Kerr-McGee Sequoyah problem that has been mentioned here, we have also taken the position that, if a nonradiological hazard is produced as a part of something that we regulate, then perhaps our jurisdiction could be expanded to cover that.

And also in areas, such as that where it might appear to others that might otherwise have jurisdiction that this agency was taking care of the problem, we should clear the air as much as possible.

But at least since I've been involved in the regulatory agency activity, there has been little doubt in the minds of either the lawyers or the policy-makers that this

agency and its predecessor do not have the authority to license, to regulate, or to do anything with regard to these kinds of materials that we're talking about here this morning, those that have the NARM label.

Now, cooperating, exchanging information, talking with EPA or FDA or whatever about approaches to problems, et cetera, we can do that.

My remarks are strictly limited to what this agency has the authority to do as a regulatory agency. And that authority is limited to those things that are defined in the Atomic Energy Act of 1954. That's my view.

CHAIRMAN ZECH: Thank you very much. Commissioner Carr, anything else? Commissioner Rogers?

MR. DORNSIFE: If I could just make one comment.

CHAIRMAN ZECH: Yes, go ahead.

MR. DORNSIFE: That being the case, as you are well aware, Part 20 has limits on the release of radium and other NARM isotopes. In addition, 10 CFR Part 61 talks about certain types of radium that can go to a low-level waste disposal facility.

So, I guess my question is, under what authority can NRC set release limits on those isotopes?

MR. AUSTIN: In my research I include a little discussion of that. In some cases, we adopted international standards. For example, in transportation. And, by adopting

it, we incorporated radium, because the international standard had radium in it.

On the Part 20 release limits on radium, I was unable to learn how we did that. As I said, it pops up everywhere.

CHAIRMAN ZECH: Perhaps we should look into that.

MR. PARLER: The answer to Part 20 would probably be for the same reason as the answer that you give. Part 20 historically followed in the wake of the international standards on radiation protection.

MR. AUSTIN: That, and possibly that where you have uranium you have radium. And, if you're releasing uranium, one would be releasing radium. It may be a combination of those two.

CHAIRMAN ZECH: Commissioner Rogers?

COMMISSIONER ROGERS: Yes. On this question of referring the issue of NARM to CIRRPC, your recommendation reads: For the purposes of developing an integrated policy in agency assignments on NARM, in particular, and ionizing radiation in general, in those situations where agency jurisdictions overlap --

It looks as if that's a very limiting kind of view that you're asking CIRRPC to take. It's just to sort out those situations where there's an overlap.

Is that really what we're considering here in the way of a recommendation?

MR. AUSTIN: Well, it may have evolved into two thoughts in one recommendation: integrating NARM into other federal agencies, and to integrate those federal agencies' activities, where there is joint jurisdiction.

One of the concerns that I developed in the course of researching what are the problems is that you were faced with this situation where the physician on a cobalt-60 device can severely overdose a patient. This agency could issue an order barring that physician from ever using the cobalt-60 machine again.

That same physician could walk down the hallway, get on a linear accelerator that does the same thing as the cobalt-60, and severely overdose patient after patient after patient. And there is no federal requirement to report that to any agency. And that just didn't make sense.

I can give you many examples. But in many respects, we regulate the nuclear medicine institutions in fundamentally different ways than does the Department of Health and Human Services, even when we are talking about the same risk, the risk of cancer from ionizing radiation. And it just didn't seem to make sense that you would have such different programs.

MR. STELLO: I think that the issue of broadening the subject to include ionizing radiation in general will get us to the point where you get hopeless. We're not going to get anywhere.

I concluded that we ought not to even raise that issue, but just stay with NARM. We ought to work out specifically the kind of a charter we want to send over to CIRRPC so it's clear to them and clear to us. I don't think we have done that yet, and we need to.

But I clearly have concluded that with the whole idea of raising up the general subject of ionizing radiation, we're not going to get anywhere. We have got to get it sharpened and to get beyond NARM. I think we're getting hopeless.

So, I think what we need to do is work that out with Dr. Young, and sit down and sharpen up this recommendation. We haven't done that yet. We need to do that.

COMMISSIONER ROGERS: I think that's a very important point to come out here, because the recommendation says ionizing radiation.

MR. STELLO: And I've concluded since then that I think it is just too broad a subject to raise. It's just too much to take on in one task, and I don't think we can get there. So, we want to sharpen it up.

Mr. Young has already made that point, and I concur completely. It is to sharpen it precisely what it is we would like them to look at, and we need to work that out, and we haven't.

COMMISSIONER ROGERS: The other question relates to this statement that I think I heard you make, Mr. Strong, that

inspection and enforcement is a problem at the states' level right now with NARM situations. The question is how would we be dealing with that in any way.

I take it that this included the agreement states that we already have agreements with. So that, this referral of this problem to CIRRPC wouldn't deal with that at all, as far as I can see. Because we're talking about just the federal agency jurisdictions, and their study and recommendations would not deal with anything at the state level.

MR. STRONG: That's right.

COMMISSIONER ROGERS: So, that's a separate issue that doesn't look as if it's being addressed here.

MR. STRONG: I think what we're saying is that it would be appropriate for the NRC to have a series of guidelines and evaluation criteria of state programs for discrete sources of NARM in the same way that it has a series of guidelines and evaluation criteria for the other radioactive materials that we license as agreement states. It would be the same kind of oversight.

COMMISSIONER ROGERS: Well, in that connection then, I have a question for Dr. Young. How do you see your committee's activities as they relate to things that go on in the states in this way? Do you just take, you know -- is that a blind side of your view?

MR. YOUNG: Clearly, our charge is to look at the

federal role.

COMMISSIONER ROGERS: I understand.

MR. YOUNG: But in this case, as we did with radon, I know we would extend an invitation for the states to come in and work with us. I think that's how we would get the broader view.

CHAIRMAN ZECH: Let me just ask to the Conference of Radiation Control Program Directors and the representatives with us today and representing the states. You heard the staff recommendation that we go to CIRRPC, and you've said you disagree with it. Have you -- why do you disagree with it really? In other words, to me, it looks like we have a national problem. Certainly, we federal officials responsible in the area of nuclear materials and byproduct materials, have a great interest in this. And we want to do what we can to help within our statutory boundaries.

And it looks like it needs to be coordinated. There's no question about it. It's a national problem, it looks to me like. It's come to the attention -- although it's an old problem, it's only recently become more focused. Certainly somebody has to take charge. I think that's what we're talking about. Somebody has to take charge. I think that's what you're saying too, and that's what we're all saying, I believe.

I would certainly agree with that. But I guess my

question really is to the Conference representatives. You're asking NRC to involve ourselves, and I think you can recognize our interest, our concern, our desire to assist where we can, again within our statutory authority. We could provide assistance and guidance, and we'll continue to do that. We want to work with you. We want to help you solve the problem, but you can see a little bit, I think, the problem we have here in this agency.

And then you hear recommendations from our staff that it be forwarded to the Federal Government. It seems to me that that's a sensible way to go, because if it's a national problem, it ought to be that way. It seems to me that you should be able to work out with the Federal Government representative, the CIRRPC representative, Dr. Young and his people, that you'd want to be involved in solving this problem.

So I guess my question is, why you feel that -- why do you resist that, or do you resist it?

MR. STRONG: Let me try to answer, and I think Mr. Hardin has a comment that might pertain, too.

We think you are the logical agency. You have the structure.

CHAIRMAN ZECH: Why then, if they result in that as a conclusion, a recommendation to us, and then give us the resources, go to Congress, get legislation -- that then certainly we would carry out the law.

MR. STRONG: Sure, but more important, is that -- or perhaps more important, is that we come here today and we get something started. It's more important that some federal agency, that somebody take charge, than maybe it is that the NRC be the agency.

CHAIRMAN ZECH: Well, that's how I feel too. And whether it be us or somebody, somebody should take charge. That's the prime point. And we have that same interest.

MR. STRONG: If it becomes the consensus that it ought to go to CIRRPC, and the states become participants in that solving exercise, and that's as far as we can get, that's the best we can do; obviously you're not going to launch your regulatory program tomorrow in response to our request today. And we'll take everything we can get, and that's --

CHAIRMAN ZECH: Well, that's important I think, to recognize that we really do have the same goal, and that is to solve this problem.

MR. STRONG: Yes.

MR. YOUNG: Mr. Commissioner, as you and I both know, committees never take charge of anything. What I'm implying, is that if in fact, NRC sends the request to us, our response is going to be back to NRC. We're saying that the issue has been raised by you. You are the agency that has focused the issue, and from our perspective, you're the one in charge. What we're going to do is, we're going to come back and give

you a series of recommendations that we think will help resolve that particular issue.

CHAIRMAN ZECH: That's what we need.

MR. YOUNG: So, from my perspective, the committee will not be in charge. We're just going to try help resolve a problem, but we're going to turn back to you with the final report.

CHAIRMAN ZECH: That's fine. But the point is, the problem should be looked at, at least in my judgement, from a federal level -- the national level, if you will, with participation from the states. And they should be heard out. And their concerns should be part of your conclusions and recommendations. And if you recommend, for example, that -- you know, you just can't give the problem back to us, and make it go away.

MR. YOUNG: Exactly.

CHAIRMAN ZECH: It looks like if you give it back to us, you're going to have to recommend legislation be proposed -- something like that, in order for us to be involved it, if that's what you think should be. Or you may conclude that EPA should take charge, or something. But in any case, you're going to have to give us some kind of recommendations that will solve the problem, rather than just keep talking about it, like has gone on for so long.

MR. YOUNG: One of the strong factors that we have

for us going, is that the agencies that are key in funding, sit on CIRRPC. So when we take a look at what it's going to take to solve that problem, there's a budgetary component. And when OMB signs off on that recommendation, in a way what you've got, is you've got their recognition that that is in fact, a budgetary issue.

We may not say how big those dollars may be, to solve a particular problem, but the mechanism we have of going after we've come to a conclusion of bringing that through a consensus-building process with those agencies; that's what makes it a very powerful document. Because then you've got a document that you can present in front, for Presidential consideration of our budget development, and in front of the Congress for policy consideration.

CHAIRMAN ZECH: Well, I think we should keep in mind --

MR. YOUNG: But we would work back through you to do that.

CHAIRMAN ZECH: That's fine. What we should keep in mind is what we're trying to do though, which is to get somebody to take charge of a national problem.

MR. YOUNG: Yes.

CHAIRMAN ZECH: And we want to help do that.

MR. YOUNG: Sure.

CHAIRMAN ZECH: Let me just before we wind up here

shortly, but I would like to, John Austin, compliment you on the fine job you've done too, as my colleagues have done. I think it's an excellent piece of work, and I think that you as well as the state people who are here with us today, and Dr. Young, all of you should be congratulated on putting forth a very professional product.

Was there a comment over here?

MR. HARDIN: Yes, I have one over here. I was trying to help in the answer to your question -- why do we disagree with the report? The bottom line is that out there in this world there is radioactive material called NARM being used in the exact same fashion as byproduct material.

One of the most serious comments made by one of our representatives during my survey was, that they were in a meeting in which a major manufacturer of both byproduct and NARM and made the following scatement: because the NRC's so tightly regulates us in the manufacture of byproduct material, we're very strong with that manufacturer, but we don't put as much attention to NARM.

I think our interest is, that the public deserves, when radioactive material is sitting here being used identically the same way, that it should be regulated the same way. And we feel, the states feel, that you have the mechanism set up to do it. We know NRC has a good, strong regulatory program, and I suppose where we disagree is; regardless of what

would come out of CIRRPC -- maybe still the states feel you guys are the ones that have got the expertise, and ought to be doing it.

CHAIRMAN ZECH: Sure, well we appreciate those comments, and I think we appreciate the confidence you're showing in the NRC, to be involved in something like this. You also heard the general counsel's comments, telling us we have a boundary, a statutory boundary that we must stay within. And therefore, it looks perhaps like if we would get designated to take charge, that we would need to have some kind of legislative relief to do so.

I think having said all that though, we're looking for someone to take charge. This Commission does care. That's why we're here today. We want to assist, within the boundaries of our legal constraints, and we will continue to assist and help you in any way.

But I would really hope that, depending on what does come out of this, that you would continue to work with the federal organizations, as well as with the NRC and others to help us. We've got to remember, it's a national problem. We're all American citizens, no matter where we are sitting, or what side of the table, or from which federal or state government; we're trying to solve something that involves our fellow citizens and their health, and it's a very serious issue.

So we should put aside as much bureaucracy as we can, in my judgment, and try to work together to come up with a mutually satisfactory solution.

COMMISSIONER BERNTHAL: I have one or two things. I don't want to prolong this, because I know we're all eager to get out of here. But, I want to try and answer, in part, the question the Chairman asked a minute ago, on behalf of the representatives from the states, if I may.

I think I understand what is troubling the states, because it troubles me a little bit, and I'm sure Al is acutely aware of the fact that, his body will go into some sort of unknown state, as of next November. He will begin losing people. And let's face it, there is a real question here of continuity on a matter that at this late stage, gets referred to CIRRPC. And Al, you're enough of a realist to understand that as well as I am.

And the thing therefore, that troubles me, and I think we all ought to be concerned about is, is the fact that 1979 -- that's 9 years ago now, almost to the day, the Commission issued a rather strong statement indicating its belief that this was a serious problem, referred it to the U.S. Radiation Policy Council, which proceeded to meet its demise before any action on NARM was ever taken.

That's what concerns me, and I would point out, however, that while the rest of you may dissolve into the

sunset, the Commission will go on even after I leave. So this body will still be here, and I would hope that this body might provide the forum for the continuity. So the concern is, do we have any assurance that we aren't going to do the same thing here that we did 9 years ago? I think that's the up-front question that certainly is a legitimate one.

I have one question which I don't want solicit an answer for right now at this late stage, but perhaps OGC could pick up on this. My understanding is that the NARM contribution to waste is perhaps one of the biggest problems here. EPA has a contemplated rule-making that I also understand may require that NARM waste be disposed of in NRC regulated facilities.

And the question for OGC then is, what sort of legal basis the NRC may have for imposing Part 61 requirements on those wastes, if we eventually have to dispose of them in our facilities.

MR. PARLER: I think the question's already been answered by one of the gentlemen -- asked or raised by one of the gentlemen at the table -- the gentleman from Pennsylvania.

COMMISSIONER BERNTHAL: I'm just asking for -- maybe you can do it off the top of your head, but --

MR. PARLER: I'm not going to answer something like off the top of my head. It requires thought. I will be delighted to undertake the issue, give the Commission a

memorandum, i.e. in writing. Generally speaking, however, I will say, consistent with what I have said earlier, if any other agency or department at the federal level or the state level, can tell this agency how to go about conducting it's regulatory program, I would think that that certainly is something that would have to be carefully thought out.

Particularly if outsiders could have, through some other device, such as the Toxic Substances Control Act or whatever, add to this agency's jurisdiction without this agency's say. That presents all sorts of problems. So that's why I would like to give the question careful attention, and I'll give you the response in writing, along with your colleagues.

COMMISSIONER BERNTHAL: Well, that's really all. I would just close with my comment here that -- or close my comments by pointing out again, that the people closest to the problem here are the states who seem to think there is a problem. It wouldn't be the first time the folks in Washington who are far away from any of these problems, may not perceive realities quite the same way that the states do, so I think we ought to listen to them very carefully.

And I would urge, too, that we avoid the global solution syndrome here. Sometimes attacking these specific identifiable trouble spots can be a lot easier and save a lot of time and be a good 95 percent solution. And I think again

our state representatives have pointed a few of those areas out. That's all. Thank you very much -- a very good briefing.

CHAIRMAN ZECH: Any other comments? Well, let me thank all of you for a very informative and very valuable briefing. We appreciate it very much. We stand adjourned.

[Whereupon, at 12:05 p.m., the briefing was concluded.]

CERTIFICATE OF TRANSCRIBER

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

TITLE OF MEETING: Briefing on Naturally-Occuring and Accelerator-Produced Radioactive Materials

PLACE OF MEETING: Washington, D.C.

DATE OF MEETING: Thursday, May 5, 1988

were transcribed by me. I further certify that said transcription is accurate and complete, to the best of my ability, and that the transcript is a true and accurate record of the foregoing events.

Suzanne D. Young

Ann Riley & Associates, Ltd.

SCHEDULING NOTES

TITLE: BRIEFING ON NATURALLY OCCURRING AND ACCELERATOR-PRODUCED RADIOACTIVE MATERIALS

SCHEDULED: 10:00 A.M., THURSDAY, MAY 5, 1988 (OPEN)

DURATION: APPROX 1-1/2 HRS

PARTICIPANTS:

NRC — 20 MINS

- ROBERT BERNERO, NMSS
- JOHN AUSTIN, PHD, NMSS

COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION (CIRRPC) — 10 MINS

- A.L. YOUNG, PHD, CHAIRMAN, CIRRPC

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS (CRCPD) — 20 MINS

- T.R. STRONG, CHAIRMAN OF CRCPD AND DIRECTOR OF THE OFFICE OF RADIATION PROTECTION STATE OF WASHINGTON
- CHARLES M. HARDIN, EXECUTIVE SECRETARY OF CRCPD
- WILLIAM P. DORNSIFE
  CHAIRMAN OF CRCPD AD HOC GROUP ON NARM AND
  CHIEF OF DIVISION OF NUCLEAR SAFETY
  BUREAU OF RADIATION PROTECTION
  COMMONWEALTH OF PENNSYLVANIA

NUREG-1310

Naturally Occurring and Accelerator-Produced Radioactive Materials - 1987 Review

Manuscript Completed: January 1988
Date Published: March 1988

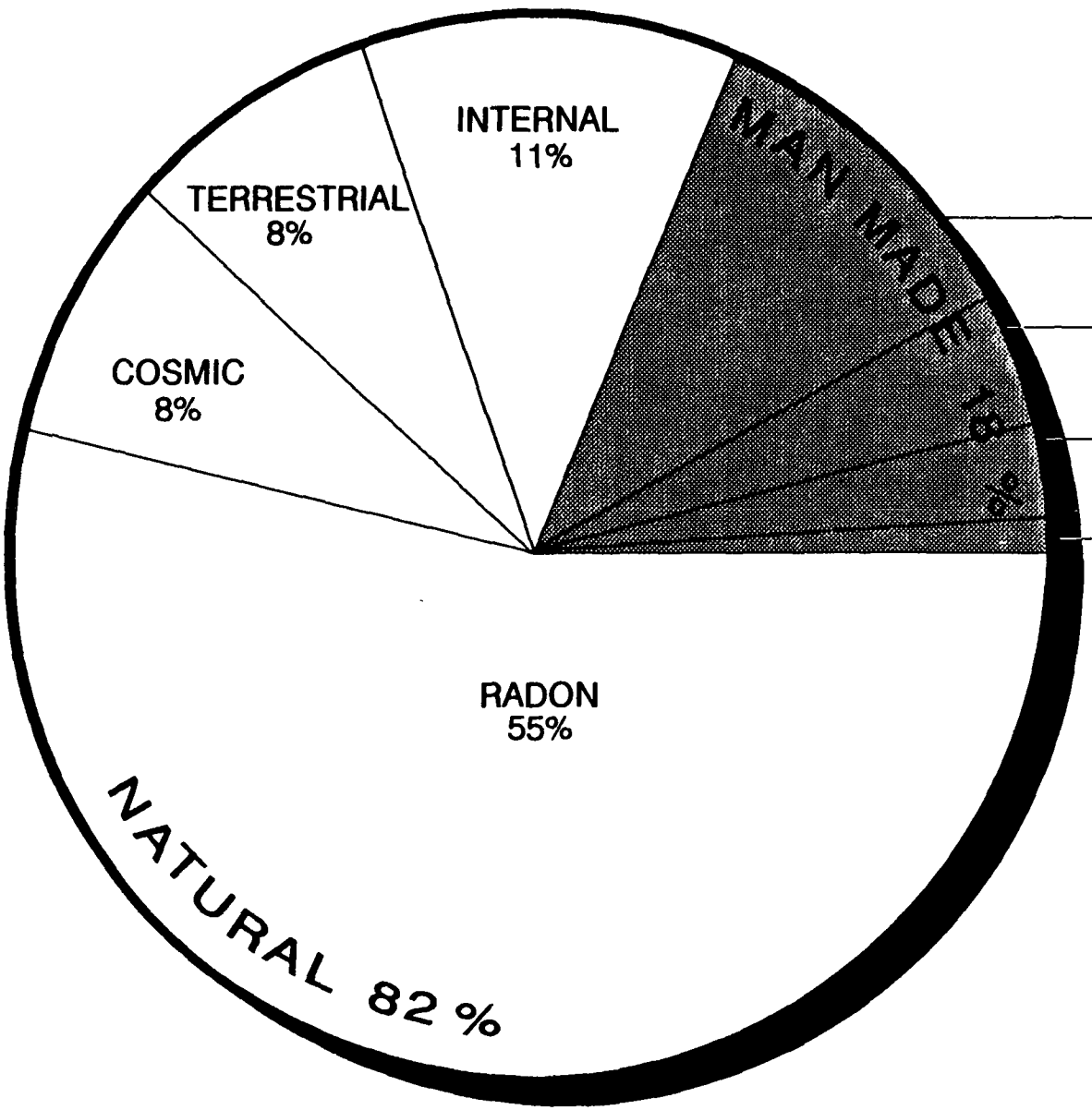
John H. Austin

Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

INTRODUCTION

- Definition of NARM
- Sources and uses of NARM
- Problems and Incidents with NARM
- Reviewed legislative history of some but not all Acts addressing radiation in general and NARM in particular

SOURCES OF RADIATION EXPOSURE



MEDICAL
X rays 11%

NUCLEAR
MEDICINE 4%

CONSUMER
PRODUCTS 3%

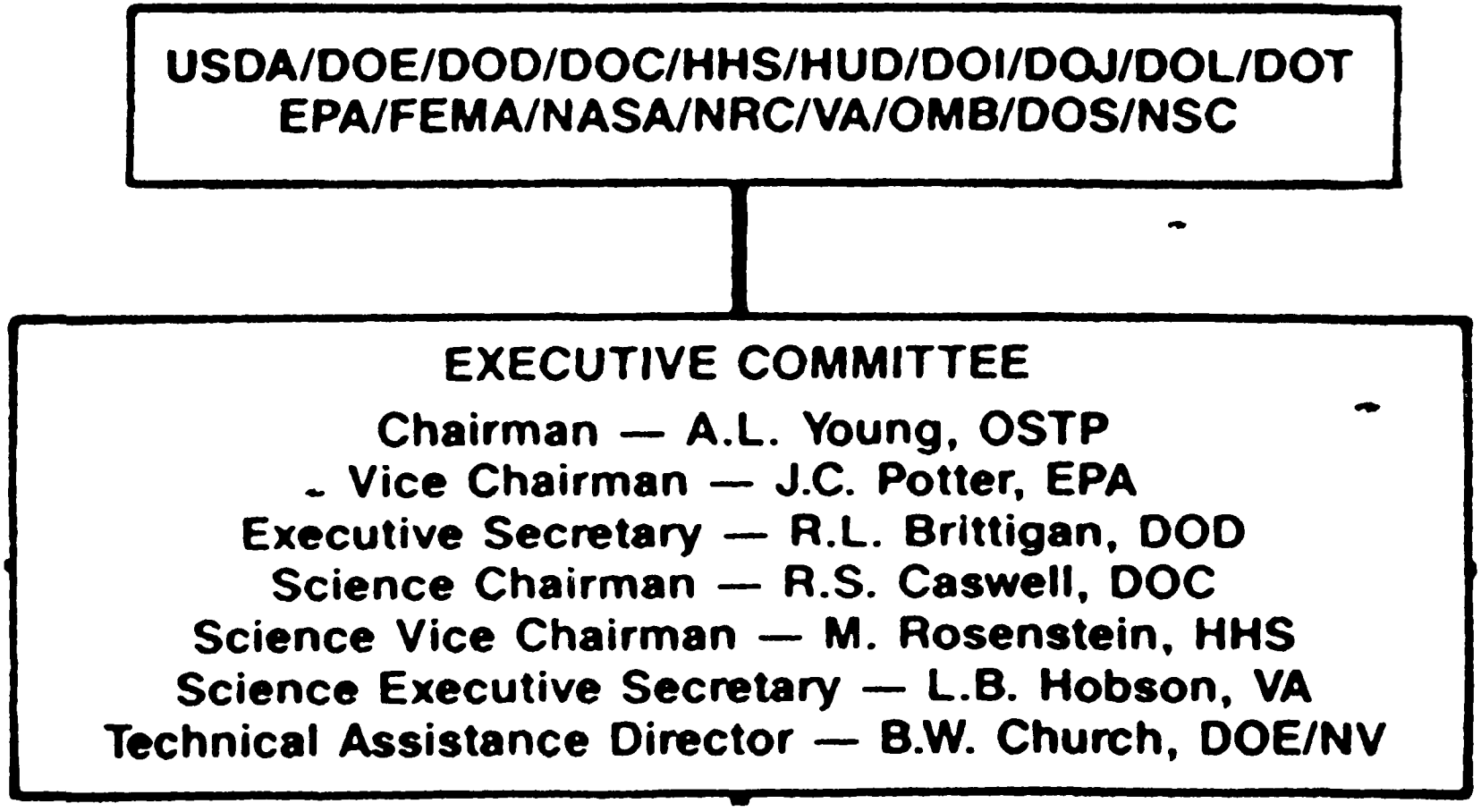
OTHER < 1%

Occupational	0.3%
Fallout	< 0.3%
Nuclear Fuel Cycle	0.1%
Miscellaneous	0.1%

THE FEDERAL GOVERNMENT AND NARM

- STATES HAVE PRIMARY RESPONSIBILITY
- NRC LINKED TO NEUTRON CHAIN REACTION
- REVIEWED OTHER FEDERAL AGENCIES MANDATES
- NARM IN THE ENVIRONMENT - EPA
- NARM IN THE HOMES - EPA, HUD, HHS
- NARM IN CONSUMER PRODUCTS - CPSC
- NARM IN WORKPLACE - DOL
- NARM IN MEDICAL INSTITUTIONS - HHS
- DEPARTMENTS OF ARGRICULTURE, COMMERCE, ENERGY, THE INTERIOR, STATE AND TRANSPORTATION
- CIRRPC

COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION (CIRRPC)



THE STATES AND NARM

- In 1977, CRCPD published suggested State Regulations for controlling NARM
- In 1987 the 29 A/S had licensing programs
  - 4 non-A/S had licensing programs
  - 2 non-A/S had voluntary or partial licensing
  - 14 non-A/S had registration
  - 1 non-A/S had no program
- Increasing State activity

THE ISSUES REGARDING NRC AND NARM

- IS THERE A NATIONAL PROBLEM?
- ARE THERE INTEGRATED CONTROLS?
- WOULD NRC REGULATION OVERLAP OTHER AGENCIES?
- ARE STATE CONTROLS ADEQUATE?
- IS NARM A FEDERAL, STATE OR PROFESSIONAL RESPONSIBILITY?
- HAS CONGRESS LOOKED TO NRC FOR NARM REGULATION?
- WHAT ARE RESOURCE IMPLICATIONS?
- WOULD NRC RESPONSIBILITY FOR NARM CHANGE THE NATURE OF NRC?

OPTIONS

- °STATUS QUO
- °SEEK AUTHORITY TO REGULATE NARM
- °SEEK AUTHORITY OVER RADIUM DISPOSAL
- °SEEK AUTHORITY OVER CYCLOTRON-PRODUCED RADIONUCLIDES FOR MEDICAL USE ONLY
- °REFER ISSUE TO COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION

RECOMMENDATIONS

- Refer the issue of NARM regulation to Committee on Interagency Radiation Research and Policy Coordination
- Inform Governors NRC has referred NARM regulation to CIRRPC

NUREG-1310

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Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
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INTRODUCTION

- °DEFINITION OF NARM
- °SOURCES AND USES OF NARM
- °PROBLEMS AND INCIDENTS WITH NARM
- °REVIEWED LEGISLATIVE HISTORY OF SOME BUT NOT ALL ACTS ADDRESSING RADIATION IN GENERAL AND NARM IN PARTICULAR

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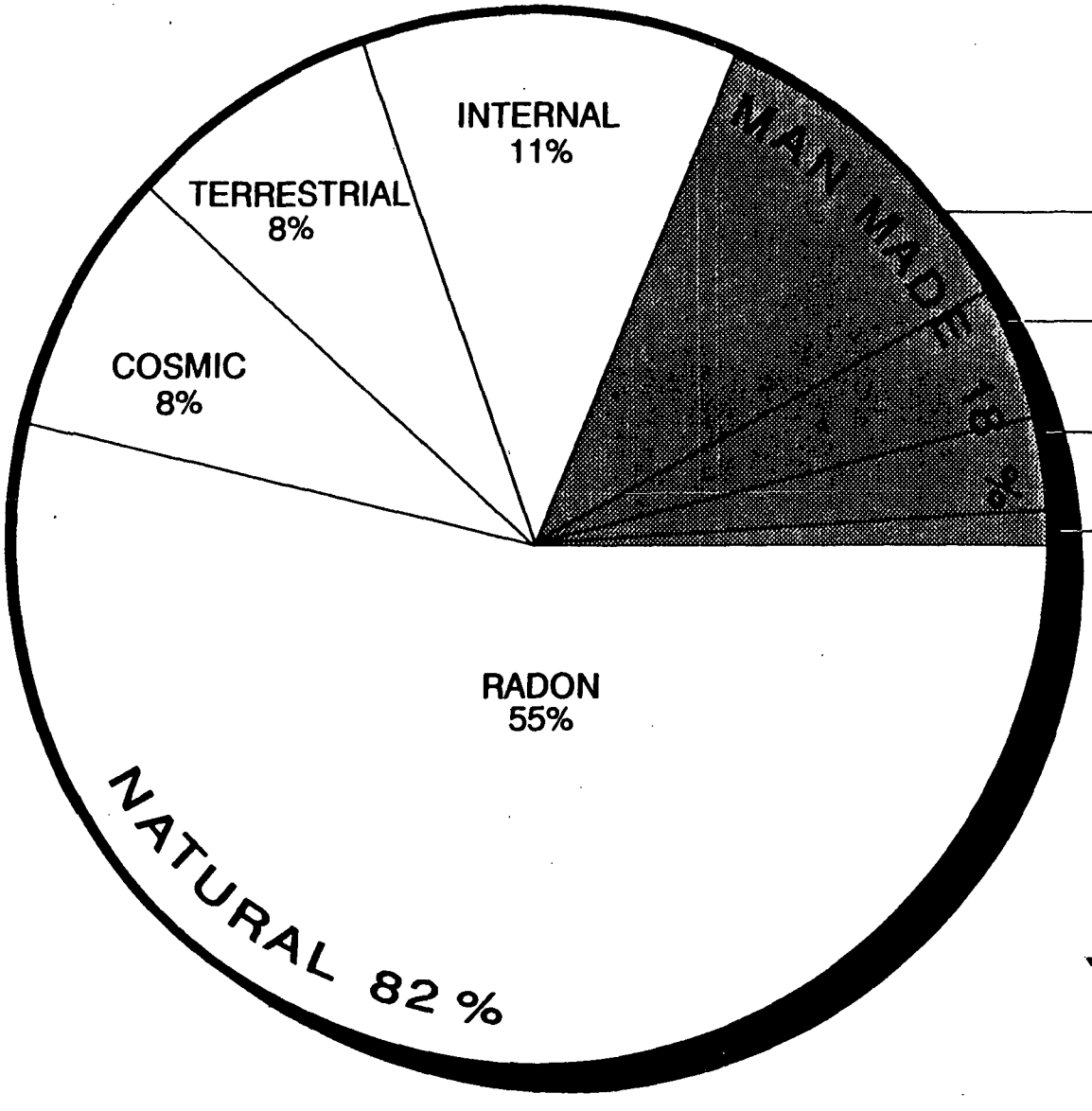

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- °REVIEWED OTHER FEDERAL AGENCIES MANDATES
- °NARM IN THE ENVIRONMENT - EPA
- °NARM IN THE HOMES - EPA, HUD, HHS
- °NARM IN CONSUMER PRODUCTS - CPSC
- °NARM IN WORKPLACE - DOL
- °NARM IN MEDICAL INSTITUTIONS - HHS
- °DEPARTMENTS OF ARGRICULTURE, COMMERCE, ENERGY, THE INTERIOR, STATE AND TRANSPORTATION
- °CIRRPC

I - 131 ⇒ Regulated

I - 123 ⇒ NARM ⇒ Cyclotron produced

replacing 131 for medical use

COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION (CIRRPC)

USDA/DOE/DOD/DOC/HHS/HUD/DOI/DOJ/DOL/DOT
EPA/FEMA/NASA/NRC/VA/OMB/DOS/NSC

Ross & Bernero

EXECUTIVE COMMITTEE

Chairman — A.L. Young, OSTP
Vice Chairman — J.C. Potter, EPA
Executive Secretary — R.L. Brittigan, DOD
Science Chairman — R.S. Caswell, DOC
Science Vice Chairman — M. Rosenstein, HHS
Science Executive Secretary — L.B. Hobson, VA
Technical Assistance Director — B.W. Church, DOE/NV

THE STATES AND NARM

- IN 1977, CRCPD PUBLISHED SUGGESTED STATE REGULATIONS FOR CONTROLLING NARM
- IN 1987 THE 29 A/S HAD LICENSING PROGRAMS
  - 4 NON-A/S HAD LICENSING PROGRAMS
  - 2 NON-A/S HAD VOLUNTARY OR PARTIAL LICENSING
  - 14 NON-A/S HAD REGISTRATION
  - 1 NON-A/S HAD NO PROGRAM — Montana
- INCREASING STATE ACTIVITY

THE ISSUES REGARDING NRC AND NARM

- IS THERE A NATIONAL PROBLEM?
- ARE THERE INTEGRATED CONTROLS? — NO
- WOULD NRC REGULATION OVERLAP OTHER AGENCIES? — YES
- ARE STATE CONTROLS ADEQUATE? — NOT INADEQUATE
- IS NARM A FEDERAL, STATE OR PROFESSIONAL RESPONSIBILITY? — CASE SPECIFIC
- HAS CONGRESS LOOKED TO NRC FOR NARM REGULATION? — NO
- WHAT ARE RESOURCE IMPLICATIONS? — ENORMOUS
- WOULD NRC RESPONSIBILITY FOR NARM CHANGE THE NATURE OF NRC? — YES
  - BREAK HISTORIC USE OF NEUTRON CHAIN
  - REGULATE CYCLOTRONS

OPTIONS

- STATUS QUO
- SEEK AUTHORITY TO REGULATE NARM
- SEEK AUTHORITY OVER RADIUM DISPOSAL
- SEEK AUTHORITY OVER CYCLOTRON-PRODUCED RADIONUCLIDES FOR MEDICAL USE ONLY
- REFER ISSUE TO COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION

RECOMMENDATIONS

- Refer the issue of NARM regulation to Committee on Interagency Radiation Research and Policy Coordination
- Inform Governors NRC has referred NARM regulation to CIRRPC

ORAU 87/J-78

CIRRPC
THIRD ANNUAL REPORT

June 30, 1987

Committee on Interagency Radiation Research and Policy Coordination

Alvin L. Young, Chairman

**Office of Science and Technology Policy,
Executive Office of the President
Washington, DC 20506**

COMMITTEE ON INTERAGENCY RADIATION RESEARCH AND POLICY COORDINATION

Third Annual Report
July 1, 1986 to June 30, 1987

I. INTRODUCTION

This is the third annual report of the Committee on Interagency Radiation Research and Policy Coordination (CIRRPC). CIRRPC was chartered April 9, 1984 under the Federal Coordinating Council for Science, Engineering and Technology (FCCSET) and reports to the Office of Science and Technology Policy (OSTP), Executive Office of the President. Its overall charge is to coordinate radiation matters between agencies, evaluate radiation research, and provide advice on the formulation of radiation policy.

Subcabinet and senior policy level representatives and senior scientists from member agencies constitute CIRRPC and its scientific component, designated as the Science Panel. There are 18 CIRRPC member agencies at this time, with 14 agencies having representatives on the Science Panel.

A listing of the Executive Committee members, agencies' representatives, science panel members and science and policy panel participants are contained in section IV.A. CIRRPC's reporting and organizational structure and Oak Ridge Associated Universities (ORAU) technical assistance staff is contained in section IV.B.

II. SUMMARY

During its third year CIRRPC issued two reports of national importance and addressed 12 issues, six of which will be discussed in reports scheduled for issuance within the first several months of its fourth year of operation.

The two reports issued during CIRRPC's third year are the report on the guidance for U.S. policy on use of the international system of units for radiation quantities and measurements, issued in December 1986, and the report identifying the radiation exposure issues associated with the exposure to radon naturally occurring in houses and buildings, issued in August 1986.

RADON

The report of the Science Panel on "Radon Protection and Health Effects," was developed by the Science Subpanel chaired by Dr. Aurel Goodwin of the Department of Labor (DOL), and recommended:

a. an accelerated research program to assess health risks from indoor radon exposures that would include: epidemiological studies of exposed populations, with consideration of smoking histories; testing of risk projection models using occupational exposure and health data; and basic studies of mechanisms involved in radiation-induced lung cancer, including better definition of cells at risk,

b. a federal consensus be obtained on remedial action levels for controlling indoor radon exposure, including development of design guides for new housing,

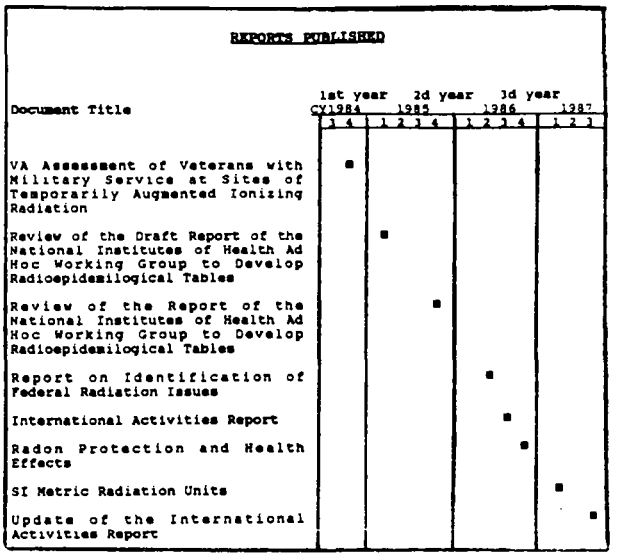
c. a Federal program should be initiated for development of predictive methods of potential radon hazards of building sites,

d. a national indoor radon survey needs to be conducted as soon as possible, and

e. assistance to state and local governments and to the building industry for applying remedial measures to existing structures and criteria for new building design and construction.

SI METRIC UNITS

The report of the Policy Subpanel on SI Metric Radiation Units, chaired by Dr. David Goldman of the Department of Energy (DOE), [formerly of the Department of Commerce, (DOC)], recognized that the use of the International System of Units (SI) for radiological quantities is increasing internationally, but is not currently accepted in the U.S. The recommendation of the report was that it be U.S. policy to use dual radiation units in federal activities.



LOOKING AHEAD

In the next several months, subpanels will submit draft reports on major radiation issues either to the Science Panel or the CIRRPC Policy Panel for review and approval. The subjects addressed by these subpanels are:

- Policy recommendations of the Subpanel on Indoor Radon [Mr. Raymond G. Kammer, National Bureau of Standards (NBS), Chairman];
- Application of the NIH Report on the Radioepidemiological Tables to veterans' compensation (Dr. J. W. Thiessen, DOE, Chairman);
- Review of the agricultural and ecological effects of nuclear war as postulated in the SCOPE 28 Report [Dr. William H. Tallent, Department of Agriculture (USDA), Chairman]; and
- The neutron quality factor [Mr. David Janes, Environmental Protection Agency (EPA), Chairman].

Several projects under the direction of the ORAU Technical Support Staff will also result in reports early in the next year of operation. These are:

- A report by the National Council on Radiation Protection and Measurements (NCRP) on the radiation exposure to the U.S. population;
- An overview of the Federal Government's radiation research agenda;
- A compendium of legal and technical facts contained in the major U.S. radiation standards and guides for protection of workers and the public.

In addition, CIRRPC has underway several studies either by subpanels or contract which will result in reports in the next year of operation or beyond. These are:

- The BEIR V report by the National Research Council (NRC) of the National Academy of Sciences (NAS) on the biological effects of low levels of ionizing radiation on populations;
- The development of a research program that will provide a basis for more precisely determining the biological effectiveness of neutron radiation [Dr. Bruce Wachholz, National Cancer Institute (NCI), Science Subpanel Chairman];
- A report addressing the question of advance planning of health effects research following a major nuclear accident (Mr. Charles M. Eisenhauer, NBS, Science Subpanel Chairman); and
- A report on the research needs in health effects of non-ionizing radiation [Dr. Ross Adey, Veterans Administration (VA), Chairman].

LEGISLATIVE MONITORING

Periodically the Executive Committee is briefed on the Congressional activities related to radiation matters which may be of interest to the member agencies. During the past year, legislative briefings pertained to the following topics:

Monitored Retrievable Storage
Extension of the Price-Anderson Act
Food Irradiation
Radiation Research Reorganization Act
Radon Health Effects
High Level Waste Repositories
Atomic Veterans
Nuclear Protections and Safety Act of 1987

BRIEFINGS AND MEETINGS

During the past year there were 70 meetings, including meetings of the CIRRPC members, the Executive Committee, the Science Panel and the Science and Policy Subpanels. In addition, there was a number of briefings, either presented by or attended by CIRRPC personnel. Among these were:

- A briefing on CIRRPC activities for Mr. Don Ofte, Deputy Director for Defense Programs, DOE; Ms. Mary Walker, Assistant Secretary for Environment, Safety and Health, DOE; and Mr. James Vaughn, Acting Assistant Secretary for Nuclear Energy, DOE, on July 16, 1986;
- A similar briefing for the then newly appointed Assistant Secretary for Nuclear Energy, DOE. Mr. David Rossin on August 16, 1986;
- A briefing on the SI Metric Unit Report for Dr. Bruce Merrifield, the Assistant Secretary for Productivity, Technology and Innovation, DOC, on December 8, 1986;
- A briefing for Dr. Delbert Bunch, Deputy Assistant Secretary for Safety, Health and Quality Assurance, DOE, on CIRRPC activities on January 16, 1987;
- A similar briefing for Dr. Robert Barker, Assistant to the Secretary of Defense for Atomic Energy, Department of Defense (DOD), on February 26, 1987, and
- A briefing of the White House Science Council on CIRRPC activities on March 19, 1987.

During the last quarter of the reporting year the Executive Committee began the second round of visits to the member agencies since CIRRPC's founding in May of 1984. Meetings with the Federal Emergency Management Agency (FEMA), NRC and EPA staffs concerning radiation matters were held in April and with Health and Human Services (HHS) in May 1987. Visits to the remainder of the agencies will be scheduled during the summer and fall of 1987. These meetings provide a valuable opportunity for informal exchanges of information on radiation issues of concern to the agencies and enable CIRRPC to more fully exercise its responsibility for coordination.

PERSONNEL CHANGES

In August 1986, Dr. Percival D. McCormack of the National Aeronautics and Space Administration (NASA) accepted the position of Executive Secretary of the Science Panel, replacing Dr. Lawrence B. Hobson, VA.

III. OPERATIONS

USE OF PROBABILITY OF CAUSATION METHODOLOGY IN RADIATION COMPENSATION

In February 1985, CIRRPC undertook an effort at the request of the VA to examine how the National Institutes of Health (NIH) Report on Radioepidemiological Tables might be used in adjudicating veterans' claims of radiation injury. Based on decisional criteria published by the VA, CIRRPC's Science Panel adopted as a statement of its task the following question:

"To what extent can the NIH Report be used credibly to assist in adjudicating a veteran's claim of radiation injury in a manner that satisfies the 'no reasonable possibility' and the 'at least as likely as not' criteria stated by the VA and that is consistent with the VA's 'reasonable doubt policy' acting in the claimant's favor?" To meet this objective, the Science Panel is preparing a listing of radiogenic cancers applicable to such claims and using the NIH probability of causation methodology to develop a screening procedure for selecting only those cases having some reasonable degree of merit for consideration. A report of its findings is expected to be published by CIRRPC in late 1987. A follow-up report is being developed by a CIRRPC subpanel that will address policy implications on various segments of society and Federal programs by the introduction of the probability of causation methodology into compensation decisions.

RADON

CIRRPC Science Panel Report—Radon Protection and Health Effects

In August 1986, the Science Panel Report was forwarded to Dr. Richard Johnson, Acting Director of the Office of Science and Technology Policy. The report noted that the recommended actions (see II. Summary) could be accomplished with continued cooperation and coordination among the Federal agencies, and noted that CIRRPC will continue to follow developments.

Policy Subpanel on Indoor Radon

As a follow up to the Science Panel's activities on indoor radon, a Policy Subpanel was formed in December 1986. The charges to the Subpanel were to review the recommendations of the Science Panel report, and to determine the extent to which they are being addressed by the various Federal agencies. The Subpanel was also asked to note those areas that were not being addressed, or areas where there were unnecessary duplications. The Subpanel was also to review recent additions to the Superfund Act,

and determine if additional work was indicated beyond those items identified in the Science Panel report. Mr. Ray Kammer, DOC, was selected as chairman for the Subpanel.

Since February 1987, monthly meetings have been held at which the various Federal programs have been considered against the recommendations of the Science Panel report and the requirements of the Superfund Amendments. A draft report is expected to be circulated for CIRRPC member agency review in August 1987.

RADIATION MEASUREMENTS, RECORDS, AND CONTROL

The Policy Subpanel on Metrication of Radiation Units completed a report in December 1986. The report was forwarded by Dr. Alvin L. Young to Dr. William R. Graham, the Science Advisor to the President, who in turn transmitted the report with its recommendation (see II. Summary) on the use of SI units to DOC, the Federal agency responsible for the Federal Government's programs on metrication. Dr. Graham requested that CIRRPC be advised of actions taken by the Federal agencies in response to the efforts of DOC.

NEUTRON QUALITY FACTOR IN RADIATION PROTECTION

The Science Subpanel on Scientific Basis for Radiation Protection Standards has been examining the issue of increasing the quality factor for neutrons by a factor of two for purposes of radiation protection. To assist in this evaluation a meeting of the Subpanel and other Science Panel members was held in October 1986 with a group of independent scientists with expertise in this area of interest. A summary of the meeting, including documents presented by the participants, has been completed and will be included in the Subpanel's final report on this issue. The findings of the Subpanel do not support a change in the quality factor at this time. This action is contrary to the interim recommendation of the International Commission on Radiological Protection (ICRP), but is consistent with the positions taken by most national governments.

HIGH-LET RADIATION

The charter of the Science Subpanel on High-LET Radiation was approved by the Science Panel on December 9, 1985. Responsibilities of this Subpanel include: maintaining an awareness of relevant review and assessment activities being carried out by national and international organizations addressing High-LET radiation research and/or protection issues; serving as an information focus and coordination point for Federal agencies with respect to High-LET research activities; identifying High-LET research needs; and reviewing proposed agency research agendas related to High-LET radiation, as requested by CIRRPC.

On July 2, 1986 CIRRPC received modification of an earlier request from DOE to review its proposed research plan to establish relative biological effectiveness (RBE) factors for neutrons. The modified request asked the Science Panel to develop a conceptual plan for research into neutron biological effectiveness and to explore alternative methods for coordinating this effort as an interagency/international research activity. In response to this request, the Subpanel drafted a charge for a task group and assembled a group of consultants, including representatives from the European community, to address this issue. Inclusion of the European scientific community in planning the research program was specifically requested by DOE because of the excellent research in this area being conducted by European investigators.

The first joint meeting of the Subpanel and task group was held June 18–19, 1987. The major portion of the meeting was spent discussing operational, regulatory, and research needs with those Federal agencies which have major responsibilities and programs that are impacted by the uncertainties in and lack of scientific data on the health effects of human exposure to neutrons. The report of the task group is expected in mid-1988.

NON-IONIZING RADIATION

The Science Subpanel on the Future Research Needs in Health Related Effects of Non-Ionizing Radiation reviewed the comments on the draft report received from the Science Panel members. On the basis of those comments, additional expertise has been added to the Subpanel in the area of epidemiological studies. Dr. Charlotte Silverman has agreed to serve in this capacity.

Members of the Subpanel met with Dr. Randall Caswell (NBS) and Dr. Marvin Rosenstein (HHS) to review the nature of the comments; it was agreed to have a consultant categorize the comments in order to determine how they may best be treated in the subsequent rewrite of the report.

PRE-DISASTER PLANNING FOR HUMAN HEALTH EFFECTS RESEARCH

An ad hoc group, appointed by the Science Panel, under the chairmanship of Dr. Frank Hassler, Department of Transportation (DOT), considered whether or not it was desirable to establish a formal Science Subpanel to address the issue of whether plans should be in place to gather information in the event of a nuclear accident. The purpose would be to salvage information on human health effects which might otherwise be lost.

As a result of the group's recommendations, a Science Subpanel was established, under the chairmanship of Mr. Charles Eisenhauer, DOC, to evaluate the desirability and feasibility of developing the capability to study human health effects of nuclear disasters.

The Subpanel was approved by Dr. Young on March 24, 1987. The charges to the Subpanel include determination of where gaps exist in our knowledge of human health effects of ionizing radiation, and where information might be collected that will help fill those gaps. The Subpanel has reviewed the scenarios and types of nuclear disasters which have been examined, and is reviewing the emergency procedures in place among the Federal agencies to determine the best mechanisms by which procedures could be modified to call for the collection of vital health information.

IONIZING RADIATION RISK ASSESSMENT

At the direction of the CIRRPC Executive Committee, the Science Panel developed, and subsequently approved, a work statement for a Subpanel on Ionizing Radiation Risk Assessment in response to the Department of Defense's request to assist in the development of a coordinated Federal position on risk assessment and, if appropriate, risk management. The work statement reflects extensive Science Panel discussion on the need for a Federal consensus on the use of analyses assembled by authoritative organizations. The initial action of the Subpanel will involve the upcoming report from the National Academy of Sciences/National Research Council (NAS/NRC), "The Effects on Populations of Internally Deposited Alpha-Emitting Radionuclides: 1987," also known as BEIR IV.

REVIEW OF SCOPE 28, VOLUME II

The Scientific Committee on Problems of the Environment (SCOPE), a part of the International Council of Scientific Unions (ICSU), released a two-volume report *The Environmental Consequences of Nuclear War*, in September 1985. Volume I of the report concentrated on physical and atmospheric effects, whereas Volume II examined ecological and agricultural effects. An "acute" phase involving drastic reduction in light and temperature lasting for days to weeks, and a "chronic" phase with slowly clearing skies and gradual recovery of warmth, lasting for a year or longer, are assumed in the SCOPE-28 analysis. The SCOPE-28 authors concluded that agricultural production would be so disrupted that many of the acute phase survivors would starve during the chronic phase.

The agricultural implications of the SCOPE-28 report were sufficiently serious that an independent evaluation of Volume II was deemed imperative. Accordingly, OSTP and CIRRPC asked USDA to form an ad hoc committee to conduct the review. The charge to the committee was to review Volume II, which is based on the scenario described in Volume I. That is, a 6000 megaton, 12,000 warhead exchange occurred, striking the targets described in

Volume I, with the amount of smoke and dust generated and lofted into the atmosphere consistent with the magnitude of the exchange. The major, but not exclusive, emphasis of the review is to be the evaluation of the models and assumptions used to calculate the effects on crop production under conditions of reduced temperature and solar radiation. This review is expected to be completed and published in late 1987.

COMPENDIUM OF RADIATION PROTECTION STANDARDS AND GUIDES

Tasked by CIRRPC, ORAU is preparing a compilation of major U.S. radiation protection standards and guides applicable to workers and the general public. Legal and technical facts on requirements are summarized for over twenty such standards based on their publication in the Federal Register. Included in the compendium are Federal Guides on Radiation Protection approved by Presidential signature and standards promulgated, or proposed, by the EPA, NRC, Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA) and the Food and Drug Administration (FDA). The report will include protection requirements and notation of other standards that are somewhat related to a given standard. The final ORAU report is expected to be submitted to CIRRPC in early 1988.

INTERNATIONAL ACTIVITIES

The report entitled "CIRRPC Member Agency Participation in International Radiation Activities," completed in June 1986, was updated in May 1987. The report contains the names of Federal agency personnel assigned liaison roles to international organizations.

Both the Science Panel and the Subpanel on Pre-Disaster Planning have been briefed by participants in international meetings related to post-Chernobyl studies on health effects. This information is specifically related to the assignment of the Pre-Disaster Subpanel in identifying areas where opportunities to gain knowledge might have been missed.

U.S. POPULATION RADIATION EXPOSURE ASSESSMENT

The CIRRPC-sponsored draft report of the NCRP Scientific Committee #48 entitled "Exposure of the Population in the United States to Ionizing Radiation" was received by ORAU on September 30, 1986, in accordance with ORAU's purchase order agreements. The report summarizes more detailed assessments of the major natural and man-made sources of exposure being prepared by various NCRP committees. Major source categories are: natural radioactivity, consumer products, nuclear fuel cycle, medical and dental sources, occupational sources, and miscellaneous environmental sources. The draft report was subsequently revised to incorporate comments received by NCRP during reviews by both CIRRPC and NCRP members. The final report is expected to be available by fall 1987.

BEIR V REPORT

The contract between ORAU and the NAS/NRC for BEIR V, an update of the comprehensive BEIR III report on the somatic and genetic risks to populations due to low levels of ionizing radiation, became effective July 1, 1986.

When completed, the BEIR V report will include among its new findings those following reassessment of the dosimetry for the survivors of the atomic weapons detonated during World War II and a summary of findings in the BEIR IV report on the effects of internally deposited alpha-emitting radionuclides. The findings reported are expected to be in a form suitable for use in making health risk assessments, assigning share values for radiation as a causative disease agent, and formulating radiation exposure control decisions. Like previous BEIR reports, it is expected that the BEIR V report will be both an important scientific document used in developing U.S. policy on radiation protection and a much referenced social document used, for example, in the U.S. court system.

The NAS/NRC held a public meeting on the project in March 1987 to obtain scientific information and advice. The Committee of NAS, established to

prepare the BEIR V Report, has met quarterly to discuss the outline and content of the report, to identify new animal and human data bases, and to discuss new concepts in radiobiology since the 1980 BEIR III report. The final report is expected at the end of 1988.

FEDERAL RADIATION RESEARCH AGENDA

The recommendations of the Ad Hoc Subpanel on How To Address the Radiation Research Agenda were adopted by the Science Panel at its September 16, 1985 meeting. These recommendations were: 1) be alert to agency reviews and act on agency requests concerning research agendas; 2) act on agency requests to critique specific radiation research proposals; and 3) prepare periodic summaries of Federal radiation research. In response to the third recommendation, the Science Panel directed preparation of an overview of radiation research on a comparative FY 1981 and FY 1985 basis. The FY 1981 data and the research categories were extracted from the November 1982 draft report of the Interagency Radiation Research Committee's Subcommittee on Radiation Research Strategy Implementation, which will be published as an appendix to the CIRRPC report. The FY 1985 data from all the Federal agencies have been categorized according to the needs identified in the Strategy Report and reviewed for completeness of the data base. A final report is scheduled for early 1988.

IV. A.

CIRRPC MEMBER AGENCIES AND REPRESENTATIVES
Policy and Science Subpanel Participants
ORAU Technical Assistance Staff

Executive Committee

Chairman
Dr. Alvin L. Young
Office of Science and Technology Policy
Executive Office of the President

Vice Chairman
Mr. J. Craig Potter
Environmental Protection Agency

Executive Secretary
Mr. Robert L. Brittigan
Department of Defense

Chairman, Science Panel
Dr. Randall S. Caswell
Department of Commerce

Vice Chairman, Science Panel
Dr. Marvin Rosenstein
Department of Health & Human Services

Executive Secretary, Science Panel
Dr. Percival D. McCormack
National Aeronautics & Space Administration

Technical Assistance Director
Mr. Bruce W. Church
Department of Energy
Nevada Operations Office

Italics Denote Science Panel Members

Member Agency Representatives

Department of Agriculture
Dr. Mary E. Carter
Dr. James W. Glosser, alt.
Dr. Jane F. Robens
Dr. Ronald Engel, alt.

Department of Commerce
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Mr. David E. Janes, EPA
Dr. Elliot Postow, DOD
Dr. Moris L. Shore, HHS
Dr. Charlotte Silverman, HHS
Ms. Janet Healer, DOC

Science Subpanel on Pre-Disaster Planning For Human Health Effects Research
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Dr. Thomas MacVittie, DOD
Dr. Robert Young, DOD
Dr. Robert Goldsmith, DOE
Mr. Robert Wilkerson, FEMA
Mr. Harold T. Peterson, NRC
Dr. Daniel Weiss

Science Subpanel on Scientific Basis for Radiation Protection Standards
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Mr. Robert E. Alexander, NRC
Mr. Elmer H. Eisenhower, DOC
Dr. Robert G. Thomas, DOE
CPT David George, DOD
Mr. Kenneth L. Groves, Los Alamos National Laboratories

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Mr. Robert E. Alexander, NRC
Dr. Lawrence S. Myers, Jr., DOD
Dr. Bruce W. Wachholz, HHS
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Dr. J. Joseph Coyne, DOC
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Mr. Wayne M. Lowder, DOE
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Mr. Allan B. Tanner, DOI
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Mr. Richard Staufenberger, DOL
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Mr. Robert W. Poe, DOE
Mr. Richard Rawl, DOT
Mr. Wendell Carriker,DOT
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Resources for the Future

Dr. Elise Rose

Dr. Gerritt Hoogenboom
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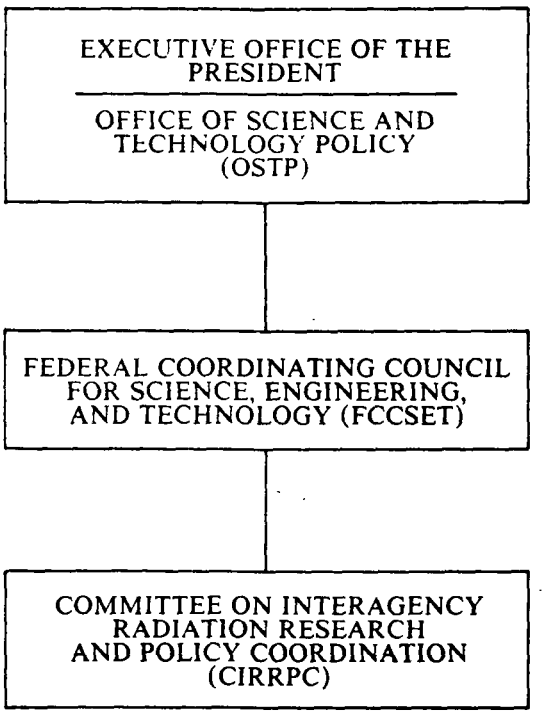
IV. Organization and Reporting Structures

B. CIRRPC Organization



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CIRRPC

REPORT ON IDENTIFICATION OF FEDERAL RADIATION ISSUES

TO THE FEDERAL COORDINATING COUNCIL FOR SCIENCE, ENGINEERING AND TECHNOLOGY

March 1986

Committee on Interagency Radiation Research and Policy Coordination

Office of Science and Technology Policy
Executive Office of the President
Washington, D.C. 20506

ORAU 87/J-78

CIRRPC
THIRD ANNUAL REPORT

June 30, 1987

Committee on Interagency Radiation Research and Policy Coordination

Alvin L. Young, Chairman

**Office of Science and Technology Policy,
Executive Office of the President
Washington, DC 20506**

IV. Organization and Reporting Structures

B. CIRRPC Organization

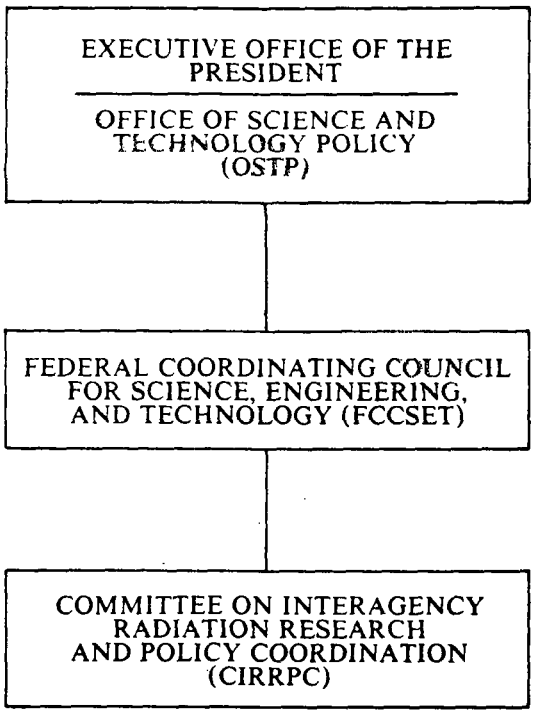

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Table of Contents

I. Introduction

The Committee on Interagency Radiation Research and Policy Coordination (CIRRPC) was established on April 9, 1984 by the Office of Science and Technology Policy (OSTP) under the authority of the Federal Coordinating Council for Science, Engineering and Technology (FCCSET), as shown in Figure 1. It is chaired by OSTP. CIRRPC membership consists of those agencies having specific responsibilities or interest in radiation research and/or policy.

CIRRPC has two elements: the Committee itself, consisting of subcabinet and senior policy level representatives, and a Science Panel, consisting of senior radiation scientists from the respective member agencies. The structure and membership of CIRRPC is shown in Figure 2. It was decided at the inception of CIRRPC to identify the radiation issues of concern to the Federal agencies, Congress, and professional societies faced with radiation policy or scientific issues. It was felt that a current list of national radiation issues should be assembled so that CIRRPC could concentrate on these issues and the dividends from CIRRPC's resources could be maximized at the earliest possible time.

II. Issues Development

At the first meeting of CIRRPC on May 25, 1984, each of the member agencies was requested to identify current radiation issues of concern to them. A similar request was also sent to appropriate congressional committee chairmen and members. National professional organizations concerned with radiation matters also responded.

In December 1984, the CIRRPC Executive Committee began a series of meetings with senior staff of each member agency. Specific matters affecting agencies' programs were brought to light, problem areas identified and invaluable perspectives gained into the major issues affecting Federal government operations, upon which CIRRPC must focus its attention.

Since the Congress and national professional societies provided their input quite independently from those of the Federal agencies, a further cross-section of opinion was achieved.

A number of Federal agencies, congressional respondents and professional societies have emphasized that the broad U.S. policies, regulations and standards that provide the overall umbrella for national radiation protection have not been systematically reviewed and updated since 1960, and that this is urgently needed. The Federal Radiation Council was disestablished in 1970, and this resulted in a loss of effectiveness in coordinating Federal policy on radiation issues. The Congress noted this lack of coordination and cohesiveness among the Federal agencies in policy-making and standards-setting and supported CIRRPC's efforts in this regard.

III. Listing of Issues

Ten national radiation issues were identified as follows:

- Federal Radiation Policy, Regulations and Standards
- Radiation Compensation
- Radon
- Non-Ionizing Radiation
- High-LET Radiation
- Food Irradiation
- Radioactive Wastes
- Radiation Measurements, Records and Control
- Public Information and Education
- Emergency Preparedness and Clean-Up Standards

IV. Definition and Aggregation of Radiation Issues

The preceding list of issues results from the aggregation of 34 specific issues into 10 major topics. Diverse policy, research, management and science issues were cited by the respondents and these are integrated into the 10 topics.

The purpose of this section is to list the composition of the 10 issues.

Federal Radiation Policy, Regulations and Standards

This issue includes the following elements or was expressed in the following ways:

- Need for consistent Federal radiation policies;
- Need for mutually consistent and coordinated radiation regulations and standards, particularly those involving multiple Federal agencies and jurisdictions;
- Establishment of radiation levels below regulatory concern (*de minimis*);
- Coordination of U.S. policies and positions on radiation issues at international policy meetings;
- Updating of U.S. radiation policy, regulations and review of existing standards (particularly revisions of 10 CFR Part 20 and FRC Report No. 1);
- Clarification of As Low As Reasonably Achievable (ALARA) policy;
- Need for scientifically-based standards;
- "Umbrella" dose limits, age-averaging, dose commitments, *in utero* standards and collective doses; and
- Introduction of a risk-based standards system, standardized radiation risk estimation and comparability with other risks.

Radiation Compensation

Compensation procedures for radiation injury have profound policy, legal and scientific implications. It is of primary interest to the Justice Department in adjudicating radiation injury claims of all types. The Veterans Administration is interested in the applicability of the Radioepidemiological Tables (for estimating the probability of causation of radiogenic cancers) to the many veterans' radiation injury claims related to low level radiation exposure. The Defense Department is concerned over the possible operational impact of occupational exposure of military personnel. The Interior Department is interested because of claims arising from exposure of native Americans and residents of the Pacific Trust Territories. The Department of Health and Human Services, which was assigned the task of preparing Radioepidemiological Tables by the Congress, is concerned over the appropriate use of the tables. The Labor Department and Nuclear Regulatory Commission also have an interest in this issue from the standpoint of worker exposures.

The Senate Subcommittee on Nuclear Regulation of the Committee on Environment and Public Works and the Senate Labor and Human Resources Committee held joint hearings on this subject in 1985. Those individuals alleging injury from radiation exposure and others such as professional societies, insurance groups, environmental groups, the medical community and the nuclear industry are also vitally interested in this issue.

This issue includes the following elements or was expressed in the following ways:

- Development of Radioepidemiological Tables, estimating the probability of causation of radiogenic cancers and their application;
- Applicability of input derived from Japanese nuclear bomb survivors, medically exposed populations, animal studies and cell/tissue research;
- Low-level radiation effects;
- Risk assessment models, methodologies and risk coefficients for various types of radiation at various human sites;
- Cancer inductions from external exposure and internally deposited radionuclides;
- Relating the biological effects of different types of radiation to one another;
- Genetic and hereditary effects; and
- Life shortening considerations.

Radon

The primary national interest in radon is currently focused on indoor radon, although outdoor radon has received Federal and state attention for more than a decade as it relates to uranium mill tailings and residues from mining, milling and processing of phosphate and other natural ores in the United States. There are specific populations which Federal agencies and Congress are concerned about, including: native Americans, uranium and other underground miners and residents near active and inactive uranium and phosphate mills. Recently, national attention has focused on indoor radon exposures in certain eastern U.S. states, such as Pennsylvania and New Jersey, where levels in houses are found to exceed levels used by the Federal government to clean up misused uranium mill tailings.

Inhalation of naturally occurring radon progeny results in a significant contribution to the average radiation dose to the overall U.S. population.

Radon exposure has been suggested as a significant contributor to the rate of lung cancer in the U.S., 83% of which is attributed to smoking.

This issue includes the following elements or was expressed in the following ways:

- Improved measurement techniques for absorbed doses from radon progeny, lung models and standard instruments;
- Determination of the magnitude of health risks from the inhalation of radon progeny through epidemiological studies;
- Improved state of knowledge of radon abatement measures;
- Need to inform the public in an authoritative and accurate way on the hazards from radon progeny and appropriate mitigating methods; and
- Need for a national radon agreement to determine average exposures and high dose areas in the U.S.

Non-Ionizing Radiation

The issue of non-ionizing radiation exposure as a potential public health hazard was raised by a number of Federal agencies and national organizations. The extensive and increasing use of equipment that generate various frequencies of non-ionizing radiation in telecommunications, electrical power generation, defense, consumer products and medical practice may be increasing exposure levels to non-ionizing radiation. The magnitude of this increased exposure of the U.S. population and any health consequences are not well known. This issue includes the nature and degree of exposure in the workplace, the home and in the environment.

This issue includes the following elements or was expressed in the following ways:

- Radiofrequency radiation effects, including those from radiowaves, radar and ultra-high frequency radiation;
- Laser radiation effects;
- Ultrasound effects; and
- Effects from high electrical and magnetic fields.

High-LET Radiation

The biological effects of high linear energy transfer (LET) radiation, such as neutrons, alpha particles, protons and heavy nuclei, are not as well known as those of low linear energy transfer radiation such as x-rays, gamma rays and beta radiation.

This issue includes the following elements or was expressed in the following ways:

- Neutron quality factors and relative biological effectiveness;
- Absorbed doses;
- Dosimetry;
- Dose response relationships at low doses and at the molecular, cell, tissue, organ and organism level; and
- The effects of internally deposited radionuclides.

Food Irradiation

The need for alternative treatment methods for disinfestation of food commodities arises primarily from the banning of carcinogenic or mutagenic chemical fumigants and other chemicals used for pathogen and pest control. Pressures on U.S. food processors, exporters and importers to evolve an alternative solution to chemical treatment have increased. There is a Federal rulemaking pending on using food irradiation in the United States and several petitions have been granted by the Food and Drug Administration for food irradiation. Several bills advocating food irradiation have been introduced in Congress and congressional interest and funding for food irradiation has undergone a marked increase in Fiscal Year '86.

This issue includes the following elements:

- The efficacy and safety of irradiated foods regarding nutrition, pest control, pathogen reduction, shelf life extension and unique radiolytic products;
- Labelling of irradiated foods;
- Employee training and public education;
- Dosimetry
- Food inspection;
- Plant design and radiation source supply;
- Regulatory issues — state, national and international;
- Interagency coordination; and
- Petitioning, rulemaking and clearance of irradiated foods.

Radioactive Wastes

The radioactive waste issue transcends the nuclear energy, national security and nuclear medicine sectors of our society. The issue has two components: control of large quantities of low level waste in which the concentration of radionuclides is relatively low (such as power reactor "trash," mill tailings and nuclear medicine "effluent") and control and disposal of relatively small quantities of high level waste that have significantly higher concentrations (such as defense waste from reprocessing and spent fuel elements from nuclear power reactors). The two components require significantly different considerations in treatment, form, disposal sites, packaging and transportation and state and Federal jurisdictions and responsibilities.

This issue includes the following elements or was expressed in the following ways:

- Storage and processing;
- Packaging of radioactive wastes;
- Transportation of radioactive wastes;
- Disposal of radioactive wastes — regional low-level waste disposal sites and high-level national waste repositories;
- Regional low-level waste compacts among states;
- Accelerator induced low-level wastes;
- Disposition of mixed chemical and low-level radioactive wastes; and
- Waste at levels below regulatory concern.

Radiation Measurements, Records and Control

The Federal agencies and professional societies have cited the need for accurate radiation measurements in the workplace, hospital and environment; quality control and calibration of dosimetric instruments; more comprehensive recording of individual radiation exposures and a better means to control occupational radiation exposure.

This issue includes the following elements or was expressed in the following ways:

- Need for better dosimetry and more sensitive instruments to measure high-LET radiation (neutron and alpha particles), particularly as such measurements are used to determine absorbed doses;
- Transportation accidents involving radioactive material;
- Need for a national occupational exposure registry;
- Need to improve record-keeping of collective and individual doses, especially dose histories for

individuals exposed in the workplace, home and hospital;
- The measurement and recording of mixed radiation (high and low-LET, external and internal) to organs, the whole body and extremities;
- Internal dose assessment models and model validation;
- Need for consistent and accurate radiation measurements, quality assurance system for dosimetric instruments and a standard means of instrument calibration; and
- Review of the Federal philosophy of radiation control, with regard to implementing a risk-based system.

Public Information and Education

This issue has two distinct components. The first is the inadequacy of communications and interactions between the Federal agencies, the scientific community, the public and the various segments of the media on ionizing and non-ionizing radiation. The second component concerns the reduced flow of scientists trained in radiation from academe to the Federal and industrial sectors.

This issue includes the following elements or was expressed in the following ways:
- Need for a coherent and coordinated Federal public information policy on radiation;
- Need for consensus by radiation scientists and their peers;
- Need to enhance public confidence in Federal and state authorities in radiation matters;
- Support of academe in the education and training of radiation scientists; and
- Need to reverse the loss of radiation scientists to government and industry.

Emergency Preparedness and Clean-Up Standards

The degree of preparedness of the Federal and state sectors to deal with radiation emergency situations is of interest to a number of Federal agencies. Among other topics, it includes the need for more detailed emergency guidelines and standards.

This issue includes the following elements or was expressed in the following ways:
- Emergency situations involving nuclear power plants, nuclear weapons and accidents involving various other types of nuclear facilities and materials;
- Responses to transportation accidents involving radioactive materials;
- Clean-up and evacuation criteria;
- Overall emergency personnel training and readiness of manpower and equipment;
- Terrorist activities involving radioactive material;
- Coordination of international, Federal, state and local jurisdictions on emergency actions; and
- Public interactions and media interfaces.

V. Disposition of Issues by CIRRPC

Federal Radiation Policy, Regulations and Standards

In February, 1985, CIRRPC formed a Science Subpanel on the subject chaired by the Environmental Protection Agency. The Subpanel focused its attention primarily on the issue of whether or not the recommendation of the International Commission on Radiological Protection, for a two-fold increase in the neutron quality factor, has a compelling scientific basis for its adoption. It is expected that the Subpanel will focus next on the scientific merit of using the concept of collective dose in radiation protection.

Radiation Compensation

On November 8, 1984, the President's Science Advisor transmitted the CIRRPC Science Panel Report No. 1 on the "VA Health Assessment of Veterans with Military Service at Sites of Temporarily Augmented Ionizing Radiation"[1] to the Administrator of Veterans Affairs. The report concluded, "that it is highly unlikely that new

or useful information regarding the health effects of radiation would result from the proposed epidemiological study of veterans exposed to radiation during military operations in Japan or at nuclear weapons tests."

On January 25, 1985, the Science Advisor forwarded to the Secretary of the Department of Health and Human Services (HHS), the Science Panel Report on the draft Report of the National Institutes of Health (NIH) Ad Hoc Working Group to Develop Radioepidemiological Tables. CIRRPC Science Panel Report No. 2[2] concluded that the "report of the Ad Hoc Working Group is an excellent and scientifically responsible document which provides probabilities of causation on the basis of the current knowledge on radiation carcinogenesis in man." However, the CIRRPC Science Panel went on to observe "that there are several aspects of the report that require attention to define more clearly the limitations of the tables. An improved discussion of the uncertainties inherent to the PC (probability of causation of radiogenic cancer) calculation and guidance concerning application of the radioepidemiological tables to high-LET radiations and internally deposited radionuclides are particularly important." In closing, the Panel advised that "To the extent that the Panel's concerns cannot be adequately addressed by the present Ad Hoc Working Group, it is suggested that they be considered by any future working group established to update the tables."

In its final report of January 4, 1985, HHS took into consideration many of the comments of the CIRRPC Science Panel. CIRRPC Science Panel Report No. 3[3] reviewed the final HHS report. On June 11, 1985, CIRRPC presented testimony before the Joint Hearing of the Senate Labor and Human Resources Committee and the Subcommittee on Nuclear Regulation of the Committee on Environment and Public Works.[4] The testimony, which was coordinated with CIRRPC's member agencies, represented the official position of the Executive Branch on the HHS report. The far-reaching consequences of the application of the HHS report touches virtually all of the CIRRPC member agencies. The testimony expressed caution on the application of the tables and recommended further refinement, research and reduction of the uncertainties in the calculations.

The Administrator of Veterans Affairs has asked CIRRPC's guidance on the applicability of the Radioepidemiological Tables to rulemaking pursuant to Public Law 98-542 concerning radiation exposure compensation of veterans.

Radon

The CIRRPC Executive Committee established a Science Subpanel on radon protection problems and health effects. The Subpanel charter was presented to CIRRPC in June, 1985, with the Department of Labor chairing the Subpanel. The Subpanel will develop a Federal consensus on scientific issues regarding environmental radon exposure, with particular emphasis on the magnitude of health risks, the assessment of national exposures, and the state of knowledge regarding radon abatement measures. A report is being prepared for release in the spring of 1986 and will concentrate on the indoor radon problem.

The Chairman of CIRRPC met with the Conference on Radiation Control Program Managers on May 20, 1985 to discuss the radon problem. The Conference is composed of radiation control officials of the state agencies dealing with radiation matters.

Non-Ionizing Radiation

In response to a request from EPA, a Science Subpanel was formed on April 25, 1985, under the chairmanship of the Veterans Administration to review existing research programs on radiofrequency health effects and to define appropriate research. A draft report on the health effects of radiofrequency radiation was submitted to CIRRPC's Science Panel in February, 1986 and the final report is scheduled to be issued in the spring of 1986.

High-LET Radiation

In February, 1985, CIRRPC took up the issue of high linear energy transfer radiation, under the Chairmanship of the Department of Health and Human Services. This Subpanel's task includes: monitoring of ongoing scientific assessments of such groups as National Council on Radiation Protection and Measurement (NCRP), National Academy of Sciences (NAS), National Research Council's Committee on the Biological Effects of Ionizing Radiation (BEIR), and International Commission on Radiation Protection (ICRP). The Department of Energy submitted a "Multiagency Research Plan for Resolving Problems Associated with Low Level Exposure to Neutrons" to CIRRPC for review.

Food Irradiation, Radioactive Wastes, Radiation Measurements, Records and Control, Public Information and Education and Emergency Preparedness and Clean-up Standards

CIRRPC has not taken up these five issues since no requests to explore these issues have been received from Federal agencies. However, a proposed Congressional bill has a provision that CIRRPC coordinate Federal food irradiation activities.

In addition to the above activities, CIRRPC formed policy subpanels on SI Metric Units and Radio-epidemiological Tables.

VI. Summary

CIRRPC has identified the major radiation issues of concern in the United States. It has taken action on five of the 10 issues as requested by Federal agencies.[5]

VII. References

1. CIRRPC Science Panel Report No. 1 — "VA Health Assessment of Veterans With Military Service at Sites of Temporarily Augmented Ionizing Radiation," September 7, 1984.

2. CIRRPC Science Panel Report No. 2 — "CIRRPC Scientific Report on the Draft Report of the Ad Hoc Working Group to Develop Radioepidemiological Tables," November 6, 1984.

3. CIRRPC Science Panel Report No. 3 — " CIRRPC Scientific Report on the Report of the Ad Hoc Working Group to Develop Radioepidemiological Tables," June 1, 1985.

4. CIRRPC Testimony before the Committee on Labor and Human Resources and Subcommittee on Nuclear Regulation of the Committee on Environment and Public Works, " Hearings on Report of the National Institutes of Health Ad Hoc Working Group to Develop Radioepidemiological Tables," June 11, 1985.

5. "First Annual Report — Committee on Interagency Radiation Research and Policy Coordination," June 30, 1985.

Figure 1 — CIRRPC's Location in Executive Branch

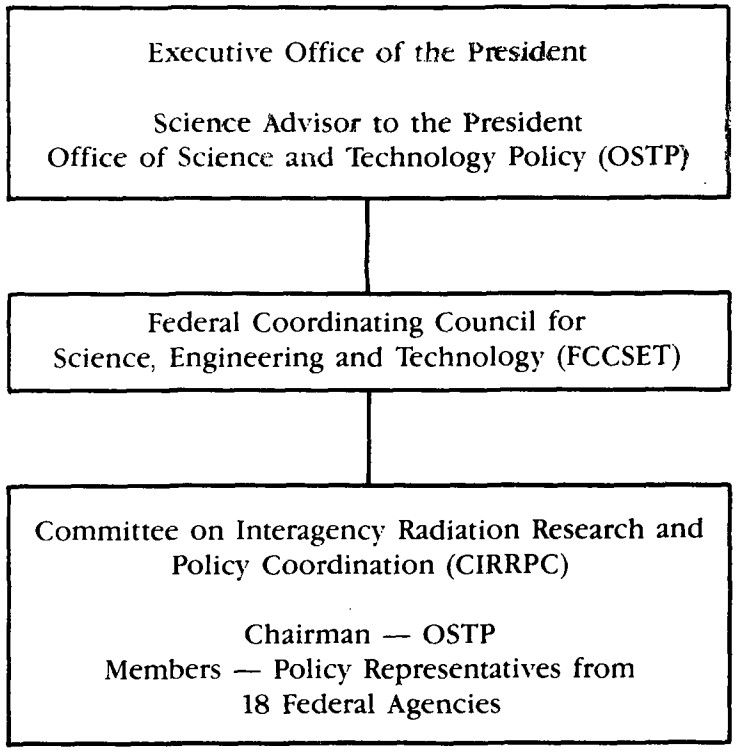
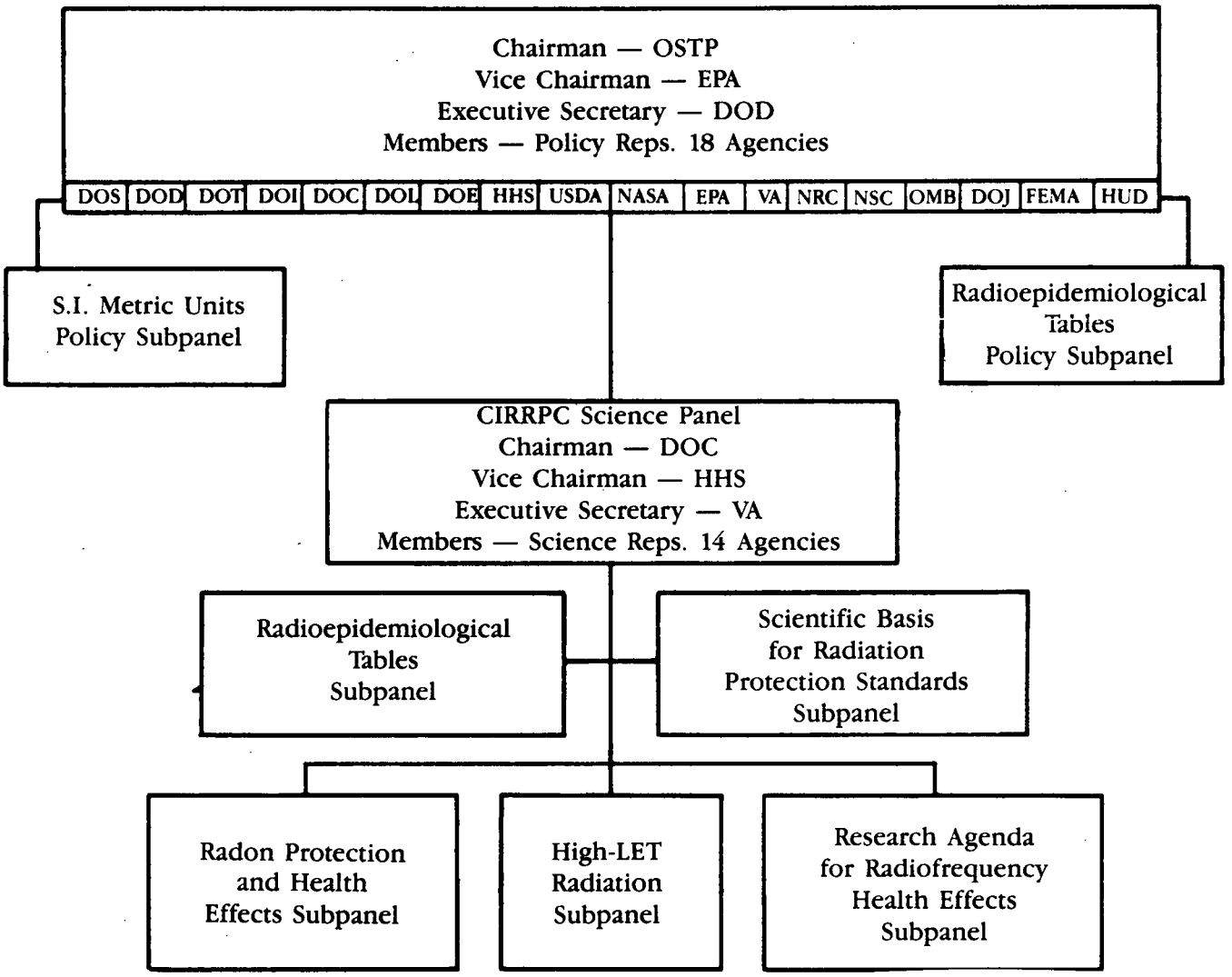


Figure 2 — CIRRPC's Organizational Structure



INFORMATION ON CRCPD POSITION

ON NARM REGULATION

Prepared for
U.S. Nuclear Regulatory Commission

May 5, 1988

Statement to the Nuclear Regulatory Commission
by the Conference of Radiation Control
Program Directors

May 5, 1988

I am T. R. Strong, Chief of the Office of Radiation Protection for the state of Washington and Chairman of the Conference of Radiation Control Program Directors. I and my 51 counterparts in the states, Washington D.C., and Puerto Rico, make up the Conference of Radiation Control Program Directors.

Our purpose in being here is to comment on your staff document NUREG-1310 on Naturally Occurring and Accelerator Produced Radioactive Materials (NARM); and to reaffirm the position of the Conference with regard to NARM: We believe there should be uniform nationwide regulation of discrete sources of naturally occurring and accelerator produced materials; we believe the Nuclear Regulatory Commission is the appropriate agency at the federal level to provide for such a uniform regulatory program.

With me today are Bill Dornsife, our member from Pennsylvania, and Charles Hardin, Executive Secretary of the Conference.

Because of who we are, we believe we are not being presumptuous when we remind you that:

-- Under the authority granted by Congress to the Commission, the 29 Agreement States license and regulate 65 percent of the uses of radioactive materials in the United States (leaving NRC only 35 percent).

-- These 29 Agreement States regulate NARM using more or less the criteria they and the NRC have developed to regulate all radioactive materials.

-- Four of the 21 non-Agreement States (Deleware, New Jersey, Pennsylvania, and Virginia) have NARM licensing programs, and of the remaining 17, twelve states who perhaps are most in need of a regulatory program, exercise little or no NARM control activity. The Conference's "Licensing State Program" sets criteria, evalautes programs, and recognizes those states which meet the criteria as NARM licensing states. But no non-Agreement State, where it would be most appropriate, participates in our voluntary program. It is these 12 states about whom we are most concerned and who represent a potential significant public helath issue.

Your staff report in NUREG-1310 does not recommend that the Commission assume or seek authority for the regulation of NARM. The Conference takes this opportunity to disagree with your staff report.

First, we believe it is inconsistent for you to not regulate naturally occurring radionuclides:

-- You now regulate many radionuclides produced in cyclotrons or reactors and which are in common usage in nuclear medicine. At the same time, there are at least eight radionuclides, also in common usage in nuclear medicine but which are produced in accelerators; you do not regulate these: carbon 11, nitrogen 13, oxygen 15, cobalt 57, gallium 67, indium 111, iodine 123, and thallium 201. Both groups of radionuclides, used side by side in nuclear medicine, represent potential human exposure and environmental contamination issues; yet they are not regulated equally. It is an inconsistent policy. (As an aside, NUREG-1310 also states that the nuclear medicine business is over-regulated; we seriously disagree with that conclusion.)

-- You made a significant regulatory response to generally licensed static eliminators manufactured by the 3-M Company when these devices were discovered to be leaking polonium 210. Even when found in consumer products, the potential for human exposure and/or adverse health impacts was very minimal. At the same time, you do not regulate naturally occurring radium which is still used in medicine, represents a significant disposal problem, and is a potential for human exposure far in excess of any that might be represented by the polonium in static eliminators. We think your actions have been inconsistent.

-- While you do not regulate radium, you have apparently recognized that it represents a disposal problem because you have issued nonbinding guidance on how an individual who finds himself in possession of naturally occurring radionuclides might proceed to adequately dispose of such materials (as published by the NRC in the Federal Register, Volume 46, Number 205, October 23, 1981). While you have recognized the problem "informally", you still decline to take the next step: regulation by rule.

While we think it is an inappropriate position to take, we understand why your staff is suggesting NRC send the issue to CIRRPC and why they have not proposed to go directly to Congress. We are good bureaucrats, too; we understand the issues of budget, resources, politics, and your concern for the potential negative consequences of inviting Congress to open up the Atomic Energy Act. While we understand why you might have taken this position, we also think this public health issue is being given the bureaucratic treatment, and ask that you consider these points:

-- We do not believe NUREG-1310 exhausts the possibilities for examining how NRC might effectively regulate NARM under its existing authority.

-- We think you can, and if you wanted to, could, begin to regulate the discrete sources of NARM now, without additional authority from Congress.

-- If you cannot do this, we think you must take the issue to Congress, if not to ask for authority for NRC to regulate NARM, then at least to begin full discussion of the issue with Congress.

If you cannot take the NARM issue to Congress, then we will continue to search for a mechanism which will allow us to take it to Congress. In that event, what will the NRC's position be? Will you oppose Congress delegating responsibility for NARM to you (assuming, of course, that adequate authority and resources are provided to you to do the job)?

I have met with Chairman Zeck twice (in September 1986 when the Conference's Executive Board met with him and in October 1987 at the Agreement States Meeting in Louisville). On both occasions he clearly indicated that if the states have an issue which they cannot resolve without help. Admiral Zeck (if not the entire Commission?) would come to our rescue. I believe the NARM issue meets the criteria he set. The preeminant responsibility of government is clearly to protect the public health and we believe you should move rapidly on this issue. It certainly involves radioactivity and it definitely has potential public health implications.

Introduction

There are a variety of radioactive materials which can be found in nature, and any materials can be made radioactive through nuclear bombardment by high energy particles from accelerators. These Naturally Occurring and Accelerator-Produced Radioactive Materials (NARM) represent a potential public health risk equal to, and in many cases, greater than, radioactive materials which are produced in the fission process. Some radionuclides are produced on a commercial scale both in accelerators and in reactors.

The types and energies of radiation emitted from NARM are similar to those of By-product materials. The radioactive decay process is similar with NARM and By-product materials. The biological effects from exposure to NARM are similar to By-product materials. Methods used to measure and detect NARM are similar as for By-product material.

NARM and By-Product material are similar, in their radiation characteristics, i.e. alpha, beta and gamma emissions. There are two major differences between NARM and By-product material, which are:

1. The manner by which they are produced, and
2. The manner by which they are regulated

Their manner of production has been previously discussed. In regard to the manner by which they are regulated, various studies conducted by both the NRC and the Conference of Radiation Control Program Directors, Inc., have concluded that the regulation of NARM in the United States is not uniform, fragmented, and in some cases, totally absent.

Congress, through the enactment of the Atomic Energy Act, provided for the very strong regulation and control of By-product, Source, and Special Nuclear Meaterials. However, at the time of the passage of the Atomic Energy Act in 1954, the major focus and attention of Congress was to assure the public health and safety in the peaceful use of the "new" radioactive material. In 1954, very little accelerator produced radioactive material was in use and little concern was given to radioactive materials in nature, except of course, ores containing uranium and thorium, which through processing, could be used as fuel for reactors and nuclear weapons. As a result, the Atomic Energy Act only addressed those types of radioactive materials, therefore NARM was excluded in the 1954 Act.

The consequence of NARM's omission from the Atomic Energy Act is the absence of an adequate and uniform national control of this material. The only regulation and control of NARM has been in certain state and local governments but the degree and level of control among these states has been very inconsistent. The

protection of the health and safety of the public from exposure to NARM has and continues to be at a substantially lower level then that for By-Product materials of comparable hazard.

Conference of Radiation Control Program Directors, Inc.

The Conference of Radiation Control Program Directors, Inc. (CRCPD), is an organization made up of the radiation control staff of each state, the District of Columbia, Puerto Rico, and certain metropolitan areas.

The CRCPD was formed in 1968, and incorporated in the State of Arkansas in 1975. Prior to 1981, all administrative duties were managed by officers of the organization. In February of 1981, the CRCPD employed a full time Executive Secretary to manage the day to day operations. With the establishment of the Office of Executive Secretary (OES), a permanent office was located in Frankfort, Kentucky.

The current membership of the CRCPD is 430 members. There are five classifications of membership. These are Members, who are the directors of the respective radiation control programs; Associate Members, who are the staff of the Members; Emeritus Members, who are past members or Associate Members; Foreign Members, who are personnel responsible for radiation control outside the United States; and Special Members, who are radiation control personnel from Indian Tribes and U.S. Territories. The "Members" are the voting membership of the organization. There are 52 voting members, with DC and Puerto Rico being the two in addition to the fifty states.

The organization is controlled by an Executive Board, made up of seven individuals from the membership. The current Board membership is as follows:

Chairman: T.R. Strong (Washington)
Chairman-Elect: Charles Tedford (Arizona)
Past-Chairman: John Eure (Iowa)
Treasurer: Michael Mobley (Tennessee)
Member-At-Large: Robert Hallisey (Massachusetts)
Member-At-Large: James Hickey (Rhode Island)
Member-At-Large: Robert Funderburg (Louisiana)

The major financing of the CRCPD is through a Cooperative Agreement with the Food and Drug Administration (FDA). Although the FDA administers (and contributes funding to) the Cooperative Agreement, other funding is provided by three additional federal agencies, under interagency agreements with FDA. These other federal agencies are the U.S. Nuclear Regulatory Commission, the U.S. Environmental Protection Agency, and the Federal Emergency Management Agency. Each of these supporting agencies has a Liaison that sits on the Board, and attends all Board meetings. These federal Liaisons provide technical input and guidance relative to the issues under consideration.

The goals and objectives of the CRCPD, as stated in the By-Laws are:

1. to promote radiological health in all aspects and phases,
2. to encourage and promote cooperative enforcement programs with federal agencies and between related enforcement agencies within each state,
3. to encourage the interchange of experience among radiation control programs,
4. to collect and make accessible to the membership of the Conference such information and data as might be of assistance to them in the proper fulfillment of their duties,
5. to promote and foster uniformity of radiation control laws and regulations,
6. to encourage and support programs which will contribute to radiation control for all,
7. to assist the membership in their technical work and development, and
8. to exercise leadership with radiation control professionals and consumers in radiation control development and action.

The major technical issues of the CRCPD are addressed by various technical Committees and/or Task Forces. The attachment is a listing of the current working groups, their membership, and charges.

For additional information on the CRCPD, please contact:

Charles M. Hardin, Executive Secretary
71 Fountain Place
Frankfort, Kentucky 40601
Phone: 502/227-4543

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS, INC.
COMMITTEES/TASK FORCES AND CHARGES
DECEMBER 10, 1987

E-1 Environmental Nuclear Council

1. To assure that the concepts and ideas of the CRCPD membership are being properly addressed by the various task forces and committees.
2. To provide coordination and guidance to the committees/task forces as liaison for the Executive Board.

E-2 Committee on Evaluation and Distribution of Radioactive Sources and Devices not Manufactured under the Atomic Energy Act (NARM)

1. To assist and encourage the NRC in the transfer of information contained in the CRCPD Radioactive Materials Reference Manual (RMRM) to the NRC Sealed Source and Device Registry, and to maintain the RMRM for use by the states until such transfer occurs.
   Milestone:The goal for the final date of completing the transfer of information from the RMRM to the NRC Registry is December 31, 1988.
2. Promote the use of the guides by states for the inspection of manufacturers and distributors of NARM products, and the criteria for granting of extended leak test intervals for sealed sources containing NARM. Annually monitor and review NARM guides and make needed amendments. Report to the Executive Board biannually on the status of the use of such guides by the states.
3. Provide technical assistance and consultation to the Suggested State Regulations for the Control of Radiation, Part "N" group to develop suggested regulations in the NORM area.

E-3 Task Force on Criteria for Adequate Radiation Control Program - Radioactive Materials (TERMINATED)

E-4 Committee on Natural Radioactivity Contamination/Decommissioning and Decontamination Problems

NORM Activities/Oil & Gas Production

1. Provide assistance to the CRCPD, individual states and Federal agencies in scoping the problem of contamination by Naturally-Occurring Radioactive Material (NORM).
2. Assist in developing appropriate radiation protection guidance and criteria.
3. Assess the impact of NORM contamination.
4. Serve as mechanism for state/Federal interaction in the area of NORM.
5. Continue to review and recommend new guidance on soil contamination.
6. Identify processing areas where potential NORM contamination

could occur in oil and gas production/processing operations.

7. Provide recommendations on environmental and operational criteria.
8. Identify physical/chemical properties of NORM contamination in oil and gas production/processing operations.
9. Provide options/alternatives for disposal of NORM waste from oil and gas production/processing operations.
10. To prepare an updated report, for Executive Board approval, which identifies an inventory of types of NORM sources their magnitude in terms of volume of material involved, their geographical distribution, and an estimate of the potential individual and population exposure (person-Rem) involved.

NORM Regulations

11. In conjunction with the NARM Committee, provide technical assistance, advice and recommendations to the SSRCR, Part "N," in the development of NORM Regulations.

Decommissioning and Decontamination Problems

12. Review draft Federal Register Notices, and major support documents relating to decommissioning and decontamination facilities, and provide comment to appropriate Federal agencies regarding these documents.
13. Review Federal Register Notices regarding decommissioning and decontamination facilities, and provide comments regarding these documents to the Executive Board.
14. The Committee Chairman, or his designated alternate, (to be approved by the CRCPD Chairman), will represent the CRCPD on the Federal Interagency Working Group on Decommissioning and Decontamination.

E-5 Committee on Low-level Radioactive Waste Management

Charge to be developed.

E-6 Committee on Emergency Response Planning

1. To address the technical issues regarding any radiological emergency planning or response. Included in these issues, but not limited to, are such matters as instrumentation, dose assessment or projections and/or calculations, protective drugs, decontamination, environmental analysis, and radiological team equipment in general. The Committee is to provide recommendations on the technology and approaches to the various technical problems in emergency response and planning.

E-7 Committee on Clean Air Act

1. To survey the states to determine interest of assuming delegation for implementing the radionuclide emissions component of the Clean Air Act.

Milestone: Survey to be completed and a report of results by the 1988 Annual Meeting.

2. The Committee should investigate the progress of NRC on the update of 10 CFR 20 to determine the impact of contemplated changes on current air standards.

Milestone: not applicable.

3. To develop a draft document for guidance to states on procedures to follow in applying for, and assuming delegation of, implementing provisions of the Clean Air Act relating to radionuclide emissions.

Milestone: 4th quarter of 1988.

4. The Committee shall assist EPA in the development of criteria for state assumption of the Clean Air Act authority for the regulation of radionuclides.

Milestone: not applicable.

E-8 Committee on Uranium Tailings Criteria Review for Active and Inactive Impoundments

1. To review EPA's final standards for the conduct of the Uranium Mill Tailings Remedial Action Program for the inactive mill, the disposal and vicinity sites (40 CFR 192) upon their availability, and provide technical comments and recommendations to the Executive Board.
2. To review any NRC regulation and/or DOE implementation plan based on an EPA standard, and provide comments and recommendations to the Executive Board for their action.

E-9 Committee on High-level Radioactive Waste (TERMINATED)

E-10 Task Force on Criteria for Adequate Radiation Control Program - Environmental Monitoring and Surveillance (TERMINATED)

E-11 Committee on Decommissioning and Decontamination (TERMINATED/Combined with E-4.)

E-12 Committee on Transportation Education

1. To review applicable Federal transportation regulations and other available literature as appropriate, for both high and low-level radioactive shipments, and develop a document(s) or other training packages to be utilized by state radiation control programs and/or for training of others regarding transportation regulations. The document(s) should include inspection procedures and sample forms for data collection and evaluation.
2. To develop a guidance document on the risk of transporting radioactive materials which can be used by state radiation programs for informing the public and other interested parties of such risks.

E-13 Committee on Radon Policy

1. To recommend actions by the CRCPD to assist states in the radon issues.
2. To develop criteria which can be used by states in assessing the potential for radon in structures in their respective states.
3. To identify radon measurement needs in state programs, specify

kind of measurement equipment needed and recommend methods for making radon measurements.

4. To develop criteria for guidelines for procedures to correct the problems when radon is discovered in structures.
5. To develop recommended guidelines for dealing with the public on the radon issue.
6. To develop regulation requirements versus non-regulatory requirements as related to radon exposure.
7. Regarding radon issues, meet and/or communicate with ORP, and the Office of Research and Development, CRCPD concerns, and to determine the following:
   a. what their specific products are that are on line,
   b. what directions they are planning to go for the next 12-24 months, and
   c. what problems they foresee.

   The Committee is to communicate back to the Executive Board on a quarterly basis results of the above communications.

E-14 Committee on Bonding and Surety

1. To review the CRCPD document entitled "Task Force Report on Bonding and Perpetual care of Nuclear Licensed Activities," January 20, 1975, and other appropriate documents, to determine the need for current and update guidance to the states relative to bonding and surety requirements.
2. If new guidance is needed on bonding and surety requirements, as determined from charge #1, to develop such guidance for the states.

E-15 Task Force on Procedures Manual - Radioactive Materials

To be developed by Task Force.

E-16 Criteria for Adequate Radiation Control Program - Radon

Develop a document on what constitutes an adequate radiation control program for radon, to be paralleled to other criteria documents currently published by CRCPD.

Milestone:the document be produced in first draft and be made available at the 1988 Annual Meeting and final draft be produced no later than the end of the 1988 year.

H-1 Healing Arts Council

1. To assure that the concepts and ideas of the CRCPD membership are being properly addressed by the various committees and task forces.
2. To provide coordination and guidance to the committees/task forces as liaison for the Executive Board.

H-2 Task Force on Criteria for Adequate Radiation Control Program - Nonionizing (TERMINATED)

H-3 Committee on Medical Practice

To promote the safe and efficacious use of medical and dental x-ray procedures by:

1. updating a survey of state programs to determine the extent of state, county, city, etc., required administrative and occupational x-ray procedures;
2. eliciting support of the radiation control agencies in a national program to reduce the number of unproductive administratively required x-ray examinations;
3. encouraging the radiation control agencies to provide technical support to groups promoting consumer/patient education in radiological health;
4. to provide radiation control agencies with a CRCPD contact and clearinghouse for problems related to the use of radiologic procedures;
5. developing and disseminating to state radiation control programs, an informational package on optimum techniques for conducting radiographic scoliosis examinations and to promote dissemination of that information to appropriate professional and consumer groups;
6. investigating medical users of radium including nasopharyngeal applicators; and
7. developing guidance in the area of efficacy of high-tech imaging modalities.

H-4 Committee on Nationwide Evaluation of X-Ray Trends (NEXT)

1. To develop a system whereby states may collect survey data from diagnostic radiological procedures consistent with their needs.
2. To encourage and assist states in analysis and use of that data.
3. To provide methods for determination of problem areas during facility inspections.
4. To evaluate, on a continuing basis, the system and methods developed, and to make modifications as appropriate to meet changing states needs.
5. In coordination with the Task Force on Quality Assurance, review and update a manual of survey procedures and protocol to be used in the uniform evaluation of diagnostic x-ray facilities, that can be used as a "standard" for such evaluation.

H-5 Task Force on Credentialing Program for Allied Health Operators (TERMINATED)

H-6 Committee on Training and Communications

The Committee on Training and Communications shall:

1. receive, evaluate and summarize reports from Regional Training Committees and identify training needs that must be approached on a national level;
2. evaluate whether training is an appropriate solution to the stated problem, and if so, determine the most cost-effective mode of training to be employed;
3. working with other agencies and organizations, develop and

catalogue a list of training options as well as a list of resources for training or funding, and provide these to the Regional Training Committees;
4. working with other agencies and organizations, develop necessary training not otherwise provided;
5. evaluate the training proposed for the Regional Training Meetings;
6. recommend to the Chairman of the CRCPD whether or not to approve the Regional Training Meetings and the number of CRCPD-sponsored attendees;
7. serve as a reviewing body for proposed training packages and public information documents, as requested; and
8. make recommendations regarding the structure and function of the Regional Training Committees.
9. to prepare a glossary of radiation protection principles and terms which can be used by the states in communicating with the news media.

H-7 Committee on Quality Assurance in Diagnostic X-ray

1. Determine the elements of diagnostic x-ray technique that impact image quality and patient exposure in adult and pediatric exams to aid facilities in maintaining minimal patient exposure and consistent high quality diagnostic images.
2. Recommend and develop information useful to states in implementing a quality assurance program.
3. In coordination with the Committee on NEXT, review and update a manual of survey procedures and protocol to be used in the uniform evaluation of diagnostic x-ray facilities, that can be used as a "standard" for such evaluation.

H-8 Committee on Nonionizing Radiation

1. To provide a mechanism for effective state/Federal control of nonionizing radiation producing products and/or devices.
2. To define the role of Radiation Control Agencies in action programs designed to adequately protect the public's health from the use of these products or devices.
3. To devise and/or develop recommended procedures to insure timely action, especially in the area of laser light shows and suntanning products.
4. To develop recommended radiofrequency levels around specific source environments (siting criteria).
5. Review proposed standards or changes in existing regulations for effectiveness, practicality, and impact on state radiation control programs.
6. Provide a focus for the exchange of information and a mechanism for updating skills of state personnel through CRCPD-sponsored seminars, meetings, etc., to insure the maximum efficient utilization of resources.

H-9 Committee on Ionizing Radiation Therapy

1. Identify radiological health issues that must be addressed to assure safe, efficient operation of radiation therapy

installations. This includes calibration, quality assurance and operation of units, as well as installation design.

2. Develop a recommended inspection program that is cost-effective and appropriate for the average state radiological health program, preferably placing demands on the facility to make tests and keep records.
3. Provide recommendations to the CRCPD committees working on the therapy aspects of the Suggested State Regulations, and other committees or task forces as appropriate. Consideration should be given to recommending consolidation of all radiation therapy regulations in one part of the SSRCR.
4. Develop criteria that can be used to evaluate the adequacy of a state radiation control program for therapy installations. Consider mechanisms that will help to ensure compatibility among Federal and state programs in the enforcement of radiation protection standards and regulations.
   NOTE: Charge #4 has not been implemented, but will be implemented upon recommendation of the Committee Chairperson.
5. Address "Site Specific Therapy" by the following activities:
   a. Establish the purpose and scope of the project. Site-specific therapy refers to radionuclides (often Iodine-131) tagged to monoclonal antibodies in large quantities (hundreds of millicuries per dose).
   b. Identify the drug kits approved by FDA for production and use for site-specific therapy.
   c. Establish parameters for manufacturing kits including, but not limited to, air flows, decontamination, filter integrity, biochemical/radiochemical interactions.
   d. Establish training criteria for physicians and technicians.
   e. Establish patient health physics (dose criteria) considerations. (Hospitals and/or clinics)
   f. Project future use (kits, manufacturing, etc.).
   g. Establish rules for site-specific therapy.

H-10 Committee on Qualifications for Non-State X-ray Inspectors

1. To develop a guide for state use in the implementation of the criteria for non-state inspectors, as previously developed by the Committee.

SR-1 Suggested State Regulations Council

1. To develop long range plans for the various working groups.
2. To assure that technical review is performed for the proposed suggested regulations.
3. To assure that each part is properly coordinated, and does not conflict, with other parts of the suggested regulations.

SR-TR SSRCR - Technical Review Committee

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model

regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.

SR-A SSRCR - Part A (General Provisions)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.

SR-B SSRCR - Part B (Registration of Radiation Machines, Facilities and Services)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.

SR-C SSRCR - Part C (Licensing of Radioactive Material)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.

SR-D/ SSRCR - Part D (Standards for Protection Against Radiation)/
SR-J Part J (Notices, Instructions, and Reports to Workers: Inspections)

1. To consider the addition of a new regulation which would require the use of personnel dosimeters which have been certified under the NVLAP criteria.
2. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
3. To recommend to the CRCPD, changes in the existing model regulations.
4. To develop new regulations deemed necessary because of new

technical developments or Federal requirements.
5. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.
6. To include the drafting of a regulation pertaining to removal of warning labels from empty containers which formally contain radioactive materials.

SR-E/ SR-W SSRCR - Part E (Radiation Safety Requirements for Industrial Operations)/Part W (Well Logging)

1. The development of model regulations for "Radiation Safety Requirements for Industrial Operations."
2. To develop model regulations for radiation safety requirements for wireline service operations and subsurface tracer studies.

SR-F SSRCR - Part F (X-rays in the Healing Arts)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.

SR-G/ SR-L SSRCR - Part G (User of Sealed Radioactive Sources in the Healing Arts)/Part L (Nuclear Medicine)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.
5. To provide review and comment to NRC on proposed amendments to 10 CFR 35.
6. To participate and contribute in the development of NRC Program for Regulation of Misadministration in Nuclear Medicine.

SR-H SSRCR - Part H (Radiation Safety Requirements for Analytical X-ray Equipment)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations

during the processes of updating, changing, or developing new regulations.

SR-I SSRCR - Part I (Radiation Safety Requirements for Particle Accelerators)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.

SR-J SSRCR - Part J (Combined with SSRCR - Part D)

SR-K Committee on Suggested State Regulations for the Control of Radiation (Radiopharmacy) (TERMINATED)

SR-L SSRCR - Part L (Nuclear Medicine) (TERMINATED/Combined with SSRCR - Part G)

SR-M SSRCR - Part M (Low-level Radioactive Waste)

1. To annually review and update existing CRCPD Suggested State Regulations for Control of Radiation.
2. To recommend to the CRCPD, changes in the existing model regulations as related to low-level waste, such regulations must be compatible with 10 CFR 61.
3. To develop new regulations deemed necessary because of new technical developments or Federal requirements.
4. To strive for compatibility with pertinent Federal regulatyions during the processes of updating, changing, or developing new regulations.

   Comment: Where appropriate, the subcommittee should consult with the CRCPD Committee on Radioactive Waste Management (E-5) for assistance.

SR-N SSRCR - Part N (NORM Regulations)

1. To develop Suggested State Regulations for the Control of Radiation in the area of "Naturally Occurring Radioactive Materials." Where appropriate, the sub-committee should obtain technical assistance from the CRCPD Committee on Natural Radioactivity Contamination/Decontamination and Decommissioning Problems (E-4), and the Committee on Evaluation and Distribution of Radioactive Sources and Devices not Manufactured Under the Atomic Energy Act (E-2).

SR-T SSRCR - Part T (Transportation)

1. To review applicable Federal and state radioactive material transportation regulations, including those for high-level waste

and low-level waste shipments.
2. To develop model regulations on transportation deemed necessary.
3. To strive for compatibility with pertinent Federal regulations during the processes of updating, changing, or developing new regulations.
4. To consider the new Colorado legislation on transportation, with the suggestion that similar information be incorporated into Suggested State Regulations.

SR-U SSRCR - Part U (Uranium Mills and Tailings)

1. To develop Part U regulations relative to uranium mills and tailings for inclusion in the SSRCR's.

SR-W SSRCR - Part W (Well Logging) (Combined under SSRCR-Part E.)

SR-II Suggested State Regulations for the Control of Radiation (SSRCR) Volume II - Nonionizing

1. To review, expand, and update the Suggested State Regulations for the Control of Radiation (SSRCR), Volume II, Nonionizing Radiation (ultraviolet radiation, especially suntanning booths, and mercury vapor lamps).
2. To review and comment on the ANSI Laser Standard.

GC General Council

1. To assure that the concepts and ideas of the CRCPD membership are being properly addressed by the various committees and task forces.
2. To provide coordination and guidance to the committees/task force as liaison for the Executive Board.

G-1 IOAC (TERMINATED)

G-2 Committee on Ionizing Measurements

A. Ionizing Measurements

1. Publication of the revision of a report prepared under previous contract to NBS, entitled "Ionizing Radiation Measurement Criteria for Regulatory Purposes." Inclusion of basic measurement assurance concepts in the revised report.
2. Revision of criteria for operation of the pilot regional calibration laboratories under development in Illinois, South Carolina, and Washington. These criteria will include a specific description of periodic interactions with NBS, and will be applied to future additional laboratories for this type.
3. Preparation of recommended terminology for the measurement of ionizing radiation, for use in the next edition of the Suggested State Regulations for Control of Radiation.
4. Revision of the "Directory of Commercial Calibration Services for Ionizing Radiation Survey Instruments," which was prepared under the previous contract to NBS.

5. To demonstrate and document the methods utilized in the measurement process of ionizing radiation.

B. Liaison with Interagency Committee on Occupational Radiation Protection Measurements

1. Represent and coordinate state concerns in the areas of personnel monitoring, bioassay measurements, and survey instrument performance, and liaison with an Interagency Committee on Occupational Radiation Protection Measurements.

C. Calibration Laboratory Review

1. Review and evaluate regional ionizing radiation calibration laboratories using established criteria for the operation of such laboratories. If such evaluation indicates that the laboratories meet the performance standards of the established criteria, then CRCPD will issue a letter of accreditation to the laboratories.

D. Liaison with Health Physics Committee

1. To represent the CRCPD on the Health Physics Committee for the purpose of establishing criteria for the accreditation of calibration laboratories in the private sector.

G-3 Committee on Nonionizing Radiation Measurements (TERMINATED)

G-4 Committee on Radon Measurements (TERMINATED)

G-5 Personnel Dosimetry - Liaison to NBS Interagency Policy Committee (Combined under G-2.)

G-6 Liaison - NRC: 10 CFR 30, 40, and 70

1. To provide review and comment to NRC on proposed amendments to 10 CFR 30, 40, and 70.

G-7 Liaison - ANSI: Committee 43

1. To represent the CRCPD on all matters pertaining to the development of standards addressed by the American National Standards Institute, Committee 43 (equipment for non-medical radiation applications).

G-8 Liaison - NRC: 10 CFR 20

1. To actively participate in the development of, as well as the review and comment to NRC on proposed amendments to 10 CFR 20.

G-9 Committee on Resolutions

1. The Executive Board shall establish a Resolutions Committee consisting of the two most immediate past CRCPD Chairpersons. The Executive Board shall identify one of the members as a

Chairperson.

2. No proposed resolution will be considered by the Executive Board unless such proposal has been reviewed by the Resolutions Committee.
3. All proposed resolutions shall be submitted to the Resolutions Committee which shall review the proposal for consistency with the Constitution and By-laws of the CRCPD, and with established policy of the Executive Board.
4. Any member desiring to propose a resolution for consideration prior to the CRCPD Annual Business Meeting shall submit such proposal, with a brief background statement as to the purpose therefore, to the Chairperson of the Resolutions Committee not later than 60 days prior to the Annual Meeting.
5. The Resolutions Committee shall review the format, content and objectives of the proposed resolution for consistency with the overall objectives of the CRCPD.
6. At least 30 days prior to the Annual Meeting, the Chairperson of the Resolutions Committee shall provide comments and recommendations to the member(s) proposing the resolution. A copy of the proposal and committee comments and recommendations shall also be sent to the Executive Board at least 30 days prior to the Annual Meeting.
7. After consideration of the Resolutions Committee's recommendations and comments, the originator(s) of the resolution shall provide the Chairperson of the Resolutions Committee with at least 60 copies of the final proposal not later than 15 days prior to the Annual Meeting. The Chairperson of the Resolutions Committee shall make the proposed resolution available to members of the CRCPD prior to the Annual Meeting.

G-10 Committee on Awards Selection

1. The Awards Selection Committee shall review nominations submitted by any member of the CRCPD, its employees, or other interested persons, and from such review make recommendations to the Executive Board.
   NOTE: The name(s) of any candidate as recommended by the Awards Selection Committee shall be made to the Executive Board prior to January 1 of each year in which an award is to be presented.

G-11 Ad Hoc Committee on Review of 10 CFR 35 (TERMINATED)

G-12 Ad Hoc Committee on Review of State Status Questionnaire (TERMINATED)

G-13 Liaison - American College of Radiology

1. To provide liaison for the CRCPD with the American College of Radiology.

G-14 Ad Hoc Committee on EPA Occupational Exposure Standards (TERMINATED)

G-15 Liaison - EPA: Nonionizing Public Exposure

1. To represent the CRCPD on the EPA working group on the

development of guidelines for public exposure to nonionizing radiation.

G-16 Calibration Laboratory Review Committee (Combined under G-2.)

G-17 Liaison - American Association of Physicists in Medicine (AAPM)

1. To represent the CRCPD on the AAPM Task Force to develop measurement and evaluation protocol for diagnostic medical radiograph and fluoroscopic and dental radiographic systems.

G-18 Committee on Public Information

1. To provide guidance in the development of public information programs for states, when requested, and to provide testimony to state legislatures and others, also upon request.

G-19 Liaison - Association of State and Territorial Health Officers (ASTHO): Food Irradiation

1. To represent the CRCPD on ASTHO's Committee on Food Irradiation.

G-20 Committee on Licensing State Designation

1. To develop criteria which can be used to make final determination of a non-Agreement State's program for the control and regulation of NARM, for designation as a "Licensing State."
2. To perform surveys, using the established criteria, of those non-Agreement States which have requested final determination as a "Licensing State" for the control and regulation of NARM.
3. For Agreement States, to review data and information, as required by the adopted policy, for final designation as a "Licensing State" for the control and regulation of NARM.
4. To recommend to the Executive Board, those states, either Agreement or non-Agreement, which should be designated as "Licensing State" for the control and regulation of NARM.
5. Quarterly update the Conference membership on the status of CRCPD Recognized NARM Licensing States.

G-21 Liaison - Joint Commission on Accreditation of Hospitals (JCAH)

G-22 Liaison - ANSI: C-95

1. To serve as the CRCPD liaison with the ANSI C-95 Committee which is responsible for establishing safety standards and/or guides for nonionizing radiation.

G-23 Committee on Data Management

1. To describe existing state and Federal computer resources by:
   a. compiling an inventory of computer systems, including hardware and software;
   b. identifying software of general utility and interest; and
   c. identifying system requirement.
2. To determine requirements for software exchange by:

a. determining compatibility of available public domain software;
b. suggesting standards to facilitate transfer ability of programs and data; and
c. identifying alternate hardware and operating systems compatible with suggested standard.

3. To serve as CRCPD clearinghouse for program exchange.

G-24 State Program Staff Retention

1. Determine the various costs to states as a result of elevated staff turn-over rates, including monitoring and quality of staff considerations.
2. Determine the reasons for such turn-over and suggested adjustments or corrections, including the conduct of salary surveys and instability of programs (administration and funding).
3. During development of items one and two, input and participation shall be sought through the General Council Chairman (the CRCPD Chairman-Elect) from the National Conference of State Legislators, the National Governors' Association, and other appropriate entities.

G-25 By-laws Revision Committee (TERMINATED)

G-26 Health Physics Committee - Liaison (Combined under G-2.)

G-27 Committee on NRC Agreement States

1. To provide liaision and communication between the CRCPD and the Association of NRC Agreement States.

G-28 Liaison - American College of Medical Physics

1. To represent the CRCPD as the liaison to the American College of Medical Physics.

History of NARM Issue

The need to uniformally regulate Naturally Occurring and Accelerator Produced Radioactive Material (NARM) has been identified by various states, especially those states which have agreements with the Nuclear Regulatory Commission. The need for uniform control of NARM was identified by several states in the mid 60's.

In 1974, the issue was formalized by a request of the Agreement States to the NRC (then AEC) to bring NARM under jurisdiction of the Commission.

In 1975, members of the Executive Board of the Conference of Radiation Control Program Directors, Inc. (CRCPD), met with NRC Commissioners, and in that meeting identified the problems associated with NARM, and requested the NRC to take appropriate action to place NARM under the Commission's jurisdiction.

At the Annual Meeting of the CRCPD in May of 1985, the membership adopted a formal position on the NARM issue. This formal position, which included suggested wording for amending the Atomic Energy Act to allow NRC control of NARM, was submitted to the NRC immediately following the 1985 meeting. A copy of this "Position Paper" adopted May 20, 1985, is shown on Attachment 1.

Since the adoption of this formal position paper, the Executive Board appointed a special Ad Hoc Committee to revise the position paper to reflect more current views as such were obtained, or changes in federal actions were taken. The latest revision of this position paper was August, 1987, which was transmitted to Harold Denton, under cover letter dated August 26, 1987, from Conference Chairman T.R. Strong. This revised position paper is shown in the "CRCPD NARM Position Section" of this document.

The response to these recommendations by NRC. are reflected in NUREG-1310.

One significant action taken regarding the NARM issue, was the institution of a program by CRCPD to recognize those states which have an adequate program to regulate and control NARM. This program, which was adopted by CRCPD in August of 1983, provides a mechanism for any state, either Agreement or Non-Agreement, to be recognized by the CRCPD, as having a program which is adequate to protect the public health and safety from exposure of radiation from NARM discrete sources. To receive such recognition, the state must request recognition, and must meet the criteria approved by the Executive Board. See the Attachment 2 for this criteria.

Although this mechanism has been in place for almost five years, only twelve states have been so recognized by the CRCPD, and all of these are NRC Agreement States. Since the program is voluntary, it

appears that most states will not request CRCPD recognition. Therefore, this mechanism is failing to produce the desired uniform regulation of NARM, as intended.

POSITION PAPER
on
NRC REGULATORY CONTROL of NARM

Introduction:

The Atomic Energy Act of 1954, as amended, authorizes the U.S. Nuclear Regulatory Commission to control the manufacture, transfer, import, export, use and disposal of specifically identified radioactive materials. These radioactive materials are Byproduct, Source, and Special Nuclear Materials in quantities not sufficient to form a critical mass. The Act does not provide for the regulatory control of Naturally Occurring and Accelerator-Produced Radioactive Material (NARM).

NARM has the same type radiation emissions as the radioactive materials identified in the Atomic Energy Act, and poses a similar threat to the public health and safety. Due to these similar radiation characteristics and the potential threat to the public health and safety, NARM should be controlled in a similar manner as radioactive materials regulated by the Atomic Energy Act.

Characteristics of NARM:

For clarification, the radioactive materials under consideration by this paper, and the materials proposed to be added to the Atomic Energy Act, are discreet sources, and are not intended to include diffuse sources of NARM, such as phosphate residues and slag.

One example of a radioactive material in the category called "NARM" includes radium, which has a relatively long half-life (1600 years), and because of its radiation emissions and deposition in the bone of the body, represents one of the largest potential public health impacts due to its use and biological effects.

NARM is used in every state in the U.S. in the areas of medicine (diagnostic nuclear medicine imaging where the NARM radionuclide is injected into a patient and in therapeutic applications in the treatment of cancerous tumors where NARM sealed sources are used to treat the tumor). NARM is used in industry (incorporated as an integral part of gauges which are used as level indicators and measuring devices) and in the academic fields (used in University teaching programs in such fields as physics, biology and medicine).

Radioactive waste disposal is associated with the use of NARM. Radioactive wastes generated from the use of

radioactive materials identified in the Atomic Energy Act are controlled by this same Act. However, wastes generated by the use of NARM are not controlled by the Act.

New low-level radioactive waste burial sites will be opened in the future. Some of these sites may be in states not regulated by the Nuclear Regulatory Commission. It is imperative that the proper disposal of NARM be ensured in order that the public be protected.

Present Control of NARM:

Several states have established programs for the control of NARM. These programs vary in their degree of regulatory responsibility and control.

The Atomic Energy Act provides for states to assume certain regulatory control of radioactive materials specified in the Act. Twenty-seven states have Agreements with the NRC for the control of certain radioactive materials, as allowed under the Act. The NUREG-0976 document, dated 10/84, and prepared by the staff of the Office of State Programs, NRC, concludes that these NRC Agreement States regulate and control NARM in the same manner as materials identified in the Atomic Energy Act.

However, NUREG-0976 concludes that states which have not entered into an Agreement with the NRC, have differing regulatory authority and control over NARM. Of the twenty-three non-NRC Agreement States, the NUREG document states that five states have a NARM licensing program, two states have voluntary or partial licensing programs, and sixteen states have at least an initial registration requirement for NARM.

In addition, NUREG-0976 indicates that fourteen non-NRC Agreement States have inspection programs, four states conduct partial inspections, and five states do not conduct NARM inspections.

The NUREG document further states, "fragmentary controls, or in some jurisdictions a total lack of control over NARM, pose a potential threat to public health and safety."

NARM and RCRA:

The EPA, under The Resource Conservation and Recovery Act (RCRA) exempts material covered under the Atomic Energy Act. However, the EPA's control over NARM, since it is not covered in the Atomic Energy Act is uncertain. EPA has not developed standards relative to NARM for waste burial sites. Unless a clear agreement or Memoranda of Understanding is developed between NRC and EPA, a dual Federal regulatory

authority of low-level radioactive waste sites would arise. The radioactive material covered in the Atomic Energy Act would fall under the NRC authority and NARM would fall under EPA authority.

Since NRC and EPA have different regulatory approaches to the design of burial sites, site operators and waste generators would be faced with the potential of having to meet the regulatory standards of two different Federal agencies. As the situation now exists, it is uncertain how the two federal agencies will deal with the potential dual regulation in non-NRC Agreement States.

NARM and CERCLA:

The Congress has provided authorization to the U.S. Environmental Protection Agency to "clean-up" areas contaminated by hazardous substance. This authority is provided under the Hazardous Substance Response Trust Fund, established under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980. Some areas and facilities which have been contaminated with NARM have received funding for "cleanup" under this Act.

A question has been raised, that if the Atomic Energy Act is amended to include NARM, would such amendment affect or restrict the use of CERCLA funds for NARM contaminated areas or facilities. Therefore, to clarify this question, a new section is proposed to the Act which would allow the continuation of such funding for NARM contaminated areas and facilities.

Other Studies and Opinions:

In addition to the position of NRC staff regarding the need for better regulation of NARM, as referenced above, other organizations and groups have taken similar positions.

(1) The NRC Agreement States, following their October 1974 meeting recommended that NRC should bring NARM under its regulatory authority.

(2) The Conference of Radiation Control Program Directors, Inc. (CRCPD), in a May 8, 1975 letter to then Commissioner Kennedy, stressed the need for NARM to be regulated at the Federal level.

(3) A Task Force established by NRC in 1976 to study the NARM issue, recommended that NRC seek legislative authority to regulate NARM.

(4) The National Governors' Association, in its publication, The Agreement State Program: A State Perspective, dated January 1983, states, "The Atomic

Energy Act should be amended to authorize the regulation of radioactive materials not presently affected by the act, that is, naturally occurring and accelerator-produced radioactive material (NARM).

(5) A Survey of the states by the NRC (NUREG-0976) showed that all twenty-seven Agreement States, and sixteen of the twenty-three Non-Agreement States, supported the regulation of NARM by NRC. Of the remaining seven, only four were opposed to NRC regulating NARM, with two undecided, and one with no reply.

(6) At the October 1984 meeting of the NRC Agreement States, a resolution was adopted which called upon the NRC to include NARM under the Atomic Energy Act (see attached for copy of resolution).

CONFERENCE POSITION

The Conference of Radiation Control Program Directors, Inc., (CRCPD) has evaluated the NARM situation in the United States and has concluded that the use of NARM is commonplace and widespread throughout the country, and that the degree of control over NARM is quite varied and fragmented. This fragmentary control of NARM creates confusion on the part of the users and waste generators, and creates a real potential for excessive radiation exposure to both the radiation worker and the general public.

Based on the information contained in this paper, the members of the CRCPD, recommend that the Congress of the United States amend the Atomic Energy Act of 1954 to authorize the Nuclear Regulatory Commission to regulate and control discrete sources of Naturally Occurring and Accelerator-Produced Radioactive Material (NARM) in a similar manner as other radioactive material identified in the Act.

The members of the Conference further conclude that there are some non-NRC Agreement state radiation control programs for the regulation and control of NARM that are adequately protecting the public.

Based on this conclusion, we recommend that should the Act be amended to authorize NRC to regulate NARM, NRC must establish procedures to maintain the continuation of a NARM regulatory program in a non-NRC Agreement State that has demonstrated compatible regulatory authority and control of NARM.

In addition, since the twenty-seven NRC Agreement states control and regulate NARM in the same manner as material currently identified in the Atomic Energy Act, the NRC Agreement State members request NRC to establish procedures

to maintain the continuation of NARM regulatory authority and control immediately following amendment of the Act.

Finally, the members of the Conference recommend a proposed amendment to the Atomic Energy Act, and further recommend that the Executive Board transmit this proposed amendment to the National Governors' Association (NGA), with the request that the NGA adopt this proposed amendment.

It is further recommended that the NGA take the necessary action to have Congress consider the proposed amendment, and that the CRCPD provide assistance where necessary to provide sponsorship.

Adopted May 20, 1985

Executive Secretary

SUGGESTED AMENDMENT
for
The ATOMIC ENERGY ACT of 1954
to
AUTHORIZE the U.S. NUCLEAR REGULATORY COMMISSION
to REGULATE
NATURALLY-OCCURRING & ACCELERATOR-PRODUCED RADIOACTIVE
MATERIAL (NARM)

The following suggested changes in the Atomic Energy Act would authorize the U.S. Nuclear Regulatory Commission to regulate and control Naturally Occurring & Accelerator-Produced Radioactive Material (NARM) in a similar manner as radioactive material currently authorized by the Act.

Note: Bracketed word or words indicate the word (s) are to be deleted. Underlined word or words, indicate new word (s) are to be added.

1. Ref: Chapter 2, Section 11 e.

Add a new (3) with the following wording:

e. The term "byproduct material" means (1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, [and] (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, and (3) naturally occurring or accelerator-produced radioactive material (NARM) that is produced, or concentrated for the use of its radioactive properties.

2. Ref: Chapter 2, Section 11

Add a new definition to read as follows, then re-alphabetize appropriately:

The term "naturally occurring radioactive material" means a material or substance that is radioactive as it exists in nature.

3. Ref: Chapter 2, Section II

Add a new definition to read as follows, then realphabetize appropriately:

The term "accelerator-produced radioactive material" means a material or substance made radioactive by exposure to the radiation or a particle accelerator.

4. Ref: Chapter 2, Section II

Add a new definition to read as follows, then realphabetize appropriately:

The term "particle accelerator" means any machine capable of accelerating electrons, protons, deuterons, or other charged particles in a vacuum, and of discharging the resultant particulate or other radiation into a medium at energies usually in excess of 1 MeV.

5. Ref: Chapter 14

Add a new Section to read as follows, then re-number appropriately:

The Commission shall, on January 1, 1992, assume regulatory responsibility for the regulation and control of byproduct materials as defined in Section 11 e (3) and shall by this date have established rules, regulations, and standards to govern the possession and use of byproduct materials as defined in Section 11 e (3).

Prior to January 1, 1992 any reference made to byproduct materials, when a specific type of byproduct materials is not mentioned, shall mean byproduct materials as defined in Section 11 e (1) and (2). On January 1, 1992 and thereafter, any references made to byproduct materials, when a specific type of byproduct materials is not mentioned, shall mean byproduct materials as defined in Section 11 e (1), (2) and (3).

6. Ref: Chapter 19, Section 274b.

Add a new sub-item (3) with the following wording, and re-numbering as appropriate.

b. Except as provided in subsection c., the Commission is authorized to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission under chapters 6, 7, and 8, and section 161 of this Act, with respect to any one or more of the following materials within the State-

(1) byproduct materials as defined in section 11 e. (1);

(2) byproduct materials as defined in section 11 e. (2);

(3) byproduct materials as defined in Section 11 e (3);

[(3)] 4 source materials:

[(4)] 5 special nuclear materials in quantities not sufficient to form a critical mass.

7. Ref: Chapter 19, Section 274

Add a new subsection to read as follows, and re-alphabetize as appropriate.

The Commission shall on January 1, 1992 assume responsibility for the regulation and control of byproduct materials as identified in subsection b (3) of Section 274. No agreement pursuant to byproduct materials as identified in subsection b (3) of Section 274 shall become effective prior to January 1, 1992.

Agreements entered into prior to January 1, 1992 pursuant to byproduct materials as identified in subsection b (1) of Section 274 shall as of January 1, 1992 be deemed to also include byproduct materials as identified in subsection b (3) of Section 274 unless the Commission determines to the contrary based on public health and safety considerations, or unless the State which has entered into such an agreement prior to January 1, 1992 determines that it does not desire regulatory authority over byproduct materials as identified in subsection b (3)of section 274.

The Commission shall establish a procedure to maintain the continuation of regulatory authority for those materials identified in subsection b (3) or section 274 in a state which has not entered into an agreement prior to January 1, 1992.

8. Ref: Chapter 19, Section 274

Add a new subsection to read as follows, and re-alphabetize as appropriate.

Agreements entered into pursuant to subsection b shall not exclude states from being eligible for the assertion of claims against the Hazardous Substance Response Trust Fund established under

the Comprehensive Environmental Response Compensation and Liability Act of 1980 when such claims relate to any of the materials included in the agreements.

CRCPD LS-4
Rev. 4/28/87
Approved by the
Executive Board
5/16/87

REVISED CRITERIA for FINAL DESIGNATION as a CRCPD RECOGNIZED NARM LICENSING STATE (Effective January 1, 1987)

1. The licensing agency must have legislative authority to regulate and control NARM.

2. The licensing agency must have adopted regulations that are compatible with those contained in the Suggested State Regulations for the Control of Radiation (SSRCR) that specifically address areas relating to NARM. Those sections of the SSRCR, which are mandatory for final designation are:

   Section A.1
   Section A.2 as identified:
   - "Accelerator-produced material"
   - "Act"
   - "Agency"
   - "Airborne radioactive material"
   - "Airborne radioactivity area"
   - "Calendar quarter"
   - "Calibration"
   - "CFR"
   - "Curie"
   - "Dose"
   - "Dose commitment"
   - "Exposure", and appropriate footnote
   - "Exposure rate"
   - "Healing arts"
   - "High radiation area"
   - "Human use"
   - "Individual"
   - "Inspection"
   - "Interlock"
   - "License"
   - "Licensee"
   - "Licensing State"*
   - "Major processor"
   - "NARM"
   - "Natural radioactivity"
   - "Occupational dose"

*The current definition of Licensing State, in SSRCR, will be revised to emcompass this program.

- "Particle accelerator"
- "Person"
- "Personnel monitoring equipment"
- "Pharmacist"
- "Physician"
- "Rad"
- "Radiation"
- "Radiation area"
- "Radiation safety officer"
- "Radioactive material"
- "Radioactivity"
- "Registrant"
- "Registration"
- "Regulations of the U.S. Department of Transportation"
- "Rem", and appropriate footnote
- "Research and development"
- "Restricted area"
- "Roentgen"
- "Sealed source"
- "Source of radiation"
- "Special form" (as used in SSRCR D.207)
- "Survey"
- "Test"
- "These regulations"
- "Transport group"*
- "Unrestricted area"
- "Waste handling licensee"
- "Worker"

Section A.3(a)
Section A.4
Section A.5
Section A.6
Section A.7
Section A.8
Section A.9
Section A.10(a)
Section A.11
Section A.12
Part A, Appendix A,* limited to those radionuclides listed in Attachment LS-4
Part A, Appendix B*
Section C.1, and appropriate parts of appropriate footnote
Section C.4(a) and (b)
Section C.4(c)(1)(i)(h)
Section C.4(c)(2)(ii)
Section C.4(c)(3)(i) and (iii)
Section C.20
Section C.22(d), including the associated footnote
Section C.22(f)
Section C.22(g)(3) and (4)

*Regulations of RAM transportation which conform with the draft of SSRCR-Part T satisfy these requirements.

Section C.22(g)(5)(i), as pertaining to radium-226
Section C.22(g)(5)(ii)(b)
Section C.22(g)(5)(iii) through (v)
Section C.22(g)(6), as pertaining to radium-226
Section C.22(h)(1)(ii), (iii), and (v), including the associated footnotes
Section C.22(h)(2)
Section C.22(h)(3)(i)(b) and (c)
Section C.22(h)(3)(ii) through (v)
Section C.22(h)(4) and (5)
Section C.22(i)(1)(ii) and (iv), including associated footnote
Section C.22(i)(2)
Section C.22(i)(3)(i) through (iv)
Section C.22(i)(4)(i)
Section C.22(i)(4)(ii)(b)
Section C.22(i)(5) and (6)
Section C.24
Section C.25(a) through (d)
Section C.26, except reference to by-product materials
Section C.28(a) through (c), except reference to by-product materials, and except for footnote on page C38
Section C.28(d)(1)(i) and (ii)
Section C.28(d)(1)(iii)(a), (b), and (c)(2), including appropriate footnote
Section C.28(d)(2) and (3)
Section C.28(d)(4)(i) through (iii)
Section C.28(d)(4)(iv)(a) through (c), and (e)
Section C.28(f)
Section C.28(g)(1) and (2)(ii)
Section C.28(h)(1) and (2)(ii)
Section C.28(h)(3) and (4)(ii)
Section C.28(h)(5), except reference to by-product materials
Section C.28(j) through (l), including appropriate footnote
Section C.30
Section C.31
Section C.32
Section C.33
Section C.34
Section C.35
Section C.37
Section C.40(a) and (b)(1), (3), (4), and (5), with appropriate footnote
Section C.40(c) and (d)
Section C.50
Section C.90(b)
Section C.100*
Section C.101*
Section C.102,* with appropriate footnotes
Section C.103*

*Regulations of RAM transportation which conform with the draft of SSRCR-Part T satisfy these requirements.

Part C, Appendix A, limited to those radionuclides listed in Attachment LS-4
Part C, Appendix B, limited to those radionuclides listed in Attachment LS-4
Part C, Appendix C, limited to those radionuclides listed in Attachment LS-4
Section D.1
Section D.101 through D.107, and all appropriate footnotes
Section D.201 through D.207, and all appropriate footnotes, but not including reference to by-product materials
Section D.301 through D.305, except reference to by-product materials
Section D.401 through D.408, and appropriate footnotes
Part D, Appendix A, limited to those radionuclides listed in Attachment LS-4
Part D, Appendix B, Limited to those radionuclides listed in Attachment LS-4
Section G.1
Section G.2 for "Brachytherapy"
Section G.3
Section J.1
Section J.11
Section J.13 through J.17
Section W.1 through W.4
Section W.101 through W.104
Section W.105(a) through (d)
Section W.105(e)(2) through (5)
Section W.106 through W.110
Section W.201 through W.203
Section W.301 through W.304
Section W.401 through W.403
Section W.501
Section W, Appendix A

There are no recommended sections of the SSRCR's for consideration in final designation as a Licensing State.

3. The licensing agency should have a radiation control program which is compatible with the criteria contained in the document, "Criteria for Adequate Radiation Control Program - Radioactive Materials," published by the CRCPD in November, 1982.

4. If a NRC Agreement State, a copy of the letter from the last review of the program by the NRC which states that the radiation control licensing program is adequate to protect the public health and safety, must be submitted.

5. If a NRC non-Agreement State, the radiation control program must meet the requirements for a comprehensive radiation regulation and control program contained in the CRCPD document, "Basic Criteria for Site Evaluation of a Radiation Control Program to Regulate and Control NARM." The determination of meeting this basic criteria will be obtained by an on-site visit and evaluation by the Licensing State Review Committee.

6. A written statement by the health officer, or equivalent agency head, that the radiation control program under consideration meets the requirements #1, 2, and 3 and is adequate to protect the public health and safety from exposure to NARM radiations.

Attachment LS-4
Rev. 4/28/87
Approved by the
Executive Board
5/16/87

RADIONUCLIDES that must be SPECIFICALLY ADDRESSED
in REGULATIONS of CRCPD RECOGNIZED LICENSING STATE

Element	Radionuclide(s)
Actinium	Ac-227, Ac-228
Arsenic	As-73
Beryllium	Be-7
Bismuth	Bi-210, Bi-212
Carbon	C-14
Cesium	Cs-131
Cobalt	Co-57, Co-58
Fluorine	F-18
Germanium	GE-68
Gold	Au-195
Hydrogen	H-3
Iodine	I-123, I-124, I-125, I-126
Iridium	Ir-190
Lead	Pb-203, Pb-210, Pb-212
Magnesium	Mg-28
Manganese	Mn-52
Mercury	Hg-197
Phosphorus	P-32
Platinum	Pt-193m
Polonium	Po-210
Praseodymium	Pr-143

Protactinium	Pa-231
Radium	Ra-223, Ra-224, Ra-226, Ra-228
Radon	Rn-220, Rn-222
Rhenium	Re-187
Rubidium	Rb-87
Samarium	Sm-147
Sodium	Na-22
Strontium	Sr-87m
Sulfur	S-35
Technetium	Tc-97m
Thallium	Tl-201
Yttrium	Y-87/Sr-87, Y-88

CRCPD LS-5
Rev. 4/28/87
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Executive Board
5/16/87

BASIC CRITERIA for SITE EVALUATION of a RADIATION CONTROL PROGRAM to REGULATE and CONTROL NARM

The following criteria will be applied during the site visit and evaluation of the radiation control program of a state, usually a NRC non-Agreement State, for the determination that the program meets the general policy statements for the protection of the public health and safety from the possession and use of NARM within the state.

The results of the findings during a site visit shall be one component, but not the only factor, in determining the final designation of a state as a "CRCPD Recognized NARM Licensing State." See CRCPD LS-4, effective January 1, 1987 for the other requirements.

As a result of the findings of a site review, the Site Review Team will make one of the following determinations:

1. the state's radiation control program is adequate to protect the public health and safety, as related to NARM; or
2. the state's radiation control program is inadequate to protect the public health and safety, as related to NARM.

A program may be adequate to protect the public health and safety, although in need of improvement in specific areas. In some cases, the Site Review Team may be unable to make a finding at the time of the site visit because of unresolved items or inadequate information necessitating a follow-up site visit, or through additional correspondence with the state under consideration. If the unresolved items cannot be settled within a reasonable time, the Site Review Team may make a third determination:

3. the Site Review Team is unable to make a finding due to unresolved items or inadequate information.

Certain aspects of a program are critical to the protection of the public health and safety from NARM. For example, a state does not have qualified personnel, fails to take adequate licensing actions, or has no inspection program, would not be considered to have a program adequate to protect the public health and safety.

Two separate categories shall be used in the basic criteria for program adequacy. Category I items are those items which shall be properly in place to meet the general policy statements. Category II items are recommended items which should be in place, but are not mandatory to meet the general policy statements.

Category I indicators are:

- Legal Authority
- Status and Compatibility of Regulations
- Quality of Emergency Planning
- Technical Quality of Licensing Actions
- Adequacy of Product Evaluations
- Status of Inspection Program
- Inspection Frequency
- Inspector's Performance
- Response to Actual and Alleged Incidents
- Enforcements Procedures

Category II indicators are:

- Updating of Regulations
- Location of Radiation Control Program Within State Organization
- Internal Organization of Radiation Control Program
- Legal Assistance
- Technical Advisory Committee
- Budget
- Laboratory Support
- Administrative Procedure
- Management
- Office Equipment and Support Services
- Public Information
- Qualifications of Technical Staff
- Staffing Level
- Staff Supervision
- Training
- Staff Continuity
- Licensing Procedures
- Inspection Procedures
- Inspection Reports
- Independent Measurements

If all Category I items are found to be adequate, then this will indicate that the program is adequate to protect the public health and safety.

For those Category II deficient items, the state will be informed of the finding, and requested to correct these deficient items, but such deficient items will not constitute a reason to deny final designation.

Categories

I. Enabling Legislation

Category I

A state shall have enabling legislation essentially in conformity with the Council of State Governments "Suggested State Legislation", 1983 edition, Volume 42. Such legislative authority shall include authority to promulgate regulations to license, inspect, and enforce NARM.

NOTE: For NRC Agreement States, legislative authority previously accepted by the NRC will be accepted by the Site Review Team.

Category II

The State should have legislative authority to (1) set licensing fees, (2) formulate requirements for surety arrangements, (3) issue civil penalties, and (4) appoint advisory committees.

II. Regulations

Category I

The state shall have promulgated regulations which meet the specific sections of the "Suggested State Regulations for the Control of Radiation" (SSRCR) - Volume II, Ionizing, item 2 of CRCPD LS-4, effective January 1, 1987.

Category II

All regulations should be reviewed every three years with revisions adopted within one year thereafter.

III. Program Organization

Category II

1. The Radiation Control Program (RCP) responsible for the regulations and control of NARM should be identifiable unit within the state organization.
2. Where regulatory responsibilities are divided between state (and other governmental) agencies, clear, written understandings should exist as to the division of responsibilities and requirements for coordination.
3. The RCP director should have access to appropriate levels of agency management.
4. Technical committees, federal agencies, and other resource organizations should be used to extend staff capabilities for unique or technically complex problems.

5. Legal staff should be identified to assist the RCP or procedures should exist to obtain legal assistance expeditiously. Legal staff should be knowledgeable regarding the RCP program, statutes, and regulations.

IV. Program Planning

Category II

The activities of a RCP should be guided by a written overall plan which follows the planning procedures contained in the CRCPD Publication 82-2, Section III, page 4. The plan should have measurable indices such as number of inspections performed, etc.

V. Management

Category II

1. The RCP management should periodically assess workload trends, resources and changes in legislative and regulatory responsibilities to forecast needs for increased staff, equipment, services and fundings.
2. Program management should perform periodic reviews of selected license cases handled by each reviewer and document the results. Complex licenses (major manufacturers, large scope Type A Broad, etc., should receive second party review).

VI. Staffing Level

Category I

The RCP shall be staffed with sufficient trained personnel.

As a guide in determining the sufficiency of trained personnel, personnel requirements for licensing, inspection, and enforcement of NARM licenses should be 1.0 to 1.5 full-time equivalents (FTE) per 100 licenses. For small programs, at least two persons should be assigned responsibility for licensing activities to ensure continuous program coverage and continuity in the event of sickness, promotion, etc.

Definition: full-time equivalent (FTE) - For NARM licensing requirement, one FTE means a technically trained individual who spends 100% of his/her work time in licensing, inspection, and enforcement of NARM licenses. An individual may only spend part of their working time in licensing activities, and in such cases, the percent of one FTE would be applied.

Category II

Staff turnover should be minimized by combination of opportunities for training, promotion, and competitive salaries. Salary levels should be adequate to recruit and retain persons of appropriate professional and technical qualifications. Salaries should be comparable to similar health physics employment in the surrounding geographical area.

VII. Personnel

Category II

Professional Staff

1. Radioactive materials program licensing, inspection and enforcement staff should be experienced. Requirements for training and experience will be different for each state depending upon the types of licenses administered by the state. The following guidance may be used to develop a description of positions:

   a. Supervisor - Senior Level

      Entry level qualifications should include:

      i. a four year degree in science or engineering and supplemental college level training in health physics and public administration;
      ii. specific training in licensing, inspection and enforcement of radioactive materials licensees; and
      iii. at least four years of experience serving in a professional health physics position; or eight years of equivalent training and experience in other civilian or military employment in radioactive materials, plus a record of progressive management responsibility within the position.

   b. Senior Level - Professional/Technical

      Entry level qualifications should include:

      i. a four year degree in science or engineering and course training in basic health physics;
      ii. specific training in licensing, inspection and enforcement of radioactive materials licensees; and
      iii. at least one year progressive experience in the role of a Junior Level Professional/Technical: or eight years as a health physics technical in other governmental, civilian or military employment to radioactive materials.

c. Junior Level - Professional/Technical

Entry level qualifications should include:

i. college level training in mathematics, physics, and chemistry;
ii. two years of progressive training in radiation protection; and
iii. specific training in inspection and enforcement of radioactive materials licensees; or equivalent training and experience in other government civilian, or military training.

2. The supervisor should be part of the management team.

3. Each employee should have an accurate, and up-to-date description of the position, detailing specific responsibilities and tasks.

4. It should be possible for any professional or technical employee to progress via a career ladder through the various levels up to and including Director of the Radiation Control Agency.

5. An organizational structure that supports promotion from within and salary levels adequate to retain persons of appropriate qualifications should be the policy of the agency to minimize staff turnover and maintain continuity.

6. Personnel requirements for licensing, inspection and enforcement of radioactive materials licenses should be 1.0 to 1.5 full-time equivalents per 100 licenses. Additional staff would be required for:

a. A major radioactive materials manufacturing facility.
b. A major milling/processing facility.
c. A low-level commercial waste disposal area.
d. Key emergency response activities.

Training

1. Training should be included in the program plan. This training should encompass initial and on-going training necessary to maintain technical competence and maintain the interest and involvement of new and experience staff. At least 5% of program time should be allocated to training and/or cross training.

2. Training should be planned as available from universities, federal agencies, private companies, etc., to broaden the capability of the staff and to keep personnel informed of current developments in the control of hazards related to radioactive materials.

3. The radioactive materials program should have a planned policy of cycling all professional and technical staff through a variety of training and retraining to periodically update and reinforce previous knowledge.

4. State should use training aids available from federal agencies and develop a comprehensive reference library on radioactive materials and licensing.

5. Interstate training agreements and exchange of information is desirable to utilize state training staff.

VIII. Licensing

Category I

1. The radioactive materials programs shall license users of radioactive materials in accordance with Part C of the SSRCR. The program shall obtain information about the proposed use of radioactive materials, facilities and equipment, training of personnel, radiation safety officer, and operating and emergency procedures appropriate for determining that the licensee can operate safely in compliance with rules and license conditions. Pre-license visits for major licensing actions should be considered.

2. Licenses shall be clear, complete, and accurate as to radionuclides, forms, quantities, authorized uses, and permissive or restrictive conditions.

3. The RCP shall have procedures for reviewing licenses, at least every five years, prior to renewal to assure that supporting information in the file reflects the current scope of the licensed program.

4. Radiation control program evaluation of manufacturer's or distributor's data on sealed sources and devices shall follow the guides contained in "Guides for Naturally-occurring and Accelerator-produced Radioactive Materials (NARM)", HHS Publication FDA 81-8025, June 1981, prepared by the CRCPD. Such evaluations shall be adopted to the format contained in NRC Reg. Guide 10.10, "Guide for the Preparation of Applications for Radiation Safety Evaluation and Registry of Devices Containing Radioactive Materials," March 1987.

NOTE: It is anticipated that all approved sources and devices, including NARM, will be formally recognized in the NRC "Registry of Radioactive Sealed Sources and Devices".

Category II

1. Radioactive materials programs should adopt and use licensing guides, checklists, and policy memoranda in issuing licenses to assure technical quality and uniformity in the licensing program. NRC Guides, American National Standards Institute standards, and the CRCPD, "Radioactive Materials Reference Manual (RMRM) are appropriate for reference.

2. The radiation control program should have internal licensing guides, checklist and policy memoranda. Licenses applicants (including applicants for renewal) should be furnished copies of appropriate guides and regulatory position. The compliance status of licensees should be considered in licensing actions. Radioactive material evaluation sheets, service licenses, and licenses authorizing distribution to general licensees and persons exempt from licensing should be prepared and distributed on a timely basis.

   Standard license conditions should be used to expedite and provide uniformity in the licensing process.

   Files should be maintained in an orderly fashion to allow fast accurate retrieval of information and documentation of discussions and visits.

   Appropriate copies of rules, laws, guides and forms should be printed and made available to each licensee or prospective licensee.

IX. Inspection

Category I

1. The radiation control program shall maintain an inspection program adequate to assess license compliance with state regulations and license conditions.

2. The radiation control program shall maintain statistics which are adequate to permit program management to assess the status of the inspection program on a periodic basis. Information showing the number of inspections conducted, the number overdue, the length of time overdue, and the priority categories shall be readily available.

3. The radiation control program shall conduct at least annual inspection planning to specify the number of inspections to be performed, make assignments to senior versus junior staff, make assignments to regions, if appropriate, identify special needs, and prepare periodic status reports.

4. The radiation control program shall establish an inspection priority schedule. The specific frequency of inspections

shall be based upon the potential hazards of licensed operations, e.g., major processors, broad licensees, and industrial radiographers shall be inspected approximately annually, while smaller or less hazardous operations may be inspected less frequently. The minimum inspection frequency shall be consistent with Table A of CRCPD Publication 82-2, "Criteria for Adequate Radiation Control Programs (Radioactive Materials)", November 1982.

5. Inspectors shall be competent to evaluate health and safety problems and to determine compliance with state regulations. Inspectors must demonstrate to supervision an understanding of regulations, inspection guides, and policies prior to independently conducting inspections.

Category II

1. The compliance supervisor should conduct annual field evaluations of each inspector to access performance and assure application of appropriate and consistent policies.

2. Administrative procedures for conducting inspections should be developed. These procedures should include:
   a. Inspection guides and checklists to maintain uniform compliance procedures. (It is recommended that NRC Agreement State Guides be used as reference in the development of such guides.)
   b. A written policy should establish protocol for announced inspections (announced inspections should not occur except under extenuating circumstances), unannounced inspections, follow-up inspections, exit interviews, notification of violations, and obtaining agreements with licensees on scheduling of corrections.
   c. Procedures should be available for maintaining a sequential record of licensees' compliance history to enable early identification of patterns of repetitive violations.
   d. Inspection reports should be uniform and adequately describe:
      i. scope of inspections;
      ii. complete substantiation of all items of noncompliance;
      iii. scope of licensees' safety programs;
      iv. number and type of inspector's independent measurements; and
      v. follow-up of previous violations.
   e. A reporting system for clearly identifying the need for license changes based on inspections, especially in those states that have separate licensing and inspection staff.

X. Radiation Measuring Capability

Category I

1. The radiation control program radiation measuring instrumentation, or the availability of such instrumentation, shall have the full scope and range to measure the activities of all licenses. Such instruments shall be calibrated at intervals not greater than that required of licensees.

2. The radiation control program shall have the capability, in-house, or readily available through established procedures, for laboratory support to conduct bioassays, analyze environmental samples, analyze samples collected by inspectors, etc., on a priority established by the RCP. Such laboratory shall have a program for assuring quality control.

Category II

The inspection program should include confirmatory measurements and be sufficient in number and type to ensure the licensee's control of NARM and to validate the licensee's field survey measurements.

XI. Enforcement

Category I

Enforcement procedures shall be established to provide a substantial deterrent to licensee noncompliance with regulatory requirements. These procedures shall reflect: 1) methodology for handling escalated enforcement cases of varying degrees, 2) methodology for the modification, suspension, or revocation of licenses; and 3) impoundment of NARM.

Category II

1. Provisions should be available for levying of monetary penalties.

2. Administrative enforcement procedures should specify that enforcement letters be issued within thirty days following inspections and should employ appropriate regulatory language clearly specifying all items of noncompliance and health and safety matters identified during the inspection and referencing the appropriate regulation or license condition being violated. Enforcement letters should specify the time period for the licensee to respond indicating corrective actions and actions taken to prevent recurrence (normally 20-30 days). The inspector and compliance supervisor should review licensee responses.

XII. Incident Response

Category I

1. A general response plan shall be written to enable the state to promptly respond to on-site NARM incidents, NARM transportation accidents, or other NARM accidents and/or incidents.
2. Administrative procedures for incident response shall require that:
   a. Inquiries shall be promptly made to evaluate the need for on-site investigations.
   b. On-site investigations shall be promptly made of incidents requiring reporting to the Agency in less than thirty days. (SSRCR D.403 equivalent)
   c. For those incidents not requiring reporting to the Agency in less than thirty days, investigations shall be made during the next scheduled inspection.
   d. Investigations shall include indepth reviews of circumstances and shall be completed on a high priority basis. When appropriate, investigations should include reenactments and time-study measurements (normally within a few days). Investigations (or inspection) results shall be documented and enforcement action taken when appropriate.
   e. State licensees shall be notified of pertinent information about any incident which could be relevant to other licensed operations (e.g., equipment failure, improper operating procedures).
   f. Information on incidents involving failure of equipment shall be provided to the agency responsible for evaluation of the device for an assessment of possible generic deficiency.
   g. The RCP shall have access to medical consultants when needed to diagnose or treat radiation injuries. The RCP shall use other technical consultants for special problems when needed.

May 5, 1988

LICENSING STATE STATUS

STATE	NO REQ	PROV EXP	PROV EXT	F CONSID	F DENIED	F GRANT
Alabama		x				
Alaska	x					
Arizona		x				
Arkansas	x					
CA:LA Co.	x					
CA:Orange Co.	x					
CA:S. Diego Co.	x					
CA:St. Ind Rel	x					
CA:State Health	x					
olorado						x
Connecticut	x					
Delaware				x		
Dist. of Col.	x					
Florida						x
Georgia Hlth.						x
Hawaii	x					
Idaho		x				
Illinois						x
Indiana	x					
Iowa	x					
Kansas		x				
Kentucky	x					
ouisiana				x		
Maine	x					
Maryland				x		

STATE	NO REQ	PROV EXP	PROV EXT	F CONSID	F DENIED	F GRANT
..assachusetts		x				
Michigan	x					
Minnesota	x					
Mississippi						x
Missouri	x					
Montana	x					
Nebraska	x					
Nevada		x				
New Hampshire		x				
New Jersey	x					
New Mexico		x				
North Carolina		x				
North Dakota						x
NY City Hlth.		x				
NY Envir.	x					
NY Health		x				
NY Labor			x			
Ohio	x					
Oklahoma	x					
Oregon						x
Pennsylvania	x					
Puerto Rico	x					
Rhode Island						x
South Carolina		x				
South Dakota	x					
ennessee						x
Texas						x
Utah						x
Vermont	x					

STATE	NO REQ	PROV EXP	PROV EXT	F CONSID	F DENIED	F GRANT
Virginia		x				
Washington						x
West Virginia	x					
Wisconsin	x					
Wyoming	x					

NO REQ = No request for designation received.

PROV EXP = Provisional designation status expired.

PROV EXT = Provisional designation status extended.

F CONSID = Final designation under consideration.

F DENIED = Final designation request denied.

F GRANTED = Final designation as a "CRCPD Recognized NARM Licensing State" granted.

NARM Status
in the
States

The regulation and control of Naturally Occurring and Accelerator Produced Radioactive Material (NARM) in the United States is not uniformally performed. Of the twenty-nine states which have Agreements with the NRC, all manage NARM in a similar manner as By-product material. Of the non-Agreement states, the regulation and control of NARM is generally very poor. Of the twenty-one non-Agreement States, four license the use of NARM (Delaware, New Jersey, Pennsylvania, and Virginia). Of the remaining seventeen states, all but one (Montana), register NARM. Of the sixteen that register, four have a program that is similar to licensing, in that an application is required, and the training and experience of the user and the radiation safety program is considered prior to the issuance of a registration certificate. The remaining twelve states register NARM similar to the registration of x-ray machines, i.e., the user simply advises the agency of the possession of the NARM source, then a certificate of registration is issued.

Of the twenty-one non-Agreement states, six have no regulations adopted that address NARM.

The major problem in the regulation and control of NARM in these non-Agreement states is in the area of inspection and enforcement of radiation protection standards. Based on information from a telephone survey of the non-Agreement states, during the week of April 25, 1988, nine states were given a very poor rating relative to their inspection and enforcement program. Some states indicated they have never inspected NARM users, while others indicated inspections were very rare, in many cases at intervals exceeding six years or more. For many states, the NARM inspection program is tied to their x-ray inspection program, so the priority of NARM inspection is based on the x-ray machine priorities. Of the remaining twelve states, three have poor inspection/enforcement programs, leaving only nine with good to excellent programs. In summary, of the twenty-one non-Agreement states, nine have good to excellent inspection programs, but twelve have poor to very poor programs. In these twelve states public health and safety is being compromised. Strong regulation and control are needed in these twelve states.

Several states indicated that even if they had a strong inspection program, they had "no teeth" in their regulations to require compliance.

During the recent survey of the non-Agreement states, the question was again asked if their states would have any objections to NRC regulation of NARM within their state. Of the twenty-one non-Agreement states, only one indicated objection. This single

objection was based on the feeling that the NRC would probably not do any better job than that state was doing to regulate and control NARM.

The one condition of no objections from the surveyed states was, that those states which do have a good to excellent NARM regulatory program, that they would be allowed to continue their state control under some type agreement with the NRC. Some favorable comments regarding NRC regulation of NARM were:

1. "I would welcome NRC control."
2. "I certainly wish they would."
3. "Has been needed for a long time."

The attachment shows the results of the survey conducted during the week of April 25th.

Attachment

RESULTS OF TELEPHONE SURVEY
OF
NON-AGREEMENT STATES
DURING WEEK OF APRIL 25, 1988

STATE	LEGISLATIVE AUTHORITY TO REGULATE NARM	ADOPTED REGULATIONS TO REGULATE NARM	LICENSE NARM	REGISTER NARM	INSPECTION PROGRAM RATING*	ENFORCEMENT PROGRAM RATING*
Alaska	Yes	Yes	No	Yes	Very Poor	Very Poor
Connecticut	Yes	No	No	Yes	Very Poor	Very Poor
Delaware	Yes	Yes	Yes	No	Good	Good
Hawaii	Yes	No	No	Yes	Very Poor	Very Poor
Indiana	Yes	Yes	No	Yes	Very Poor	Very Poor
Maine	Yes	Yes	No	Yes	Excellent	Excellent
Massachusetts	Yes	No	No	Yes	Very Poor	Very Poor
Michigan	Yes	Yes	No	Yes	Poor	Poor
Minnesota	Yes	Yes	No	Yes	Very Poor	Very Poor
Missouri	Yes	Yes	No	Yes	Excellent	Excellent
Montana	Yes	Yes	No	No	Very Poor	Very Poor
New Jersey	Yes	Yes	Yes	No	Excellent	Excellent
Ohio	Yes	Yes	No	Yes	Excellent	Excellent
Oklahoma	Yes	Yes	No	Yes	Good	Good
Pennsylvania	Yes	Yes	Yes	No	Excellent	Excellent
South Dakota	Yes	No	No	Yes	Very Poor	Very Poor
Vermont	Yes	No	No	Yes	Poor	Poor
Virginia	Yes	Yes	Yes	No	Excellent	Excellent
West Virginia	Yes	Yes	No	Yes	Poor	Poor
Wisconsin	Yes	Yes	No	Yes	Good	Good
Wyoming	Yes	No	No	Yes	Very Poor	Very Poor
Totals	21 Yes	15 Yes	4 Yes	16 Yes		

*NOTE: The rating was arbitrarily given by the Executive Secretary based on the frequency of inspection and level of enforcement. As stated on the next page, there are a variety of reasons why state programs have ranked poor to very poor. Additionally, although the inspection/enforcement program may rank poor to very poor, other components of these state's NARM activities are good to excellent, as identified.

General Statements
on
State's Regulation of NARM

The previous table has identified twelve states which have a poor to very poor rating for their inspection/enforcement programs. The major cause for these ratings is a lack of resources to perform the needed service, not a lack of concern on the part of the radiation control programs. Many, if not most, state radiation control programs have limited resources to perform a multitude of duties. These duties include radiation protection activities in x-ray, environmental monitoring and surveillance, emergency response to radiation accidents or incidents, radon in homes, and for many states, protection services in the nonionizing area.

Most of the states with poor to very poor ratings, will respond to NARM accidents, and in some states, such as Minnesota, NARM sources that are frequently used, are inspected frequently.

Also, for some states, such as Massachusetts, although the users of NARM are not frequently inspected, newly manufactured NARM sources are evaluated in a timely manner.

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS, INC.

August 26, 1987 RECEIVED AUG 31 1987

Harold R. Denton, Director
Office of Governmental and Public Affairs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

The purpose of this letter is to formally share with you and the Nuclear Regulatory Commission the position of the Conference of Radiation Program Directors on naturally occurring and accellerator produced radioacive material (NARM).

The issue, simply stated, is that NARM radioactive material is not adequately or uniformly regulated in the United States, and as a result, has the potential for significant exposure to the public and for contamination of the environment.

The concern for nonuniform control of NARM has been voiced by state radiation control directors since the early 1960's and has been brought to the attention of the NRC on many occasions over the last several years. This same concern has been expressed by the Agreement States, as a group, and by the Conference of Radiation Control Program Directors, Inc. (CRCPD), which represents both Agreement and non-Agreement states. Let me also draw your attention to the June 26, 1987, letter to Samuel Chalk from Warren Sinclair, President of NCRP, in which Mr. Chalk specifically addresses the NARM issue. A copy is enclosed.

The most recent action on the NARM issue taken by the Conference is the adoption of a "Position Paper on NRC Regulatory Control of NARM," which was approved by the membership at our 1985 annual meeting. The 1985 position has been updated to reflect current concerns. A copy of our position paper is enclosed.

The Conference strongly urges the Nuclear Regulatory Commission to begin the appropriate actions necessary to regulate this hazardous radioactive material in the states which are not currently regulating NARM. It is our belief that because (1) there is no single federal agency where uniform guidance on NARM is provided and that (2) in some states there is no control of NARM, the resulting potential for public health exposure and environmental contamination presents an intolerable situation. We believe a uniform regulatory program operated by the NRC

is the best solution. The details of our rationale for NRC control of NARM is clearly described in our position paper.

The Conference is developing a compilation of recent incidents involving NARM which we will share with you as soon as possible. In the meantime, we believe the position paper adequately describes the need for NRC action.

The Conference is ready and willing to present its position to the Commission as the NARM issue is considered. Please do not hesitate to contact me at (206) 753-3468 or Chuck Hardin, our Executive Secretary, at (502) 227-4543.

Sincerely,

T. R. Strong
Chairman

TRS/db

Enclosure

Revised

August 24, 1987

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS

POSITION PAPER ON

NRC REGULATORY CONTROL OF NARM

Introduction

The Atomic Energy Act of 1954, as amended, authorizes the U.S. Nuclear Regulatory Commission (NRC) to control the manufacture, transfer, import, export, use and disposal of radioactive materials classified as byproduct, source and special nuclear materials. The Act does not provide for the regulatory control by the NRC of naturally occurring and accelerator produced radioactive material (NARM). This 1954 decision to exclude NARM was based on the fact that controlling the radioactive materials associated with weapons development was the nation's only significant concern. Even when the use of NARM became more widespread, this omission was never corrected. Reference 1 (see page 15) has a more complete legislative history on why NARM was never included under the Atomic Energy Act.

NARM represents the same types of public health and safety risks, and in fact includes some of the identical radionuclides, which are regulated by the NRC under the Atomic Energy Act. Due to these similar characteristics, and in order to ensure the adequate protection of the public health and safety, the Conference of Radiation Control Program Directors believe NARM should be controlled in the same way other radioactive materials are regulated under the Atomic Energy Act.

Characteristics and Use of NARM

Most common substances contain small quantities of naturally occurring radioactive materials. For clarification, the radioactive materials proposed to be added the the authority granted by the Atomic Energy Act would (1) be those materials either concentrated in nature as a result of man's activities or deliberately concentrated for their radioactive properties; or (2) discrete sources. Diffuse sources such as phosphate residues, nonuranium ores, and slags are not intended to be included. The NRC would be required to determine which materials pose a potential threat to public health and safety and which should therefore be covered under the Act.

The most common example of NARM is Radium-226. Radium is considered to be one of the most hazardous of all radionuclides for at least two reasons: it has a 1600 year half-life and it decays to the radioactive gas Radon-222. Radium also has one of the lowest allowable concentrations of any radionuclide in water. It has been estimated that about 20 percent of all radioactive material

users possess Radium sources. Between 1912 and 1961, nearly 2,000 grams (2000 curies) of Radium were processed in, or imported into, the United States. A recent survey of all state radiation control programs identified about 130 curies of Radium currently registered. Since less than 200 curies have been disposed in licensed disposal facilities, this may indeed be a significant public health and safety problems, due largely to the inconsistent regulation of NARM. Because Radium is the most common NARM and presents the greatest of potential problems, it will receive most of the attention in the discussion that follows.

There are numerous other radionuclides considered to be NARM (see Reference 1 for specific examples). NARM is used in every state in the United States. In the areas of medicine, NARM is used for applications such as diagnostic nuclear medicine imaging where the radionuclide is injected into the patient, and in therapeutic applications where sealed sources are used to treat cancerous tumors. NARM is used in industry for things like integral parts of gauges, in devices for various measurements, and in the academic field for various research and teaching applications. There is currently estimated to be about 10,000 users and possessors of NARM in the United States. The use of Radium in most applications appears to be declining, thus creating a disposal problem to be discussed later. At the same time, it appears that the use of accelerator-produced radionuclides is growing.

Present Control of NARM

The regulation of NARM is fragmented, nonuniform, and incomplete at both the federal and state levels. Absent a federal mandate, most states have established some sort of program for the control of NARM. However, these programs vary greatly in their degree of regulatory responsibility and control.

The Atomic Energy Act provides for states after they qualify to assume regulatory control for radioactive materials specified in the Act. Twenty-eight states have agreements with the NRC for full regulatory control of certain radioactive materials as allowed under the act. These NRC Agreement States regulate and control NARM in the same way they do for Atomic Energy Act materials for which they have regulatory responsibility and authority.

Those states which have not entered into agreements with the NRC have widely differing regulatory authority and control over NARM,[2] and this is where the major problem lies. Of the twenty-two non-NRC Agreement States, only five have a NARM licensing program. Of the remainder, two states have voluntary or partial licensing programs, while 15 have very limited initial registration requirements. At the same time, the interstate transportation of NARM is covered by uniform U.S. DOT regulations.

In the area of NARM inspections, the regulatory picture is somewhat better[2]. In non-NRC Agreement States, fourteen have inspection programs while four states conduct partial inspections. Five states conduct no NARM inspections.

The Conference of Radiation Control Program Directors (CRCPD) has attempted to correct this nonuniform regulatory control situation at the state level by developing a "NARM Licensing State" qualification program. This program is intended to provide a thorough review of NARM regulatory control in both Agreement and Non-Agreement States using consistent review criteria. It is assumed that a state which has been certified as a "Licensing State" has a program compatible with the requirements of an NRC agreement. Because of this program, and to alleviate the concerns of some states which would not otherwise support the position, it is recommended that an amendment to the Atomic Energy Act provide for recognition of the NARM regulatory programs in those non-Agreement States which do not want to enter into a full agreement. It would be desirable to provide for a mechanism for these states to continue this adequate program without the additional administrative burden of applying for NRC Agreement State status.

The lack of uniform licensing and regulatory control at both the federal and state level has led to a variety of problems which present both potential and real public health and safety threats. Some of these problems are described as follows.

— There have been numerous incident reports dealing with NARM. Most have involved Radium sources. From 1966 to 1969 the Federal Bureau of Radiological Health conducted a voluntary program to document NARM incidents in the states. During this period, there was an average of

twenty-nine incidents per year involving Radium alone, most of which involved loss of the material[1]. Because of nonuniform regulations, this is believed to be an underestimate of the problem. In more recent years, the frequency appears to be decreasing. However, without uniform regulations and the uniform reporting system which this would require, the real threat and impact to public health and safety cannot be determined.

— As with Atomic Energy Act materials, there have also been misadministrations of NARM radiopharmaceuticals. However, these events are not being captured in any national incident reporting system, and lessons learned are not adequately shared.

— The nonuniform state-to-state regulation of NARM creates interstate commerce problems. If a manufacturer in a state with an adequate NARM regulatory program ships NARM sources to a state not regulating NARM, or vice versa, control over how this source will be used can be lost. This has lead some states to deny reciprocal regulatory agreements to states not designated as "Licensing States".

— Where NARM sealed sources and devices containing NARM are manufactured in or distributed from states without adequate NARM control programs, such sources and devices (which can include medical sources) probably have not undergone a regulatory review for adequacy of radiation safety design and manufacturing controls.

— NRC regulations allow for the distribution to the public of very small quantities of radioactive materials contained in consumer products, such as smoke detectors. These materials are called "generally licensed", (i.e., no "specific" license is required), and an evaluation must be performed to show that this general distribution will not result in risks to health and safety. Products that include NARM may not receive adequate evaluation and these consumer products may create health and safety problems.

— Due to the lack of adequate regulatory control, various instruments and devices containing radium have been manufactured in the past for the military without any distribution limitations or markings. Such devices have been found in numerous instances in the public's possession and may have caused significant radiation exposures.

— In non-Agreement States with NARM inspection programs, about 70 percent of the NARM users are also licensed by the NRC to possess and use material[2]. This requires both State and NRC inspectors to inspect the same facility, in many cases duplicating efforts and wasting already limited resources.

— Ensuring the proper disposal of NARM is probably the greatest and most visible problem that has been exacerbated by nonuniform regulation.

Disposal of NARM

Since most accelerator produced radionuclides have relatively short half-lives, they are typically stored on-site for decay and do not present a disposal problem. The exceptions to this may be accelerator targets and other components; however, nonuniform reporting requirements again make data gathering difficult. Therefore, the focus of this section will be on naturally occurring radionuclides, particularly Radium. It should be noted that the proposed Super Collider is estimated to separate from 10,000 to 40,000 cubic feet of LLRW annually, which will be classified as NARM.

One of the major problems with disposal is that although states have made a strong case for it, NARM was not included as a low-level radioactive waste covered by the Low-Level Radioactive Waste Policy Amendments Act of 1985. Like mixed wastes, this material was left as an orphan waste stream. As a result, it is very uncertain how it will be properly disposed. Note that none of the Compact regions has included NARM as a low-level waste for which it must be responsible.

Because Radium is considered by many to be as toxic as transuranic materials, it is currently very difficult to dispose in a licensed low-level radioactive waste disposal site. The Barnwell site will not accept any discrete Radium sources. The Hanford site has imposed limits for disposal of Radium more stringent than are those for transuranics. Although the Beatty site will

accept Radium, other problems beyond the scope of this paper have limited such disposals. Inclusion of NARM under the Atomic Energy Act would require that the NRC include Radium in its waste classification system. Such classification would lead to the setting of uniform standards for acceptance of Radium at the disposal sites. It would also serve to establish a Class C limit for Radium which would specify the assignment of responsibility, either state or federal government, for disposal.

It should be noted that the Conference of Radiation Control Program Directors is in the process of establishing a disposal mechanism for discrete Radium sources. It is hoped that through this program many Radium sources, now being stored because disposal is difficult, can be properly disposed.

It should also be noted that forced Radium storage creates other radiological hazards. Unwanted or unneeded Radium must be stored if disposal in a licensed low-level radioactive waste site is difficult, impractical, or too expensive. Storage requires adequate shielding and proper security. In addition, Radium sources frequently leak and become contaminated.

In addition to sealed sources, there are other discrete Radium contaminated waste which will probably be generated in increasing quantities and require safe disposal. These include clean-up resins from drinking water supplies contaminated with Radium, and scale on piping used for oil and gas collection and transmission which has been discovered to trap relatively large concentra-

tions of Radium. Uniform regulation of NARM will provide assurance that these sources and others will be properly controlled and safely disposed in the future.

NARM and RCRA

The Resource Conservation and Recovery Act (RCRA) exempts materials which are covered under the Atomic Energy Act. The Environmental Protection Agency (EPA) is authorized to regulate NARM under RCRA but has not proposed regulations to do so. It is strongly believed that discrete NARM sources should not be regulated under RCRA because (1) this would not provide for the up-front control of its use, and (2) it would not adequately solve the disposal problems. Diffuse NARM, such as phosphate residues, nonuranium ores and slags, is probably more appropriately regulated under RCRA.

It is strongly believed that NRC disposal regulations are much more appropriate for discrete NARM waste than are RCRA disposal regulations. If discrete NARM is not included under the Atomic Energy Act, then it would probably eventually come under the control of RCRA. Not only would this create a dual regulatory problem at those disposal sites which currently accept NARM, it would also create a dual regulatory problem in those Agreement States which regulate NARM under regulations which NRC represents to be compatible with radioactive materials covered by agreements with NRC. This would lead to a situation similar to the one which currently exists with mixed wastes.

NARM and CERCLA

The Congress has provided authorization to the U.S. Environmental Protection Agency to "clean-up" areas contaminated by hazardous substances. This authority is provided by the Hazardous Substances Response Trust Fund, established under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980. Some areas and facilities which have been contaminated with NARM have received funding for "clean-up" under this Act.

A question has been raised: If the Atomic Energy Act is amended to include NARM would such amendment affect or restrict the use of CERCLA funds for NARM contaminated areas or facilities? To clarify the issue, a new section is proposed in CERCLA which would allow the continuation of such funding for NARM contaminated areas and facilities.

Other Studies and Opinions

Over the past several years other organizations and groups have taken the position that NARM should be included under NRC regulatory control.

— The NRC Agreement States, following their October 1974 meeting, recommended that NRC bring NARM under its regulatory control.

— The Conference of Radiation Control Program Directors in a May 8, 1975, letter to the then NRC Commissioner Kennedy, stressed the need for NARM to be regulated at the federal level.

— A task force established in 1976 by NRC to study the NARM issue recommended that NRC seek legislative authority to regulate NARM.

— The National Governors' Association, in its publication, The Agreement State Program: A State Perspective, dated January 1983,[3] states, "The Atomic Energy Act should be amended to authorize the regulation of radioactive materials not presently affected by the Act, that is, naturally-occurring and accelerator-produced radioactive material (NARM)."

— A 1984 survey (NUREG-0976) of the states by NRC showed that all the (then) twenty-seven Agreement States and sixteen of the twenty-three nonagreement states supported the regulation of NARM by NRC. Of the remaining seven, only four were opposed to NRC regulating NARM with two undecided and one with no reply.

— At the October 1984 meeting of the NRC Agreement States, a resolution was again adopted which called upon the NRC to include NARM under the Atomic Energy Act.

— In May 1985, the Conference of Radiation Control Program Directors again adopted a position that NARM should be included under the Atomic Energy Act control.

— At the October 1986 meeting of the Agreement States, the attending states again advocated inclusion of responsibility to regulate NARM in the Atomic Energy Act.

Conference Position

The Conference of Radiation Control Program Directors has evaluated the NARM issue in the United States and has observed that the use of NARM is common and widespread throughout the country and that the control of NARM is varied and fragmented. The resulting nonuniform control of NARM creates confusion on the part of users and waste generators, and creates a potential for excessive radiation exposure to both radiation workers and the general public.

Based on the information contained in this paper and in a 1985 Conference resolution, the Conference recommends that the Atomic Energy Act of 1954 be amended to authorize the Nuclear Regulatory Commission to regulate discrete sources of naturally-occurring and accelerator-produced radioactive materials in the same way it is authorized to regulate other radioactive material identified in the act.

The Conference concludes that there are some non-NRC Agreement State radiation control programs adequately protecting the public through the regulation and control of NARM. Since the twenty-eight Agreement States control and regulate NARM in the same manner as material currently identified in the Atomic Energy Act, the NRC Agreement State members recommend that NRC establish procedures to maintain the continuation of NARM regulatory authority and control immediately following amendment of the Act.

Suggested language amending the Atomic Energy Act is attached to this Position Paper.

Comments on NUREG-1310

The following comments represent those, primarily of the Executive Board of the Conference of Radiation Control Program Directors, Inc. (CRCPD), although the program directors of other states, not on the Executive Board, contributed some comments.

General Comments

1. Mr. Austin is to be complimented on a very thorough and comprehensive report on the NARM issue. He appears to have considered all the ramifications of NRC regulation of NARM.

2. The document references the " CRCPD Position Paper on NRC Regulatory Control of NARM," but it would appear the rationale contained in this position paper was not thoroughly considered.

3. The referenced position paper appears to be the main stimulus for the study reported in NUREG-1310. If this is true, then NUREG-1310 expanded the scope of inquiry substantially beyond the issue identified in our position paper. As stated in the position paper, the CRCPD recommends, "the Atomic Energy Act of 1954 be amended to authorize the Nuclear Regulatory Commission to regulate discrete sources of naturally-occurring and accelerator-produced radiaoactive materials" (emphasis added). The paper specifically, and clearly, identified "discrete" sources. NUREG-1310 addressed diffuse sources, radiation producing machines, radon and other sources that are beyond the scope of the CRCPD position paper. This is not necessarily a criticism, but appears to "muddy up" the central issue.

   It should be emphasized that the major concern of the CRCPD is the non-uniform regulation of DISCRETE NARM SOURCES.

Specific Comments

1. Ref: Executive Summary, page vii, 1st paragraph, which gives rationale for Congress never seeking to expand the Atomic Energy Act (AEA) to cover NARM.

   Comment:

   There is no indication, at least to the CRCPD, that Congress has recently considered and declined to amend the AEA to include NARM. Therefore, would Congress, today, if requested, continue to exclude NARM from the AEA?

   As stated in NUREG-1310, of page 15, it is the responsibility of the federal government to promote the general welfare and specifically to protect the

citizens of the United States where risks have been identified. The Federal government has several precedental actions to show they can, and will, "step in" and provide the needed services. Examples are the provisions of the Clean Air Act and the Clean Water Act, which specifically mandate a Federal agency to regulate and control identified hazardous pollutants.

2. Ref: Executive Summary, page vii, 4th paragraph, 2nd Sentence.

Comment:

We fully support the statement indicating that any effort to control NARM calls for an integrated program to ensure that the dominate hazards are appropriately addressed. When any group of radioisotopes, selected on administrative, rather than physical or biological considerations, is poorly regulated or even ignored in some states, one cannot deny that such material may be the dominant hazard in that state.

3. Ref: Executive Summary, page vii, 4th paragraph, 4th Sentence.

Comment:

Although available data may indicate that significant NARM exposures to the public are rare, many states do not adequately inspect, or even solicit reports on NARM incidences, and some states even ignore NARM. There are not sufficient reliable data from these states to conclude whether exposures are occurring or not.

4. Ref: Executive Summary, page viii, 1st paragraph.

Comment:

Although Congress has given certain NARM responsibilities to several federal agencies, it would appear that none of these agencies have sufficient interest in regulating the use of NARM, judging by the lack of progress since the passage of the referenced legislation. Also, the CRCPD believes the NRC is the federal agency having the most experience, the most complete regulations, the best established licensing procedures and the most thorough inspection program for discrete sources of radiation. To develop a NARM licensing program in an agency other than the NRC would require substantial duplication of already existing capabilities in the NRC. The major objective of the CRCPD recommendation is for NARM to be licensed and regulated in a similar manner as byproduct material.

5. Ref: Executive Summary, page viii, 3rd paragraph.

Comment:

We cannot agree totally with the comment that the states are increasing the amount of attention given to NARM. Although most states do inspect NARM, the actual inspection frequency, in at least twelve states, is rare, many times exceeding six years or more for any particular source. For some states, although they do inspect, their enforcement program is weak, due to "no teeth" in their regulations. Using the inspection and enforcement criteria of the NRC for byproduct materials, these programs would be rejected as being inadequate for the public health and safety.

6. Ref: Executive Summary, page ix, 2nd paragraph.

Comment:

It is stated that the NRC can facilitate the regulation of radium disposal by specifying acceptable and unacceptable concentrations of radium for disposal. Under what authority can NRC specify such limits? Assuming that authority does exist for setting such concentrations for radium, why can't this same authority be used to meet the recommendation of the CRCPD regarding discrete NARM sources?

7. Ref: Page 1, 2nd paragraph, 2nd sentence.

Comment:

We cannot agree that the issue is "whether the Federal Government should preempt the authority that the states already have." This may be an issue, but certainly not the issue. **The issue is that NARM should be uniformally regulated and controlled in the United States, and it is not.**

If the NRC would obtain authority to regulate NARM, a program similar to the present NRC-State Agreement Program could be established for NARM, thus allowing those states with adequate NARM programs to continue the regulation of such material. This NARM Agreement Program would no more preempt the states than the existing Atomic Energy Act already does.

8. Ref: Page 2, 3rd paragraph, 8th line.

Comment:

The reference to whether Federal control of NARM should be the next target for Congress in reducing radiation exposure implies that only one target should be addressed by Congress. Cannot Congress have multiple targets regarding radiation protection?

9. Ref: Page 3, 2nd paragraph.

Comment:

As stated previously, if the CRCPD position paper on NARM stimulated the NUREG-1310 document, why confuse the main issue of regulating discrete NARM sources with issues involving cobalt teletherapy units and x-ray devices. We don't want to imply that these two radiation sources don't need adequate radiation control, but they tend to lead the reader from the basic issue.

10. Ref: Page 3, 3rd paragraph, line 5 thru 10

Comment:

An analogy is used to show the dichotomy of Federal regulation of the use of a cobalt-60 unit, when an x-ray therapy machine, standing beside the cobalt unit have no Federal regulation. It is stated that this is equal to NRC regulation of byproduct material used in nuclear medicine, but not regulating NARM used in nuclear medicine.

One major difference in the two comparisons is that most all states have a strong x-ray program, but twelve (24%) do not have a strong NARM program.

Also, one might take the position "Do two wrongs make a right?"

Lastly, the necessary actions to regulate a cobolt unit when compared to machine produced radiation is substantially different. The regulatory actions for byproduct and NARM are the same.

11. Ref: Page 9, 1st praragraph under 4.1, lines 3-6.

Comment:

The statement in the NUREG-1310 document, that the number and severity of radium incidents cannot be determined since the Federal Government has never had authority to control radium possession, supports the need for Federal control.

12. Ref: Page 11, item 4.2.

Comment:

It appears that several statements in the NUREG document are based on information from the October 22, 1987, survey of the States by CRCPD. It should be pointed out, as stated in the report, that only 17 (34%) states responded to the survey. This is a rather low response rate to make any accurate judgements on NARM incidents in the United States.

13. Ref: Page 39, item 8.

Comment:

Five options are listed. It is strongly recommended that for option (2), that the words "discrete sources" be added before the word "NARM".