UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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MEETING

NRC Regional Inspectors to Discuss License

Radiation Protection Programs for Nuclear Power Plants

Room 6110
Maryland National Bank
Building
7735 Old Georgetown Road
Bethesda, Maryland

Tuesday, 25 September 1979

BEFORE:

DON NEELY
AL GIBSON
ROBERT GREGER
BLAINE MURRAY
FRANK WENSLAWSKI
FRANK MIRAGLIA
SHLOMO YANIV
OLLIE NORTH

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MR. MIRAGLIA: I guess you've all seen copies of Mr. Sniezek's memorandum outlining generally what the purpose of this meeting is. We are all members of the special inquiry group that has been established by the commission to look into the TMI incident.

Most of us are members of Task Group 3 which is concerned with the radiological releases from the TMI incident. And as part of looking into the releases and the consequence of those releases, we have looked at the in-plant radiation protection program.

The focus of the inquiry is similar to that conducted by I&E and in particular, Al Gibson's team in the I&E investigation.

There is a little bit of a departure in broader scope to our inquiry in that we're looking at not only the licensee's response to the incident, but the response of the NRC, federal agencies, and the state agencies involved.

In the conduct of the inquiry, the focus in NUREG 0600, which was the I&E report, was basically on the licensee response. And the results of that report indicate that there were a number of deficiencies in the in-plant radiation protection program at TMI.

The purpose of this meeting is for us to have some feel for where TMI stands with respect to its radiation protection program in relationship to the other commercial nuclear power

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reactors out here.

Like the I&E investigation, our group is kind of resource limited and we didn't have the luxury of perhaps going out to several of the power plants and getting a feel for where the radiation protection params stand.

And the purpose of this meeting is to, in concert with you, gentlemen, get some feedback and general discussion as to what the situation is at the commercial nuclear power reactors with respect to radiation protection.

I guess what we should do is go down the table and indicate who we are and what our affiliations are.

I will introduce the members from the special inquiry group. My name is Frank Miraglia, and I am group leader of Task Group 3.

To my right is Ollie Lynch, Task Group 3, special inquiry group. To his right is John Dienelt. John is a consultant to the special inquiry group. He's an attorney who is assisting our group in looking at the radiation releases from TMI.

To my left is Schlomo Yaniv, member of Task Group 3, and Harry North, who is a member of Task Group 4. Task Group 4 of the special inquiry group is focused primarily on what the licensee's response was during the course of the incident.

And with that, why don't we go around the table and each of you gentlemen just identify yourselves and your affiliation.

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MR. NEELY: I'm Don Neely from Region I, radio specialist currently assigned to TMI, lead radiation specialist

MR. MURRAY: Blaine Murray, Region IV, radiation specialist.

MR. WENSLAWSKI: Frank Wenslawski, Region V, chief reactor radiation safety section.

MR. GIBSON: Al Gibson, Region II, chief radiation support section.

MR. GREGER: Bob Greger, Region III, radiation specialist and acting chief for the radiation support section.

MR. MIRAGLIA: As part of Mr. Shiezek's memorandum, we had a proposed agenda attached to that memorandum. Our thought is to pick a topic off the agenda, generally introduce the topic and have each of you gentlemen relate some of your experiences with respect to these various areas at the licensee plants that you are familiar with in your various regions.

MR. GIBSON: Is this the same agenda as we were given previously?

MR. MIRAGLIA: Yes.

MR. GIBSON: Frank, more specifically, what do you expect to do with the results of this meeting? I assume that your report will include some assessment of generic implications of TMI.

But will you go so far as to recommend, for example, changes

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in the NRC inspection program and things of this nature?

MR. MIRAGLIA: I think we would like, if we can, to make recommendations with respect to not only the NRC's inspection program, but the NRC's licensing program on the regulations themselves.

One could look at deficiencies and indicate, well, the inspection program didn't uncover deficiencies in certain areas. But one can also say that perhaps the inspection program was hampered by lack of specificity in the commission's rules and regulations for pointing to deficiencies in this area.

And if we can give the regulations more teeth, this is something that we are interested in and we would like to face.

The problem that we are faced with is that we haven't looked at other facilities. We didn't have the time, we didn't have the resources.

And this is an attempt to try to get some feeling for where TMI stands. Is it a bell-shaped curve out there with respect to the distribution of adequacy of the licensees' rad protection programs?

Is TMI in the middle of that curve, to the left of that curve, or to the right of the curve?

If we can get that out of the meeting, that's a plus.

As part of the inquiry group's approach, the management of

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the inquiry group, Mr. Rogovin and Mr. Frampton have attempted to establish peer review groups.

We have a peer review group in the health physics area. The members of that group are: Mr. Herb Parker from Battelle Northwest Laboratories; Dr. Jacob Shapiro, Harvard University; and Mr. Clare Palmeter, consultant here in Washington.

And in a meeting which we held with the peer review group in mid-August, this group, peer review group, indicated to the management that it would be helpful if we could get some feel for how representative or non-representative the TMI experience is with any other power reactors.

And again, because of resources and time, we felt that this would be a way of getting some information and feedback. It's an informal meeting. We are making a transcript of the meeting.

I think it would be appropriate that we would provide you with a transcript of the meeting to make changes that you deem necessary.

I don't think that we have any problem with doing that. How it will be used really depends upon what we gain from this meeting now. But we are looking basically to get some sort of comparative -- relative comparison of what we have noted as a result of TMI, bring it into a more generic picture, if it can be.

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And that's the basis for the meeting.

MR. WENSLAWSKI: Frank, can I say something before we get in the meeting?

Something -- I have an idea what I think that you are trying to do. And I just want to say this up front: I am a bit concerned that you are going to formulate opinions about Met Ed based on what you will be getting from us, and in turn, we basically have it, at least speaking for myself from our inspectors, who are most familiar -- and looking at your agenda here, if you are going to talk details of how people calibrate instruments, et cetera and so forth, the inspectors are most familiar with the detailed operating procedures.

It worries me a little bit that we as section chiefs in turn get our opinions and judgments basically from the inspectors.

Now you will get them from us. You're getting further and further downstream from the licensee. I would just like to caution you that to me, the best approach would be that you go directly to a licensee.

I understand that you don't have the time to do that, but again, I don't feel that you are going to be getting as direct information as you could be by going the way you are.

MR. MIRAGLIA: I think that's a fair comment, Frank, and I think we recognize that. And I believe in the memorandum

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either we sent you or in the memorandum Shiezek put out to you -- we're not going to try to get into the level of detail as do they calibrate every week versus every month. But is there a calibration program? Do they implement that calibration program?

I think what we are after more is general impressions as to what the status of the programs are. I don't think that we're looking at whether they conduct a drill every month and what scenarios do they pick for the drill, but just some general characterization for what the programs are out there as compared to whatever extent we can compare it to to what we have noticed at TMI.

I think we recognized that problem, Frank, and I think that this is just an attempt to try and get some basis of comparison, however relative it may be.

And the information and conclusions that we can draw from that information will only be as strong as the information we have before us.

I think we recognize that inherent weakness in that we are not doing a detailed examination of each licensee program.

And I don't think that we would necessarily say that Reactor A as compared to TMI is X-percent better or worse based upon our conversations.

I think that we are trying to get a general impression as to what your experience has been based upon the knowledge you

have had personally by going to these reactors and the knowledge that you have from looking at inspection reports and results from your inspectors, what they report to you as to where these people stand in the general framework of radiation protection.

MR. DIENELT: If I could add to that a thought, maybe it's the same thought differently stated. We don't, or at least I don't, have, being basically an outsider, any sense of how Met Ed or the problems that Met Ed seems to have fits in or compares in any kind of a broad context to other licensees in general.

It is not the specifics of a particular licensee or a particular licensees that we're interested in, so much as making sure, or trying to make sure, by talking to you, that the impressions that we have and the conclusions that we seem to be headed towards are fair.

We don't want to be unduly harsh. We don't want to be too easy. We want to call them as we see them. But also, make sure that we are making a fair judgment. And in order to make a fair judgment, we have to have a background against which to assess the performance.

And that background, hopefully, will be supplied by a general discussion with you all, which would really be more valuable than talking, spending the same or greater length of time talking to individual inspectors or individual

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licensees because we're looking for the broad picture. And broad picture is something which I think you all are probably better able to supply than other individuals who have focused on one or only several licensees, just as we're focusing on only one licensee.

The other point about that that I think makes you as the section chiefs valuable is that if you even step back from the licensees and talk about the process of inspection and enforcement and the process of the radiation protection programs that are developed, one question which this special inquiry group has to address is how can the process be improved?

And you are telling us how things could be made better or easier for I&E will be valuable and would help us.

So I think, again, that's something that we need to have from your level of operations rather than from the individuals.

MR. GIBSON: The product of your investigative efforts will be a report to the chairman, I guess, which will include recommendations that he has some power or authority to do something about, I guess. And presumably, he will implement the recommendations, I guess.

Is that generally it?

MR. MIRAGLIA: That's fair.

MR. DIENELT: There may be recommendations that he doesn't have power to implement. It would have to be made

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elsewhere.

MR. MIRAGLIA: Changes in legislation, perhaps, and authority.

MR. DIENELT: It's conceivable that one finding would be a criticism that he didn't have enough power or something at a level like that. But certainly, what you suggest presumably would be a large part of it.

MR. MIRAGLIA: Is there any other discussion that any of you gentlemen want to have on that issue?

(No response.)

MR. MIRAGLIA: The first item on the agenda is the management of radiation protection program. Within that major item, there is the area of procedures. It is clear that TMI had procedures. The problem they appeared to have is the implementation of those procedures in all aspects.

Within the process of licensing and inspection, I guess the requirement is generally on the licensee that they have procedures that meet some very minimum kind of specification. And we would like to get the perception of each of you individuals with respect to what the experience in the field has been with respect to procedures and the licensee.

Have they been developing procedures? Are they adequate procedures? And the problems that you have in inspecting against the procedures.

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I won't go around the table in any particular way.

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MR. GIBSON: Obviously, all licensees do develop procedures. They are required to by technical specifications. Technical specifications normally refer to Reg Guide 1.33, which specifies in a general way the areas for which procedures are to apply.

My personal opinion is that it is appropriate to leave procedure development up to the licensee and not to have procedures developed by NRC or to have a more formal approval of procedures by NRC because each licensee knows best what procedures he needs.

Also, if we formalize to too great an extent, I think the standardization would stifle the progress by the licensee.

So I don't think that the system is bad. That's a personal opinion. I think that which procedures are developed, it depends on a couple of things. It depends on which ones the licensee feels inclined to develop and it depends on which procedures the IE inspector thinks are needed.

During our pre-operational inspection program and the OPs program IE inspectors review physics procedures. And probably all of our inspection program may not call for it. We review almost all of those procedures.

And if they're not adequate for one reason or another, we comment. And I would say generally, our comments are resolved to our satisfaction.

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Perhaps we need more uniformity among licensees on procedures. But I would be cautious about standardizing too far.

MR. MIRAGLIA: With respect to the general requirements in the reg guide, are there areas that we could perhaps be more specific in with any development of procedures? Have we missed any areas?

MR. GREGER: The reg guide speaks in general terms and I would say that that is probably one place that you could be much more specific in specifying at least some of the routine procedures that are needed.

Obviously, some procedures are going go be -- are going to apply at one facility and not another because of various operating procedures and equipment, many different things.

But there are certainly a core of procedures that could be specified in the reg guide for rad protection that are not -- the reg guide is rather general and that's one of the problem areas.

The problem that we find at least in procedures is if a licensee does not have a procedure, it become difficult in some cases to find a regulatory requirement for them to have that procedure.

As Al said, Reg Guide 1.33 is referenced in many of the tech specs. Not all tech specs. Some tech specs reference no requirement for procedures at all in radiation protection

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rad waste areas, which is one problem. Those are older tech specs and they're being brought up to date. But they haven't been brought up to date for all plants.

Some tech specs may require that procedures may be implemented -- that procedures be developed, but not be implemented.

And so we may go into a licensee and find that they have a procedure and aren't following it, and there may be no tech spec requirement that they follow the procedure.

Another problem -- both of them with tech spec requirements.

And then the third problem is if they do reference the Reg Guide 1.33. It is not very specific and you are a little hard pressed at times to say that a specific procedure is required by the reg guide.

MR. MIRAGLIA: Can you give some examples, Bob, of areas, perhaps, where the reg guide could be more specific?

MR. GREGER: I think if we could get hold of a copy of the reg guide and take a look at it, we could show you pretty easily -- well, I can give you one example: Operation of solid rad waste systems.

I think the reg guide is rather general in saying what types of requirements -- what types of procedures are required for rad waste systems.

As I recall, it talks about requiring procedures for quantification with respect to solid rad waste, quantification

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for the amount of wastes complying with the regulations, for shipping waste. But nowhere does it say a licensee should have procedures for actually operating solid rad waste equipment.

MR. GIBSON: I believe -- well, in fact, back in the region, one of the things that we have scheduled for next month is for me to get my group of people together and pool our experience and come up with a list of procedures and a set-up for each procedure.

I believe that such a reg guide would be useful, although I am not -- I don't believe that a reg guide that develops very explicit, specific procedure titles and scopes should be placed on the licensee as a regulatory requirement.

I think if the thing exists, that most licensees would voluntarily comply.

Normally, I'm a pretty strict regulator. I sound out of character, I guess, but I think -- I'm not sure that we're in the best position to come up with a comprehensive list. I think that the licensee is in a better position in some cases.

MR. MIRAGLIA: The fact that whatever is described to a licensee is in the form of a reg guide as opposed to a regulation, is this a problem area? In other words, do we meet resistance or lack of teeth in the enforcement effort because something is specified in a regulatory guide?

Now each regulatory guide has got the standard phrase, that

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this is not necessarily a requirement.

However, it specifies an approach to meeting the requirements in the regulations.

Every reg guide's basic -- the reason that we have that reg guide is to demonstrate fulfillment with some regulatory requirement. And this would be deemed, "an acceptable way of demonstrating compliance with a particular regulation or specification."

MR. MENSLAWSKI: Can I address that? Plus I want to follow up something both Bob and Al were saying.

One thing about -- I suspect that tech specs vary quite a bit right now. Bob was saying that some tech specs don't even have certain requirements. We don't have as many operating plants as 3 or 1, but I can say that our tech specs basically have two requirements. One requirement is that a licensee have procedures consistent with the requirements of Part 20. And that's a very generalized tech spec requirement. But that in itself has a lot of teeth.

And the second one is the one that makes reference to the reg guide, which in turn makes -- answers your question and makes the reg guide a legal requirement on a licensee since it's referenced in tech specs and which gives us teeth.

What I want to follow up on is more along what Al was talking about, and I would concur with him more than I would with Bob that as far as the radiation protection program goes,

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I think our experience is if you have a radiation protection supervisor who is anywhere near worth his weight to the facility, they will have the basic procedures necessary to implement a radiation protection program, basic procedures such as issuing dosimetry devices, control contamination, performance of surveys, the basic procedures necessary for a program.

If you start getting more exotic, for example, operation of rad waste system, I don't really -- I'm not inclined to consider that as a radiation protection procedure, but more of an operational procedure.

And there I would concur in what Bob is saying. It's a gray area where licensee may have some procedures, or he may not.

But I personally feel that the situation, as it is now, is essentially adequate for the requirement that a licensee have procedures. I think the tech specs could be worded a little bit more clearly. For example, use the words "adhere to."

That is a real problem. If it says, "develop procedures," and the first argument we get from the licensee, he'll say that I don't have to adhere to it. It makes it very clear if it says develop, maintain, and adhere to.

MR. WENSLAWSKI: This is not always the case, depending on the tech specs.

MR. GIBSON: I know you are not interested in NMSS fuel facility procedures, but NMSS refuses to place an adherence reuqirement on a fuel facility license. They only say "develop" because they don't want inspectors to assure verbatim compliance with the licensee procedures.

MR. WENSLAWSKI: The basic point I want to make is that I feel the program as established by NRC is essentially adequate. I think the reg guide and latest revision of it is essentially adequate as far as defining the basic types of procedures.

And I am myself reluctant to go into greater depths saying you need a procedure for this, you need a procedure for that, you need a procedure for that. I am not that great of a regulator where I think we have to lead a licensee around by the hands.

I think if they have a staff that is anywhere halfway decent, they themselves know those types of procedures.

Now, we do get into problems at times where we would wish a licensee had a procedure, because we see problems in that area.

And that's the case when I&E usually plays it by ear. We discuss it with the licensee and at least in Region 5, for the most part we are usually cooperative. In talking to some other

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people from some other regions and some of these bigger, older utilities back more in the East, I guess at times they can be pretty obstinate in their negotiations.

But I personally feel that the program as laid out is essentially.

MR. MIRAGLIA: With respect to procedures, there is two distinctions that come to mind based on the discussion so far:

That there is a requirement to have procedures. Is it generally the case that -- well, there is another requirement that there is some sort of onsite licensee committee that reviews procedure.

Is it necessarily true in all cases that in development of procedures, be they operational procedures versus radiation protection procedures, that it does require the review of radiation protection officer on the site, a licensee requirement.

In other words, that the plant operations review committee include in its quorum, so to speak, the radiation protection officer or someone from the radiation protection program.

MR. NEELY: Some tech specs do. Such as TMI, anybody can set up a quorum. It doesn't have to be a rad protection.

MR. MIRAGLIA: Is that an area that should be perhaps looked at? Is that something that -- would it be a fair

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requirement that radiation protection be considered in the development of a procedure, and that a minimum quorum should include the approval of a radiation protection office?

A good example would be the solid rad waste system.

MR. GIBSON: I would like to see radiation protection review and approval of procedures. I am thinking of maintenance procedures and operations procedures that involve some radiological -- some potential radiological problem, potential for spread of contamination or receipt of more than a few millirem, and not all licensees have this policy.

You know, some maintenance procedures, for example, may not be reviewed by the plant review committee at all, and they may be written by the maintenance department and not reviewed by radiation protection at all.

And I think that whether it is done in committee or as an individual concurrence, I think some criteria should be established by the licensee, some radiological criteria such that when that criteria is met, the procedure has to be reviewed by the radiation protection department.

MR. MIRAGLIA: So my understanding is that that is not the case in all instances, but perhaps that is an area that could be implemented.

MR. WENSLAWSKI: I would comment on that, too.

I think from my experience that what you said is a good point. I think probably if you talk to the chem rad supervisor

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in a lot of plants, you would probably find several -- quite a few of them somewhat irritated at times because operations comes out with a procedure, and specifies certain things that rad protection has to do.

They don't even know that the procedures are coming out, haven't concurred in it, and there is somewhat of a separation.

And I personally feel if rad protection had more say in the development of procedures, and perhaps being on the -- I don't know if there is a requirement, I can't think of one off the top of my head that they be on the plant review committee. Sometimes they are, I guess sometimes they are not.

But it is certainly a function that ought to be represented in the plant review committee, and I think they ought to be more involved in reviewing procedures and getting their comments in. I think it is a potential problem area.

MR. GIBSON: I think a generic problem -- of course, you can say this about anybody's radiation protection program -- but I think there is a need for more preplanning of jobs involving radiation exposure.

And most utilities control exposure through an RWP program, radiation work permit program. Health physics doesn't become involved until the day the job is going to be done.

Someone comes in and says, "I am getting ready to cut out this piece of pipe inside containment; I need a RWP." And the technician gets about 15 minutes to plan the job.

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He should have reviewed the procedure two months earlier and perhaps recommended temporary shielding and maybe some prefabrication of stuff in a lower radiation area of whatever controls are necessary. But there is not enough of that going on.

MR. MIRAGLIA: Would the Reg Guide 8.8 help this at all out? What do you think it still needs to be --

MR. GIBSON: Reg Guide 8.8, if it were required of licensees -- you know, there was discussion a few months ago about having each licensee develop an ALARA program and submit it to NRR or submit it to regions, I guess, for approval, which would include, I guess, many of the things we will talk about today. I thought that was a good program.

Then the program was going to legally enforceable through the tech specs someway. And the feedback I got was -- I believe it was Chairman Hendrie did not want to add requirements to the tech specs at that time. So the thing has been tabled.

But one thing we might keep in mind as we discuss all of these items as an approach, would be for us to put out a reg guide to say each licensee should develop a program to keep radiation exposures as low as reasonably achievable in accordance with the guidance in Reg Guide 8.8.

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And we could specify more specifically what things are to be in that program, and the program would be submitted to NRR for review and approval, or to NRC. I would like the region

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to get a crack at it. And once approved, it is referenced by the tech spec and is enforceable.

MR. MIRAGLIA: In taking off from your point, from the point of view of when tech specs are developed for a facility, what input if any does the region have? When do you folks get involved? Do you get a licensee grant and say, "Here is the tech specs, go and inspect"? Are you plugged in earlier? Is this an area that can be improved?

MR. NEELY: The final draft, and then it is usually too late.

MR. GREGER: That is not necessarily true in our situation. We have got a lot of initial draft tech specs of the most recent plants to come on the line. We have been plugged in fairly well.

But it is a great waste of our time to sit down and review draft tech specs when in all likelihood they are going to undergo massive change before they are ever implemented. We don't have the manpower to waste to do that.

The climate in NRC licensing has been such over the last two years that one did not know from week to week what the current tech specs model was going to look like.

Now, maybe when the Appendix I tech specs are finalized this won't be a problem any more. But that has been a problem in the past.

I have followed Davis-Bessie, received a license a year and

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a half ago, and their tech specs were changed radically one month before they were supposed to get their operating license.

And so I have wasted considerable amount of time reviewing draft tech specs. And when they came out with the new draft I had a month, along with a lot of other chores at the same time, to review the tech specs.

MR. MIRAGLIA: Is is a problem, Bob, with respect to you having the sufficient time and then it is not generally thought about as a function of the inspector to have this participation?

And therefore when you plan, say, your next three months, if you have the luxury of looking that far ahead, you know and say, "I have to have a block of time," that I know I am going to be asked to take a look at these kinds of things.

In other words, if it is something you could plan for, could the participation be more meaninful? And is it something that perhaps should be considered to get you fellows involved early, with the understanding that this is part of your function so that there is sufficient time and resources available? Is it that kind of problem?

MR. GREGOR: It is a bit. But I am probably of a different opinion than other people on that.

I am not so sure that I would really want to waste that amount of time early in the game looking at the tech specs. I would rather be able to get very quick turnaround on tech

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spec changes, on needed changes that I or my people would identify when they do inspections.

Because in order to really look at tech specs and determine whether or not they are good or bad, enforceable or unenforceable, you have to go out and do an inspection, almost, with them. Just by looking at them it is extremely difficult to tell if there are going to be little problems creeping in.

So we go out and we do an inspection, and we identify problems. And it literally takes years in some cases to get changes implemented that we would recommend.

MR. MURRAY: If we are talking just in the area of health physics, there isn't that much in the technical specifications that address health physics. You know, there is not even half a page.

If you are going to get into the areas of effluent releases, this type of thing, with the model tech specs, then there is a lot of review.

But you pick up any utility and look at the tech specs, and there isn't anything in there on health physics. There is going to be maybe a couple of paragraphs, the canned tech specs that they just throw in there. But there is really nothing to review as far as health physics technical specification.

It isn't until we get into the area of environment effluent releases that the tech specs become complicated.

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MR. LYNCH: Would it be safe to say for the tech specs for the health physics program are really implemented by the procedures that a licensee develops?

MR. MURRAY: Sure.

MR. LYNCH: This was the concept of the new tech specs -- for environmental work -- had very little in them other than to say that there was a procedures document, and the procedures document really implemented the program and the procedures document was first approved by NRR.

But after it was approved and became part of the license, then it was changed by the applicant.

If we saw any problems with it, then we would tell them not to change it, or to go back, revert to the previous program.

But I don't know if there is an appreciation here that a tech spec changes a license amendment, and as a license amendment it goes through all of the rigors of what a license amendment goes through, including the possibility of a hearing.

MR. GIBSON: I think that we have all heard that many times. But it gets very frustrating, for example, at Oconee who has a tech spec requirement to go out and look at the screens on the intake pipe to see if there are any fish trapped on the things, and the screens are 120 feet under water and they can't see them. But every day they go out and look over the end of the pier and they say, I don't see any fish.

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And we tried for three years to get that tech spec changed and couldn't. I think that is a graphic example of what we are talking about. It doesn't really have safety significance but it is frustrating for inspectors who run across this thing on almost every inspection.

MR. MURRAY: Let me just tell you typically what happens.

You go in and you visit a licensee during the preop inspection. I will go in, and I know that in the tech specs they are going to have the canned phrase that you are going to develop tech specs to be adhered to and all this.

But what I typically do is I have a list, and it is something similar to what Al is talking about. That I want to see procedures developed to cover, you know, a list that I have -- surveys, personnel monitoring, calibration of portable survey meters, calibration of portable monitors, the whole thing.

So I will go down this list, you know, and just, "Where is your procedure for that, and how are the details going to be?" An entire laundry list of procedures that I want to see developed before I am satisfied to -- for them to receive an OL.

And that is typically the approach that is taken.

You know, there is procedures and there is procedures. You can go in to one utility and they may have a page to cover a certain activity. And the next one, it may be 20 pages for that

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So, you know, to a certain degree it is a lot of -- the inspector is kind of under the gun to see that the procedures are developed and enought details so that they cover the activity that is addressed.

MR. MIRAGLIA: Would an approach such as Ollie outlined as contemplated from the environmental specifications in that the broad specifications are written in a certain performance?

And one of those specifications that there is quote unquote a procedures document or manual that requires approval. Would that be of assistance to the inspectors, that a program to implement the technical specifications is specified and has some approval --

And then also coupled in the technical specification is a mechanism by which these procedures can be changed through the management chain at the licensee, be helpful?

MR. WENSLAWSKI: I think we have now basically have that system. I think all tech specs have the basic requirement that the licensee shall have radiation protection procedures consistent with Part 20, and I would imagine that maybe other regions could comment that all facilities have what they call radiation control manuals, which is usually the document intended to implement that requirement.

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What could be done, however, is something like the standardized tech specs, would make it a little bit more clear,

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a more straight line of logic. For example, the off site dose calculation manual as that is intended to be in the standardized tech specs for the environmental tech specs.

Make it very clear, a very clear requirement that he will have this manual -- which they already have.

We just had a situation in Region 5 where we cited a licensee and he argued with us -- he hasn't formally responded -- but we cited him against his rad com manual based on a tech spec requirement of Part 20.

And he was saying, "I am not required to do that because I am doing what my manual says I am going about Part 20."

So I think if the requirement was clear, more clear that you shall have a manual to implement and you shall adhere to that manual or requirements in it -- in other words, it could be more formalized.

MR. MIRAGLIA: As I understand it, with respect to radiation protection, as to post radiological effluent limitations the procedures manual and the review of the rad protection program manual then is essentially the burden that the inspector looks at, rather than the licensor or someone in NRR in this case?

MR. MURRAY: That's right.

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MR. MIRAGLIA: Would putting the responsibility at least at the outset before a plant goes operational, that the broad program and some broad set of procedures to implement

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that program has some sort of licensed approval for you folks, and hopefully that you would be involved in the development of that -- would that be of assistance in any way?

In other words, have the requirement that he have procedures, and that the first set of procedures, at least, get some sort of sanction from NRC. And that there is a procedure change --

MR. WENSLAWS :: It would be a basic policy change for NRC.

Right now the emergency plan procedures work the same way. Licensee has to submit an emergency plan, but he doesn't submit the procedures. We review the procedures, and I believe in operations there are very few if any operating procedures that are reviewed.

So if you are talking that, I think you are talking a pretty big program. It would not just be limited to radiation protection; it would be in the emergency plan, and inevitably jump over to operations. So where would you stop?

MR. GIBSON: I believe that review of procedures should be left with inspectors, rather than people in Washington.

MR. WENSLAWSKI: I agree with that.

MR. MIRAGLIA: I was just trying to get a feel for it.

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MR. MURRAY: I think what Al spoke to briefly is he mentioned in Region 2 he planned to get some of his people

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together and come up with a list of procedures and maybe carry that a step further as to what the detail or the content of the procedures based on the experience of the inspectors in the field would be very useful.

Because you go from one utility to another, and there is not a lot of uniformity within the procedures. Just that they call a particular procedures. You know, like in the area of emergency plannint now, I know there is quite a bit of effort being placed on adherence to this Reg Guide 1.101.

We are trying to get uniformity as much as possible within the various licensees.

You don't really see that within the area of health physics procedures.

I think basically it is all there but it is not really that uniform from one licensee to another.

MR. GREGOR: There may be no need for it to be there.

MR. MIRAGLIA: That was going to be my next question. Is the lack of uniformity the problem?

MR. GREGOR: I don't think so. Procedures, especially in rem protection area, are espcially plant specific, not just plant but individual specific, depending on the plant manager and the RPM, how they want to run their problem, rather, program.

You can probably run an HP program 20 different ways and

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still have it come out to satisfy the objective of maintaining exposures as low as is reasonably achievable.

And I would echo Al's and Frank's and Blaine's comments in saying that I don't think there are procedures that are plant specific can be reviewed by some one organization or group of people who is looking at all procedures for all plants in the country, because they would not be that familiar with the workings of that particular plant.

I think that review has to remain at the plant, and the only person that is going to the plant to do that right now are I&E inspectors. And for that reason, I think it should remain there.

I would disagree just a little bit with, I guess, a comment saying that the Reg Guide 133 may not need to be a bit more explicit.

Both Blaine and Al are saying it would be a good idea to come up with some type of general list of rad protection procedures to be used to go out and at least to start from when you look at a new licensee to see if he has got basic procedures.

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If we are going to come up with that list, why not put it in the reg guide so that everyone uses it throughout all the regions so the licensees know also what general procedures they need a little more specific than is in the reg guide now.

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Not to say that they couldn't deviate from that, not to say that they couldn't have additional or shouldn't have additional procedures if they need them.

MR. GIBSON: I think if it could be placed in there with the understanding that it is not legally binding that they meet it verbatim. But unfortunately I am not sure, with they way tech specs are being written, if it is placed in there that they will have a procedure for XYZ, and it will include the following. Then that is what they are going to have to have.

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MR. GREGER: You can write it generally.

MR. GIBSON: I guess I agree with you more than I have indicated. I think more specificity could be put in the Reg Guide.

MR. DIENELT: Do you have authority on a regional basis to prescribe, set forth procedures, in effect interpreting a Reg Guide, such as the one we have been discussing?

MR. GIBSON: Practically speaking, we do it. Whether we have the legal authority is questionable. But, for example, in a pre op inspection where we make a statement that if you don't develop thus-and-so procedure, we're not going to recommend you be given a license, they're going to go out and develop a procedure.

MR. DIENELT: So, as a practical alternative to putting more detail in Reg Guide -- is it 133? -- each of the regions could develop its own set of more detailed criteria, and they have done so.

MR. GREGER: Except the problem there is that we no longer have uniformity across regions, and there's no reason for one plant in one region be required to do something, and another in another region, not.

MR. GIBSON: I say it can be done in one of two places, could be done in a Reg Guide. Maybe that's the best place for it. Or it could be in an OIE inspection guidance.

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we have a documented inspection guidance for reviewing procedures.

MR. GREGER: It does specify procedures but the licensee doesn't know ahead of time that these are expected of him. And that's a problem there.

MR. GIBSON: Right.

MR. WEISLAWSKI: I think it would be helpful to have a copy of that Reg Guide here right now, because I looked at it in relationship to citing a licensee just last week. And the most recent issue of it. And it was pretty specific as far as broad areas go, and I'm not too sure I understand what you're asking for, Bob. If you're asking for it to go into each procedure for operating this and that because it says, you shall have personnel dosimetry procedures, you shall have this, you shall have that, broken down pretty clearly.

MR. GREGER: Okay, but if you go out and do an inspection, a pre op inspection, and the licensee is supposed to have personnel dosimetry procedures, you are going to look for neutron dosimetry procedures, something that gives him guidance on how to monitor for neutron exposures, beta exposures, gamma exposures, extremity exposures. You're going to look for a QA on the dosimetry equipment, and in the QA you're going to look for a couple of things, different things. You're going to look for an

accuracy check on it, you're going to look for some type of interchange, on whatever type of dosimetry program the licensee is using. I don't think that amount of specificity is in it.

MR. MENSLAWSKI: It doesn't go into that detail.

MR. GREGER: But that's a thing everyone should look at when they go out, and why not tell the licensee that's what they should be developing procedures to meet?

MR. MIRAGLIA: If I could summarize what I understand the discussion to be thus far, is with respect to procedures, I think, the general concensus -- and you fellows can correct me if I'm wrong -- is that we don't want to get in a mode where we are specifying the detailed procedures and have specifically indicating the step-by-step procedure that the licensee must follow, but we have in Reg Guide 133 at least a set of procedures that we said you should have at least these kinds of things. And that there is a level of detail between the list we have now, which are perhaps broad topic areas, versus the detail procedures, and maybe these detail topic areas could have some more specificity with some related subtopic areas under each of these. Am I mischaracterizing what you've said?

MR. GREGER: I may have given the impression, I guess, that I have a big problem with the way the Reg Guide is presently written. And I guess I really don't. In most

practical terms, I don't think we run into a problem in rad protection areas with new plants, because, as Al said, during the pre op inspections we have really do them over the gun. And we can almost require them to develop anything we want, because they don't want to go through the trouble of trying to go over our heads and get someone to cause us to back down.

So if we have some reasonable request for a procedure and we present it during the pre op stages, we can typically get that procedure implemented and written by the licensee. The only problems that we encounter in our region, really, are with older reactors who have gone through the licensing process five, 10 years ago or more, and those are the licensees that are extremely reluctant to develop, to write down procedures in many cases, because, to quote them, they developed the whole industry. They developed the procedures. There is no reason for them to have to write them down. They know how to do everything. They taught the NRC how to do it.

And so, I guess I don't really feel that there's a big problem today with the plants that are coming on-line. And typically, as we go through and pick out these old plants and revise their tech specs, which supposedly is going to take place as soon as the pressure is off on TMI, I think this whole problem of procedures may fall out.

The one problem I did encounter recently was with operation of the solid rad waste equipment. And in that situation we went ahead and cited the licensee, anyway, making an interpretation of our own, saying that the Reg Guide 1.33 had a subheading that said Rad Waste Systems, even though it was more specific and none of the specific items met the exact procedural requirement we were trying to impose.

The general heading Rad Waste Systems or Solid Rad Waste Systems was there. That meant we said that meant you had to have operating procedures for them. And we didn't get an argument. So, it's something I think we can work around.

MR. LYNCH: Let me see if I understand. Frank, to summarize basically what you're saying, let me see if I can summarize a result of that. Catching with what Frank Wenslawski said -- I think it was you -- about, if you have a qualified well-motivated individual at the licensee's plant that can develop these procedures and enforce them, then they will work. But if you don't have somebody that is well-qualified and motivated, then the system falls apart. Is that true?

MR. WENSLAWSKI: I wouldn't put it that way.

MR. LYNCH: That's the blunt way of putting it.

MR. WENSLAWSKI: From our experience, what I meant

to say was that utilities usually hire someone for the position of radiation protection chem rad supervisor. They usually hire somebody who has had a significant amount of experience, a person who is usually pretty fairly knowledgeable and they know what constitutes an adequate radiation protection program. That combined with the guidance that's already in existence in the Reg Guide -- there's more guidance in existence, by the way, than just that Reg Guide. I think there's an ICRP, I can't remember the number of it, a document that discusses radiation protection program, elements of a radiation protection program.

And there are other documents that discuss elements of the radiation protection program. And what I am saying is I believe these people that are usually knowledgeable enough in order to take the documents and put together a fairly decent program -- where the problems might arise is when you start fine-tuning things. For example, like Bob is talking about operation of a rad waste system. Nothing is that clearly defined that you shall have procedures, you shall have these procedures for operation of a solidification system. It doesn't go into that level of detail.

MR. LYNCH: But the success of the program seems to --

MR. WEISLANSKI: That's true. What you said is basically true.

MR. LYNCH: -- revolve about the competence of the individual that was basically in charge.

MR. WEISLANSKI: That would be true for anything you talk about, the success of NRC might revolve about the commissioners themselves.

MR. GIBSON: I think you may be oversimplifying it, though. Most utilities have a large enough HP staff so even if you have a sorry guy at the top you could still get good procedures out of an HP staff.

MR. GREGER: I think what Frank was saying, if you have a good HP, he's going to ensure that these procedures are well-written and cover the program. If you don't have a good HP, then in order for that program to function well, the NRC may have to play a more active role in requiring the licensee to develop the needed procedures.

MR. LYNCH: So, in this case, we need a good HP in charge of the plant's program, and a good inspector, or both.

MR. GREGER: I'm saying if you've got a bad HP in charge of the program it means that the IE inspector's going to have to do a lot more work to point out to the licensee exactly what procedures he needs and to make sure he has them. So even if the HP isn't that great, the procedures

are there and he can't violate them.

MR. LYNCH: It's a team.

MR. YANIV: On that question, what is your experience with regard to the type of people that head the HP program at the various utilities? What kind of people are there?

MR. WEISLANSKI: I can speak to region five the easiest and quickest because we probably have the fewest. Other than maybe region four, we have about the same. We have no problems at all with any of the people in charge of the radiation protection programs at our plants. We had a problem at Trojan wherein a utility chose to replace that program because of a fairly significant overexposure.

However, that was not necessarily the fault of the individual. I think, for region five anyway, that they are pretty good people. That's why I made that statement in the first place. I can't talk across the board for all utilities, but the people I run across, they have got some pretty sharp people, period.

MR. MIRAGLIA: We are getting into an area that goes — if one assumes that there are procedures and the procedures are adequate, the next step is in the implementation of those procedures. And that gets to the rad protection personnel at the facilities, number one. And number two is the utility management's attitude towards rad

kap 1 protection. And at least Frank has indicated that the rad
2 protection supervisors, if I can term them that, at the
3 region five facilities are generally qualified people.
4 The next thing is, what is the attitude of the
5 utilities management to these people?
6 MR. GIBSON: I believe that adherence to
7 procedures is a problem generically. I believe that any
8 aggressive inspector can go to any plant in this country and
9 come back with a laundry list of examples where they're not
10 adhering to their HP procedures.
11 MR. GREGER: I disagree. It depends on how
12 strongly the individual IE inspectors have been enforcing
13 compliance with licensing procedures in the past. And I can
14 give you, I think, in our region, half of our licensees, and
15 say if you went through you'd have a tough time coming up
16 with any significant discrepancies in implementation
17 procedures.
18 I can also say on the other half, you could
19 probably do just what you've said. You probably could come
20 up with a big list.
21 MR. GIBSON: I guess we differ in number. You're
22 saying 50 percent and I'm saying 100 percent. But I believe
23 you could, for example, go into the counting room, take the
24 technician who is operating a piece of equipment and go get
25 the procedure that he is supposedly following, and find,

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Hey, there was some step in there he didn't do, or didn't follow.

Maybe the procedure was screwed up and maybe the step was a ridiculous step.

MR. NEELY: You're talking about detailed steps.

MR. GIBSON: Step by step, verbatim compliance with HP procedures, and I don't believe it's being done. But maybe I'm wrong, because it's been a while since I inspected. When I was inspecting I felt that was the case.

MR. NEELY: Most of the licensees I think more or less are required to put the "shalls" in. They put the requirements with the "shoulds" where they don't get into that position.

MR. GIBSON: That was going to be my next point. This is a two-edge sword. If you strictly enforce verbatim compliance with procedures the licensee will take all the strong words out of the procedures so that they are no longer requirements. We have seen that happen. I guess anybody here has probably seen it happen one place or another.

MR. NEELY: I think the position we take is, as long as they meet Part 20 and have the "shalls" in the right place, if they want to put the "shoulds" in, as long as the program is working, then we don't have a problem with it, because what will happen, like you say, they will just take

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kap 1 all -- all "shoulds" in all procedures, and they're not
2 enforceable and people won't follow them.
3 MR. GREGER: Maybe they should have some of the
4 "shoulds" in procedures.
5 MR. GIBSON: Right. Maybe there should be some
6 "shoulds," but I guess I have the feeling that the
7 procedures are not adhered to as strictly as they should be,
8 and that is in part due to the fact that procedures are not
9 as well-written as they should be.
10 MR. NEELY: That's a management discipline at the
11 site. You take some facilities, the management will -- you
12 were talking about a good radiation manager. He develops
13 his program. It also depends on his site manager. If he
14 doesn't want any non-compliance, he's going to dilute those
15 procedures and put the bare minimum in. So he doesn't get
16 cited. But if he's a strong radiation protection manager,
17 he's going to insist that that procedure be there like it
18 is, to make sure that personnel have protection.
19 We have some plants where we have had to go back
20 in there and request they rewrite their procedures because
21 they just went through after we had an inspection and made
22 some citations, and took all the "shalls" out and put
23 "shoulds" in.
24 MR. MIRAGLIA: What can we do, then -- I guess
25 we're saying, basically, even if you have a good program,

good procedures, and good radiation protection officer or supervisor, what assistance can we give him in interaction with his management? Are our procedures and requirements perhaps too focused in areas that perhaps are not important to safety?

In other words, what requirements should have the "shalls" versus which ones should have the "shoulds"? Is our program defined well enough for us to recognize what are the important requirements, versus what are the level of details that, if they did deviate, would not have significant import?

MR. NEELY: I would like to go back to Reg Guide 133 again. There are two versions of that. There is the '71 version and there is the '78. Now, most of the older plants go with the 1971 requirement, and those procedures in their rad protection -- there's hardly anything in there, and it's up to the inspector to determine how he is going to apply it or inspect against it.

And if he's a new inspector and he's not strong, he's not going to go very far. But now, with the '78 revision which region one put a lot of time into, putting a broad area of procedures of air sampling calibration, from there we can now -- it's up to the inspector, through his training and office working, he can now develop the procedures you're talking about, this listing, to get the

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specific calibration for the portable survey meters, the constant air monitors, the whole body counter -- but now, at least we have another Reg Guide that expands further on rad protection, where at most, before, it was really built for operations.

MR. MIRAGLIA: Is this because the subsequent revision has some sort of grandfather clause in it?

MR. NEELY: No, it just expands on the types of procedures as a minimum you should have. It doesn't, like on the 1971 edition, I think it had radiation work permits, respiratory protection --

MR. WENSLAWSKI: Under radiation protection, I think it only had four descriptions, two or three were descriptions -- the new one is more detailed.

MR. NEELY: The '78 expanded it in all areas, rad waste and all of them.

MR. MIRAGLIA: The point I was trying to get to, Don, was the Reg Guide 133, Reg 1, if that's the case that was issued in '78, why isn't that applied to the old ones? Was that grandfathered? Was that previous 1971 superceded?

MR. GREGER: The tech specs haven't been changed.

MR. GIBSON: The tech spec references, the Reg Guide by date --

MR. NEELY: You have to go back and get a tech spec change.

MR. MIRAGLIA: How is that change instituted? Has the regulatory staff here in Washington, the licensing staff, said okay, made some determination that it should be backfitted and notified licensees for submitting an amendment to their technical specifications, or is that the way it is worded and being handled -- the burden being placed on the inspector to say, Hey, he does have this discrepancy, and do you, in your interviews with management then suggest, Hey, you should get your tech specs changed?

What is the mechanism there?

MR. GIBSON: We tried that very thing at Turkey Point and they told us to stuff it.

MR. GREGER: There's no reason why they wouldn't.

MR. WENSLAWSKI: You're never going to find a licensee who's going to volunteer to change his tech specs to something more restrictive.

MR. MIRAGLIA: So, it would then seem to me the next recourse would be perhaps for I&E to write to licensees saying, We feel this program is deficient in these areas, and in order for us to improve the program, you should direct —

MR. WENSLAWSKI: Then you are getting back to something we discussed before. I think you'll probably find the concensus in IE, a feeling that it would be a waste of time knowing that. It would take literally years, if ever,

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seeing that tech spec actually changed. The approach we usually take is to sit down with the licensee and try to reason with him, badger him into it, if you want to say so.

MR. GIBSON: That change would not be issued because of that letter. I could write that letter and nothing would happen.

MR. GREGER: I agree.

MR. MIRAGLIA: Even if you made the case that, for example -- I will use you as an example, Al. But we could say, I am a rad protection supervisor in region three and I have gone out and my inspectors have come to me and indicated that 10 out of the 12 plants that we are responsible for all have this old Reg Guide, and we are having problems with the programs of these things. And I sit down and write a letter to I&E headquarters, saying -- and I'm not doing it on a plan, I'm doing it at 10 of my 12.

MR. GIBSON: Right, and the answer would come back from I&E headquarters that we have discussed this with NRR and they agree that next time there's reason to change a tech spec, this item will be considered.

MR. WENSLAWSKI: For the same reason that Ollie was just talking about before, a tech spec change is a license amendment. You have to go through the whole thing, and people are not going to --

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MR. MIRAGLIA: So it's a resource. We'll get to it when we get around to it, kind of thing, because of the manpower and resources.

MR. MIRAGLIA: You can just cite that about hundreds of things within tech specs, not just this.

MR. GREGER: Now things have gotten much worse because if there's a very small tech spec change, for instance changing the reference to the Reg Guide, I guess the licensee has to initiate and they have to pay money to do it. It becomes extremely difficult to convince them to make any change whatsoever in their tech specs.

MR. MIRAGLIA: I don't know how long each of you fellows have been in I&E, but at one time the reason there were technical specifications, technical specifications were developed in the early years and provided for a change of tech specs that was less formal than it is now. And there was a change to the regulations back in '74 or '75, that said that any change to the technical specifications is an amendment to the license. And we got into the administrative procedure for changing tech specs before it was a less formal kind of thing.

MR. GREGER: I don't know how far back your experience goes, but is there a discernible difference in time as to how the thing worked before versus the way it works now since the advent of that rule change in '73 to '74? I don't know if any of you can speak to that.

MR. GREGER: We can see the difference just since the requirement has been imposed for a fee for every change. Two years ago, licensees were much less reluctant to make a tech spec change than they are today.

MR. GIBSON: I can see that change. And also, as our licensees gain experience in dealing with the regulators, they are not quite as quick to take our recommendations, I think, and stick their head in a noose for a more stringent regulatory requirement.

MR. NEELY: We had one licensee a couple of years ago that their procedures were in such bad shape, the types of procedures just weren't there to have an adequate rad protection program. We had to issue an immediate action letter and then we had to actually sit down with them and discuss what type of procedures they had to put in their program, and we had to make up a list so we would have something to talk from. And they turned up writing 100 procedures based on our discussions with them.

But if we wait for the tech specs to get a change and we have a program that was deteriorated and we needed

some immediate action, I guess I&E had to step out and actually -- you know, we don't tell people how to run their programs, but we were in a situation where we had to.

MR. MIRAGLIA: In other words, you had to get to the point where you had to at least document for your management that this step was necessary.

MR. NEELY: Yes.

MR. GIBSON: We have two immediate action letters on procedures outstanding at the moment, as a matter of fact. One we had a problem with the licensee that generally was not adhering to procedures, not coming very close to adherence. So we put out a letter requiring him to establish an internal audit program to ensure adherence.

And then we had another case where procedures were inadequate at Crystal River. These were effluent control procedures.

MR. WENSLAWSKI: Can I just jump back to something you asked about before? I don't believe we ever did discuss it, about management support of radiation protection programs. This really is pretty much a generic issue of production versus an overhead type of function. There is no getting away from it. I don't think there is any getting away from the fact that most management views the health physics program as a necessary function they support to the extent they have to.

I think most of the radiation protection type people would prefer more support from management and the operation type people. After all, while they are in the business of generating electricity and they are being slowed down by the health physics function, and naturally the health physics function takes an air as far as, let's expedite this job, let's get it done, you're holding us up.

I don't think there's any clear answer to that question. There is always going to be that overhead type situation in health physics functions and overhead type situations. It's something that has to be lived with. I think the ALARA program as called for in the Reg Guide states there shall be a management commitment to an ALARA program, and that's about as close as I think we can really get to it, is to require or at least have it in the guide that management has a commitment to the program. And how well they really commit to it in actuality is something else.

MR. MIRAGLIA: I think in the last few days of last week we conducted some depositions of the radiation personnel up at Three Mile Island, and we have heard that story, that management at TMI perhaps reviewed -- viewed the radiation protection program as operations oriented -- I mean, the management was operations oriented, and as a result some viewed the program of radiation protection as a necessary evil.

Is that something that would be a generic kind of thing throughout the industry?

MR. WENSLAWSKI: I can talk from having worked in the Navy program, and I think Al has the same background I do. When you have a production aspect and you have this side group, radiation protection, coming on trying to provide adequate protection at the same time, it slows down the production. And there is a heavy pressure to not slow down the production, let's get back into the operation type function. And I think you find in the Navy that Admiral Rickover has enough influence and he really puts the -- he makes it known that the radiation protection function shall have priority.

However, in the civilian industry that philosophy is not as strong. Well, it's hard to put it in words. I don't want to give the impression that management is turning their backs to it, because that's certainly not the case, either. But their number one priority really is, keep it on the line.

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MR. GREGER: You make a good point, Frank. You are saying, one, that electric utilities, nuclear power utilities, are electric power production oriented, and therefore they view the rad protection as a necessary evil. Then you talk about the nuclear Navy, when in essence it's really the same situation, where rad protection is still a necessary evil in the nuclear Navy. The name of the game there is to

get the repair work done or whatever has to be done, and again you have to put up with rad protection.

That exists anyplace except in a research situation, I believe, or anyplace that you're trying to do anything at all in, you have some radiation hazards. The difference is how strong of an influence is exerted in the nuclear Navy program, at least from Rickover, in the nuclear power utilities, either from management or from the NRC; how strong an influence is exerted to stress rad protection. I think we have seen a big difference in our region, at least, in the last few years.

I&E has become much more aggressive in the rad protection areas over the last two, three, four years, and the utilities have gotten the message: If they don't stress rad protection, they are going to end up losing in the long run, because they're going to be required to slow down production, to do major changes to the rad protection program. And because of that, at least in our region, we see a great deal of improvement in the utility management, in their views of the importance of rad protection. 1913 182

MR. MIRAGLIA: How can we as a regulatory agency foster this in management? The Rickover -- should we do it as a regulatory via enforcement or licensing?

MR. GIBSON: I believe it is the whole regulatory process. I think NRC has to provide the incentive. That's

where the incentive has to come from, and we do it through an aggressive inspection program and through stricter regulatory requirements.

I would like to comment that this is one area, while I agree it's a generic problem, I believe TMI is to the left of the bell curve on this. I think they were more heavily influenced by operations than most plants are. That's my opinion.

MR. NEELY: I support that.

MR. GREGER: It depends upon the strength, in many cases, of the RPM at the plant.

MR. NEELY: If the RPM is strong and the plant manager has a lot of trust in him, the RPM can also keep getting back on the line as fast as he can, then he is going to follow his advice. But if the HP staff, the health physics staff, has always been put down as holding up the jobs, so what they do is, the operations people step out in front of the health physics group and try to do things on their own, and they get in trouble.

MR. MIRAGLIA: Why don't we take a break at this point?

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(Recess.)

MR. MIRAGLIA: I think maybe we ought to leave the management area right now and maybe get back to it tomorrow. There are more general impressions that perhaps you fellows

would like to relay on the management. But let's get into certain areas that we could perhaps focus on a little better. The next item on the agenda is the training. I think if you fellows have read NUREG 0600, the indication that the TMI training program -- perhaps in the days of Unit 1, they did have some sort of basic radiation training, and there has been a general deterioration in the training program at TMI. And I think what we would like to do is elicit from each of you what your experience has been at the other utilities with respect to training.

Is this problem of staffing such that training gets short shrift at the utilities with respect to -- let's start with basic radiation protection programs. What's your view of the training programs that are in place at the various utilities within the regions?

MR. MURRAY: Let me comment on Region IV. I'll lead off on this.

When I do an inspection and I am looking at the area of radiological training, I am looking at basically two separate areas. First of all, I want to look at general employee training. This is the training that's given to anybody that comes in the plant.

And then, secondly, I'll be looking at the detailed training that the health physics staff people will receive for just health physics activities or their duties and

responsibilities. I think that it will probably go without saying that every plant you go into, the training programs are going to be set up differently. We will have some where they may try to accomplish all the training through lectures and a guide; others, they will supplement lectures with films that they have purchased from people that are in the business of making training films.

There is a requirement in 10 CFR 19.12 that talks about training, and that is about the only thing that has an inspector that you have to work with as far as a hard and fast requirement. And I look at that pretty much in detail to ensure that their training program complies with 10 CFR 19.12. When it gets into the area of training of the health physics staff, I notice that this varies quite a bit from utility to utility.

But one of the basic things that I look at here is, if they are bringing in somebody new, as part of their training program, that the health physics supervisors will acknowledge that this individual can perform or is familiar with the various procedures, the health physics procedures. So normally what it will be is a checkoff list. He may have a list of 20 procedures, and you go down through and the health physics supervisor will sign off that he has reviewed this procedure with the health physics technician and in his opinion the tech is competent and understands this particular

procedure.

That is normally the training as far as the health physics staff. This sometimes is supplemented with formal classroom instruction. But basically, in Region IV that is the training program. It falls into two general categories: general employee training that everyone gets, and the more detailed health physics training for the members of the health physics staff.

MR. GIBSON: I would like to say that I think NRC hasn't come close to really requiring or providing training to the commercial industry, the degree of training that I would like to see. That's my opinion.

I think that if it were not for the Navy, the commercial industry would be in sad shape. It has relied to a large extent on the Navy's training program.

We have some regulatory requirements, which Blaine just cited. But in fact, a utility can meet those requirements by just going through the numbers. We haven't provided or required, because I was -- well, okay, we haven't required training.

I believe a utility can meet the NRC training requirements and still not provide very meaningful instruction to radiation protection people. I don't think they are quite as bad off when it comes to training radiation workers, radiation protection people. You know, the utility can cover

all the required bases and HP techs still are not provided much in the way of meaningful training.

I would like to see NRC, one way or another, substantially upgrade the training of radiation protection people. There are a number of options to be considered. One of the options that's under consideration by Standards is to certify HP people, for NRC to certify or to require the American Board of Health Physics to certify.

An option that hasn't been talked about too much which I think has a great deal of merit is for NRC to provide the training, to establish a school, which could include a simulator for operator training and the like, and it could be a school that is at no cost to the agency. It could be required for training, with the tuition paid by the utility. But I would like either that or it could be some commercially, some training through some college or university set up in accordance with NRC specifications.

But I would like to see us do a great deal more to provide radiation protection training to health physics people in the industry.

MR. MIRAGLIA: Can I take it, then, based on your comments, Al, that basically what you have seen or what we have seen at TMI is probably not atypical with respect to training?

MR. GIBSON: I think that's fair to say.

MR. MIRAGLIA: So with respect to a bell-shaped curve as far as industry goes, would TMI be in the middle of the curve?

MR. GREGER: I don't think so. From what I have seen, TMI is far down on the bad side of the training curve, at least with rad protection technician training. I'm not that familiar with what they did with respect to 19.12 training requirements.

MR. NEELY: From what review I have done of the training program at Three Mile Island, I feel that they -- and these are preliminary findings. They did not meet their FSAR commitments, nor did they meet their tech specs.

MR. GIBSON: In effect, they didn't do any training.

MR. NEELY: It wasn't started, in fact, until last year. They built a new procedure and that procedure hasn't even been accomplished.

MR. GIBSON: Right, they haven't followed that one yet.

MR. GREGER: There was a good point brought up by both Blaine and Al. What are the training requirements NRC has? We have 19.12.

MR. WENSLAWSKI: There's a new reg guide that just came out, a draft proposed reg guide.

MR. GREGER: So now we have 19.12 and we may have a reference to N18-1. Those are the only things that we have

that I know of that require any training whatsoever. 19.12 doesn't require retraining of people, doesn't require qualification testing. All it requires is that you inform people of certain specific items before they go into restricted areas.

MR. GIBSON: There's a new reg guide out on training workers which I haven't studied too carefully. But it looked like it's pretty good.

MR. WENSLAWSKI: That's the one I was talking about.

MR. MURRAY: It came out last week or the week before.

MR. WENSLAWSKI: It's out for comment.

Can I just give my opinion of training? I'll break it down, what you call basic radiation protection training for employees in general. Again, to echo what's already been said, 19.12 is the basic guidance that everybody follows. There is a new reg guide that comes out that looks like it will really be a help in that area.

I think generally you can get an idea in the regions how well the training to employees is by the number of allegations or inquiries you get from employees. You get a call during an inspection or a call in the office from an employee who doesn't -- you can tell they really don't understand the program just by the types of questions they ask about my exposure to this, is this a problem, they told me I had this. Moreso in temporary employees who work for a short period

of time, and they don't get their report of exposure and bioassay results, and they're asking questions.

But that, at least in the experience of Region V, are isolated calls. We don't get too many of them, I think, which speaks fairly well for the training program.

I think the training program at licensees is usually pretty well structured for general employee training. It is pretty well laid out exactly what they will do, and it's fairly easy to inspect against what they are doing. The training for radiation protection technicians is something else again.

That, I think, is going -- if you went from one plant to another throughout the country, it's going to be customed to the needs of the plant. I think as a general rule most utilities try to hire experienced technicians. And as they already said, a big source of experienced people is the naval reactors program.

I think beyond that what training is given is going to be peculiar to the needs of that utility. Some of them might provide some kind of structured training program required of people to go through so many hours of classroom training, have a certain amount of on-the-job type training. But I think that's really what it really comes down to -- a lot of on-the-job training.

I think one thing we found out from an experience

at Trojan -- and I think this is probably generally true -- that there is not a whole lot of training in the area of systems, reactor systems, such as a technician going down to cover some job on some system and he really doesn't understand the system, how it operates, what its function is.

And this resulted at Trojan where some people were exposed to a fuel transfer tube and they didn't realize it was a fuel transfer tube, and a result of that -- one thing PG&E is doing there, or did, was to develop a training course more in the reactor systems itself, so that technicians are familiar with the hardware. And I think that's an area that might be generically lacking.

MR. MIRAGLIA: Is there any effort to get that on a generic basis?

MR. WENSLAWSKI: I'm not aware of any.

MR. MURRAY: One thing you have to realize, when you go to a licensee or a utility and you talk about training and the reactor, the first thing that comes to mind with them is reactor training of licensed people. Training of non-licensed people, unless it's stressed, just doesn't exist. You know, typically, you're going to have a training coordinator and maybe one or two assistants at a plant. And usually the training coordinator is going to be a licensed SRO.

And unless they have somebody in the training group

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that maybe has come up through health physics and got into the training group, that the training for health physics is going to be kind of weak at the utility. And there's just not much -- that's not just only in the area of health physics, but maintenance, INC, all of those: not much time and effort devoted to training.

MR. GIBSON: When the investigation team finished with TMI, we felt there was a need to substantially upgrade training. But when we tried to enforce that through the regulatory requirements, we couldn't find anything that was

e4 of much use to us.

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MR. GREGER: In Region III, out of 13 reactors we've probably got one or two as bad as TMI. I think on the average they're better than TMI. But if you look at the ones that we even consider good, they may implement their training program of rad protection technicians now in many ways. One plant may send people away to courses. Another plant may have formal instruction where they take people off the job and sit them in a classroom situation with their oldest directors and teach them. Another plant may do it by just on-the-job training. And with the different methods you can still come up with different success ratios.

A good plant may pursue one, all, or maybe none of those methods to come up with a well-trained radiation protection staff, but there are no real hard and fast requirements, no real hard and fast guidance. Maybe this new reg guide has one.

MR. WENSLAWSKI: That's just for general employees. There's nothing anywhere that describes the training necessary for a technician. I think — what's the guide on qualification? ANSI 18-1. That talks a little bit about qualification, years of experience. But as far as anything — everything is —

MR. GREGER: There's no guidance that talks about subject type of material rad protection technician may be exposed to.

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MR. LYNCH: How about practical factors test?

MR. GIBSON: No, it doesn't require it. Well, it's not always -- not often done.

MR. GREGER: It may be done. Depends upon the plant.

MR. NEELY: Some of the plants won't even issue examination because of the unions.

MR. LYNCH: Is that a big problem?

MR. GREGER: Yes.

MR. GIBSON: I would really like to see NRC do something that is maybe a change in its process in some way, maybe in this area. Maybe licensing HP techs similar to the 10 CFR 55 requirements is an option. And I would certainly like to see NRC do something other than send it to committee for 15 years of study. I don't see why we couldn't come to some decision and do something within a year.

MR. YANIV: When you advocate licensing, it's obvious you advocate the managers, the supervisory. But are you thinking all the way down?

MR. GIBSON: I was thinking of the technicians at the working level.

MR. MIRAGLIA: You could have different words. Like you have senior and just operator.

MR. YANIV: You would advocate that NRC license down to the junior technician?

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MR. GIBSON: That's my initial reaction, but I don't want to come across strong recommending a particular alternative. I think there's more than one way to get there. One way is to license individuals. Another way is to require very specific training and examination, either training provided by the NRC or training specified by the NRC and provided by someone else. Another way would be to recognize a certification by some independent group, which I think is the weaker alternative.

MR. NEELY: I think as far as Region I training programs, Part 19 is pretty much what the inspector -- how he inspects against it and what he can get out of that program. If he feels, well, they are meeting their bare minimum, and he knows he hasn't got too much to work with, that's what you're going to go away with. If he sees, well, they've missed a certain topic out of Part 19, then he would make the citation or whatever he would have to do to get management's attention.

A lot of the Part 19 training is only specific to the plant while it's operating. It doesn't speak to when the plant goes into maintenance or refueling, whether the houses are really there, as far as ALARA and these type of considerations should be applied.

The rad protection staff and the power plants, we have one facility where the tech spec didn't even require a

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training program for techs, so they went on for years, and subsequently we have had to take strong enforcement against that line licensee, since the rad protection program was similar to Three Mile Island. You looked at the total program, and that's what it was: the technicians didn't know how to do their job; they didn't know how to follow up procedures because they weren't trained in the procedures.

MR. MIRAGLIA: On the whole, Don, Region I, you would say TMI is not that atypical, then?

MR. NEELY: They are at the bottom in scale. They are -- there's one other plant that is similar to their condition; they have part of the same system.

MR. DIENELT: The same system being Met Ed?

MR. NEELY: Yes.

MR. MIRAGLIA: You mean it's in the GPU system?

MR. NEELY: Yes.

MR. MIRAGLIA: One point that you raised -- there's a couple of other points that I would like to get to -- but one point you raised is the problem with unions. Is this a significant problem in all the regions regarding unions as far as training?

MR. GIBSON: I have seen it at Duke Power. They tried to set up a program of A, B, and C technicians; and when a technician passed his qualification exam, he could advance to the next step, which meant more pay. And the

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unions blocked that for some reason.

MR. MIRAGLIA: At TMI is the union a problem with respect to training, and is training being weak?

MR. NEELY: Not TMI. The technicians, essentially, they want the training, but it's just not being provided -- I mean, the time. Management has set up the scheduling, how they're going to do it, but it just hasn't -- the lastest procedure which covered training hasn't been implemented. There has been one out of 22 cases where there's four entries made on his training form.

TMI doesn't have a program for training the techs in procedures. We still see it today happening out there. The procedure comes in -- I was following up on an immediate-action letter, and the procedure ends up in the file, and some of the technicians didn't even see it. So how do you expect them to implement it?

They are not required to sign off on a sheet that they read it, they understand it. The main innovations coming through.

MR. GREGER: That's poor management.

MR. NEELY: That's right. Most plants have that, where your procedures are part of your initial training that you read all the procedures, you sign off, revisions coming through. It's built in. Again, that's the inspection program to make sure that's all there.

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MR. MIRAGLIA: I have two questions in mind with respect to TMI, and I would like to find out how typical TMI is to the rest of the commercial sector out there. At TMI, as I understand it, the basic responsibility for training, not only the general employee training, but also the training of their own technicians, fell upon the responsibility of the rad protection department, as opposed to having some group within the training department implement the program. In other words, have some resources available at which the training would be followed in the normal activities.

MR. NEELY: The training program at Three Mile Island is that there is a training coordinator. Essentially, what he does is maintain the records and computer printouts when they are supposed to requal or things like this. But it's the rad protection supervisor's responsibility to make sure that his people are trained in accordance with their tech specs, FSAR, whatever.

MR. MIRAGLIA: Is this typical for all the utilities in Region I?

MR. NEELY: No, there are some utilities in Region I where the training department sets up the criteria and schedules the training, but it's approved by plant management through the rad protection department. They're not going to make up their own training programs. But the

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rad protection department just makes sure the people get there. There's a two-year retraining program. Then their names come out on the computer, and the training department takes over.

MR. LYNCH: Does that work better?

MR. NEELY: Yes.

MR. LYNCH: It's effective?

MR. NEELY: Yes. What happens, the rad protection supervisor is so involved in the plant and the program because of the needs of the operations staff that he is responding to those things and these others are peripheral duties.

MR. MIRAGLIA: What's the majority of the utilities' approach to training in Region I? Is it through the training department usually?

MR. NEELY: I would say at least 50 percent of them go through the training department.

MR. GREGER: For scheduling or training?

MR. NEELY: Even for training, they may pull their rad protection man out to do the course.

MR. GREGER: I would say that's typical for Region III. I can't speak in certainty, but I feel that in most cases the training department is used as schedulers, provide classrooms, maybe come up with a list of topics that should be covered by the rad protection people in retraining. But

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for the most part, retraining and initial training of rad protection techs is handled by the rad protection groups themselves, and I don't necessarily see a problem with it. It can be done extremely efficiently, assuming the rad protection group themselves wants to do a good job. The rad protection manager.

MR. MIRAGLIA: I think we can agree basically there is no firm requirements that outline some minimum acceptable requirements for training.

MR. GIBSON: Of rad protection.

MR. MIRAGLIA: Of rad protection people. That's number one. I guess you have several alternatives just now the management can implement their training program.

MR. GIBSON: I, for one, would again like to say I wouldn't want to see this problem solved with a couple of sentences added to a tech spec or a new reg guide developed. I think we would need more positive action than that.

MR. MIRAGLIA: With respect to the alternatives we spoke of, either certifying or approving a commercial facility to do this, or NRC actually being involved in the licensing similar to what we do for operators.

MR. GIBSON: Right. Or NRC actually providing the training, set up an NRC school, and maybe send not only utility people but we can train some new inspectors there.

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We are also relying on the navy for training inspectors, and we are drawing from the industry, that is short on qualified people already.

MR. NEELY: I think you can take that one step further, too, because a lot of the plants because of demands put on them by regulatory agencies are having to go outside for additional staffing. You may have a plant that has 20 technicians that are fully trained out because of new regulatory protection requirements and these other associated programs they go outside to the rent-a-tech companies, so now they bring their rent-a-techs who, the only experience they have is what they gain from going from plant to plant, and it's not really a program training.

So, you've to tie those into it as well, because during refueling those are your biggest problem areas.

MR. GIBSON: Right. And a person is considered qualified if he has the right number of years of experience and that could be years of bad experience that perpetuates itself.

MR. NEELY: That's right. During a fueling, if you come out with, say, a lot of noncompliance and the program, the station or licensee, has had a good enforcement history and you stand back and look at why that happened, it's usually because of the contractor that came in and supplied the services, the type of training they got when

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they came on, and their experiences.

MR. MIRAGLIA: And the regulatory program is not such that you can expect some minimum training of contracting personnel, either.

MR. NEELY: It's not. The inspector has to really enforce that when he goes out for his pre-refueling or whatever, what kind of training are you going to provide, what are their qualifications. The ANSI standard is not really clear on the qualifications. What's the responsible position. You know the technician is in a responsible position; does that mean he's going to stop the jobs or he's going to write RWPs? It's not really crystal clear, and it's up to the inspector how far he can take that program.

MR. MURRAY: In this section here, Frank, are you mainly addressing the training for the health physics staff or the training of general input?

MR. MIRAGLIA: I think that's the focus of what we're interested in, the rad protection technicians.

MR. LYNCH: It was accidental that I used the word "basic training." However, I am glad you guys picked up on "basic" as well, because 10 CFR 19 training is also important, and I didn't put that in there because we're concentrating on rad protection. But it is important, and I should have.

MR. GIBSON: Rad protection people are sadly

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lacking in basic training on internal dosimetry and shielding and bioassays and all of that.

MR. LYNCH: That's what I meant. But the other one is important, too, and it slipped my mind.

MR. YANIV: You are suggesting as one alternative an establishment of an NRC school or something like that, that it would even be used to train NRC staff. How would you fit into this general scheduling, in your mind, the existing academic programs which are at various levels, from community college level all the way to doctorate?

MR. GIBSON: I think what we need is not an academic environment. I think what we need is instruction by people who are in touch with the practical reality of what's going on in the power plants. We don't need people who teach from a textbook who have not worked in a power plant. We need people who can say when you work on a control rod drive on a BWR you are likely to get water in your face when you remove this component or that. We need people — instructors are going to be hard to come by, too — but you need people who not only have good understanding of basic health physics principles and the current regulatory guidance, but who also understand what's happening in power plants and can be practical in their instruction, and I don't think very many colleges and universities right now have that kind of talent available.

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MR. YANIV: But how is that different, let's say, from a nuclear engineer that's being trained in a university?

MR. GIBSON: A nuclear engineer who's being trained in calculus and heat transfer in a reactor cold water and in French and English composition, and what we need is something closer to nuts-and-bolts training.

MR. LYNCH: Vocational training.

MR. GIBSON: Right.

MR. LYNCH: Hands-on.

MR. NEELY: Somebody who can relate to the actual problems.

MR. YANIV: They are quite recent, but there are four-year health physics bachelor-level training.

MR. GIBSON: Yes. Right. And I think some of that training is good --

MR. GREGER: We're talking technicians.

MR. YANIV: He mentioned also inspectors.

MR. GIBSON: I think -- you know, I don't want to discount the value of an academic education, but I think we need that plus we need the practical aspects of running the HP program. We need, for example, I think, to instruct the students from the reg guides, you know, Reg Guide 1.109, when you release 1000 curies per second out the stack what kind of dose is being produced out here, what is chi over Q,

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anyway?

MR. YANIV: So, for an inspector, you would take a guy who got out of college, whether it was a bachelor's or a master's degree in health physics, and put him through a kind of internship of six months to a year.

MR. WENSLAWSKI: The people you're talking about, the majority usually have a bachelor's or master's degree. What they actually have -- the majority of them would be navy career technicians.

MR. YANIV: I was not talking right now about technicians; I was talking about supervisory position or NRC inspector.

MR. NEELY: NRC inspectors, if they come out with degrees, like in our office, we have several that are interns and they serve as interns for one or two years under supervision -- not supervision, but guidance of a senior inspector.

MR. GIBSON: Yes. Kind on instruction that an NRC inspector in turn needs is instruction on how is an HP program managed in a power reactor, what kind of procedures are necessary to run a good program, what are the NRC regulatory requirements, and what do the reg guides say. This kind of thing. You know, it could be part of the school, as well.

MR. LYNCH: A basic question here that Shlomo

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opened the door on that I would like to see if we can get an answer here. In your experience dealing with the technicians in various utilities and health physics staff, how effective has the training been from the academic availabilities? Now, there are certain courses that are offered by certain colleges in certain city colleges. How effective is that in providing well-trained people versus the navy's program where we seem to be getting the prime source of well-qualified technicians?

MR. MURRAY: First of all, there is not that many courses, academic courses, available that you can send -- a utility company can send a technician to, I don't think. Usually, at a utility you are going to find the person that's probably the most academically qualified is probaoly heading up the chemistry and health physics program.

I know, in Region IV, I have stressed training, and usually they will try to set up some type of a formal training program with the chemistry and health physics supervisor as a lecturer. But usually what happens is that he has so much to do that he just cannot devote the time and effort to get an organized class set up and give the training, bring his people in to sit in the classroom and give the training.

Now, as I perceive things in the area of health physics, for it to get better there is going to have to be

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pressure placed on the utility. There they have a training program that is similar to their licensing training program. It's required training.

I know, in a couple of plants in Region IV, when positions have come open in the training department, that I have encouraged them to get one of their good health physics techs and put him in the training department, where it is stressed as far as health physics training. But it's very difficult just to, first of all, find the people at the plant that can take the time to give formal training and, secondly, to get the technicians to come in to sit down to two or three hours of formal training. It's very difficult unless the requirement is put on the licensee that you have to do it.

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MR. NEELY: The last few years we've had at least three plants in Region I do escalated enforcement. We've requested that they place their technicians in training programs, and this has been done by consultants coming in on a 30 day program and with people that have hands-on experience, instructors, as well as a certain amount of academic background.

MR. LYNCH: Has that been effective.

MR. NEELY: Yes. That's the Pilgrim station, Oyster Creek, and Indian Point. Those are three plants that have gone into extensive technician training programs by consultants, and they give a guy enough spectrum that I think he can -- for some people, it's retraining. But most of them, they are learning things that they didn't know about, and it goes under regulations as well as doing their job. And in those plants this is not -- the leading plants -- we're now looking at pre ops -- before they get their license, but the other plants, it's not there.

MR. MIRAGLIA: With respect to training, I get the impression from looking at TMI that the emphasis was on maintaining training records and documenting that certain training was given. The bulk of it, as was quoted, was on-the-job training, and there appeared to be a lack of quality assurance check as to what the adequacy of their training was, what the course content was, what principles

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and fundamentals were covered. Is this a problem?

MR. GIBSON: This is a problem.

MR. MIRAGLIA: It was a problem at TMI.

MR. GIBSON: What you are seeing here is what you will see if you will look at an I&E inspection results. It appears that we are emphasizing documentation, when in fact it's the document that's about the only tangible evidence we have that the program isn't working right. It's hard to build an enforcement case, saying that management is not committed to a good training program. It's hard to build a case that the instructor didn't cover all of the things he was supposed to cover in class. It's easier to say the record is incomplete.

MR. GREGER: I think that's a good point. In this case in particular, I think the problem is accentuated because there are no hard and fast requirements for particular types of training. So if I go in to do an inspection, I want to see a training program in effect, and I want to see some evidence that they have conducted training for the technicians. But beyond that, I am a bit in the dark as to exactly what type of training the techs should get, so in most cases I stop after seeing that they do maintain records, and I can look and see they have conducted training once a week, every single week of the year. And my assumption is, that if they have conducted

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2 about something they should be talking about and instructing
3 the people.
4 MR. MIRAGLIA: I guess the point I was getting to
5 is besides having specific requirements for training and
6 specifying certain minimum requirements for training, would
7 it also be important that there be a requirement for some
8 auditing by the licensee, perhaps --
9 MR. NEELY: It's required in the tech specs of
10 most plants that they audit.
11 MR. GREGER: If they have procedures that require
12 training, they have requirements to audit the implementation
13 of those procedures.
14 MR. MIRAGLIA: At TMI, that didn't seem to be the
15 case. And what I'm trying to get at -- is, again, that a
16 typical kind of situation or, again, is your experience
17 varied? Is this an area that can be improved upon, either
18 via requirements or enforcement?
19 MR. GREGER: Were there specific train.
20 requirements at TMI?
21 MR. NEELY: At TMI, in fact, I have been pursuing
22 that area. The tech specs require that the station -- the
23 entire station staff -- their qualifications and training be
24 audited once a year. That hasn't -- I can't find any
25 records at Three Mile Island that that's been done in the

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last two years. Now there may be some documents somewhere we can't get our hands on, but to this date, they can't show us any evidence where they met their tech specs.

MR. DIENELT: What do they say in response to any questions that you ask about where the documents are?

MR. NEELY: Well, they'll tell you to go talk to so-and-so or somebody else. Right now, we've just put that on the backburner, because right now there are more serious things going on out there.

But that was part of my request when we were asked to submit comments to the starting up of Unit 1, that all this training be done prior to startup and that they get their audit program in order.

MR. DIENELT: As you understand it, that wasn't done. They didn't do their training prior --

MR. NEELY: We reversed an immediate action issued July 18 that they implement a QA program, and part of that program is to cover training. And that program is supposed to be implemented by the end of this month.

MR. MIRAGLIA: Is that the kind of tech spec, though -- that's a spec at TMI and would be a spec at the other facilities?

MR. NEELY: In most plants it's there.

MR. GIBSON: No, I don't think so. What we have pushed for in times past without a great deal of success is

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to include radiation protection under the applicability of the site QA plan, and if it is under the QA plan, then audits of it are required and training of the people is required and documentation of a lot of things is required. And maintenance of the survey equipment and such is required, and we have a great deal -- I think it formalizes and strengthens programs.

Unfortunately, NRR has not considered radiation protection to be a required item on the Q List, which means it is not safety-related, and some licensees have, on their own initiative, included it, but most have not. I think if radiation protection programs were included on the Q List, we would see some improvement in several of the areas we're talking about today, including auditing.

Nearly all the tech specs in Region I I read say qualifications, staffing, and training of the entire staff once a year.

MR. GIBSON: Okay. I'm not familiar with it.

MR. GREGER: I'm not familiar either. A specific requirement to audit those requirements?

MR. NEELY: Yes. It's like the port committee -- not the port, the corporate comes in and does it.

MR. MURRAY: That's a pretty much standard tech spec.

MR. LYNCH: I see we look at the documentation to

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see whether or not the training has occurred, and the documentation that says what the training ought to be, what is the curriculum, et cetera. Is there any looking at the performance as a result of that training? Is there any way to do that?

MR. GIBSON: Not in our existing program. There's nothing established for that.

MR. LYNCH: A new program?

MR. GIBSON: Yes. Inspectors could go out with a list of questions. You could give inspectors 2000 questions with instructions to ask 50 of them during each inspection or something like that.

MR. LYNCH: Would that be of utility?

MR. GIBSON: What do you do when they give you the wrong answers?

MR. WENSLAWSKI: I can't help thinking of the radiography industry in everything that we're talking about here. I don't know if you're familiar with that, but there NRC has pretty well made out very clearly to licensees and applicants for licenses what the training requirements are for the radiographer and the radiographer's assistant.

Thereto, there has been a lot of discussion in the past about consideration given to such things like Al mentioned qualifying radiographers -- perhaps giving them some kind of examination, and that idea has been rejected in the past.

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MR. LYNCH: Why?

MR. WENSLAWSKI: I really don't know why. Perhaps because it would be an administrative nightmare for NRC.

MR. LYNCH: Are there other programs that use on-the-spot questioning or examination?

MR. WENSLAWSKI: That's an area where I believe there is on-the-spot questioning of any radiography during radiography inspections, where an inspector will question a radiographer regarding various aspects of the operation and try to get a feel for how well the guy is trained. It is done.

MR. LYNCH: Is it done in any other "nuclear" industry -- naval or otherwise?

MR. GIBSON: We, in our inspection programs, do question radiation workers. We say, "Do you know what your exposure limit is? Show me that you know how to read your pocket dosimeter. What is your accumulated dose for this quarter? Had anybody briefed you before you went in to do this job."

MR. LYNCH: How about the radiation protection staff? Do they know how to use the instruments, et cetera?

MR. WENSLAWSKI: I think that arises, to some degree. You really can't avoid going on an inspection, talking to people, without questions of that nature coming up, where the inspector starts getting a feel for the

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qualifications of the person he is talking to. Certainly, I think, across the board, if an inspector is inclined to think that the guy he is talking to doesn't know what he's talking about, he's going to pursue a line of questions with that guy, intended to find out how well the guy is qualified. I think that's inherent in the way inspectors do business.

MR. GREGER: I would agree. But typically we talked to very few of the total complement of rad protection technicians at a plant, and the ones you do talk to are probably the more senior technicians, because they are the ones who are able to answer your questions.

MR. LYNCH: How about on the backshift?

MR. GREGER: Again, you'll probably have one of the more senior technicians on the backshift. Probaly my biggest question in this whole area is, I don't think I know from my plants how much the rad technicians really do know, because we have never been in the position of going out and across the board to all the rad protection technicians, asking them a series of questions which would allow us to know how competent they are to conduct their jobs.

MR. WENSLAWSKI: Let me just make the point I wanted to make about radiography. If you guys are somewhere going to be making recommendations about training, I would suggest that you get in touch with NMSS, because that has

been -- the questions we are talking about here, that whole arena has been discussed specifically for years in the area of radiography, and I don't think we should go off in different directions, because radiation exposure is radiation exposure, and radiography is whether it's in the nuclear power reactor. And the issues that have been raised on nuclear training qualifications, how do you know their qualifications?

We've been down that same road before in radiography. To my knowledge, the answers haven't been bad. The over exposures keep on occurring. The point I want to make is that I think you ought to touch base with NMSS and maybe talk with some of those people -- how radiographers are handled.

MR. NEELY: In Region I, there is one area where we do. We question rad protection type people, and that's on the backshifts where their tech specs require that they have a person qualified in rad protection procedures. You take the plants that do not have 24 coverage. Now the auxiliary operators or -- there was a bulleting put out some time ago telling the licensees what they have to be trained in to meet that requirement for persons qualified in rad protection procedures.

As part of the inspection effort, the inspectors go out in the wee hours of the morning or late at night and go on

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the back shifts and inspect and then actually determine how the people demonstrate that they can meet that particular tech spec, by taking a survey meter and making surveys, posting areas, taking air samples, calculating the air sample, this type of thing.

If we find a situation where they can't meet it, then you go to the shift supervisor. You call the plant manager, and you request that they get into compliance. Either they have to bring a rad protection man in from home, or there are other actions to take -- or ask them to bring the reactor down, whatever.

MR. MURRAY: In Region IV, one of the things in my inspection program that I've always insisted on is that they're be some documentation that the health physics technician is familiar and understands the procedure, the health physics procedure, and this usually takes the form -- you bring somebody in off the street so to speak, and he goes through the easy procedures, and when his supervisor feels he's competent in that area, then he will acknowledge this by -- he'll have a list of procedures, and off on the side he'll say, he's competent to do this.

One of the things I normally do is I'll tell the health physics supervisor, "I'm going to be talking to a couple of your people. First of all, I want to see your training records. Okay, this guy, his records indicate that he is --

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that you've signed off on his for Procedures 1 through 10." So I'll pick out one of those procedures and bring the HP tech in and maybe some calculations of MPC, how you take an air sample, how you do the calculation down to how you prescribe for respiratory protection devices.

That's one of the things that I look at. In this whole area, you know, as Al and Bob and Frank have mentioned, there's nothing really that specific. I think in a lot of cases it boils down to what the individual inspector requires of the licensee.

I would personally rather see it take the training -- maybe be an appendage of the operator training. You know, you have some hard and fast requirements there for licensed operators at the plant. Why can't you do this in the area of health physics also?

MR. LYNCH: So you advocate licensing of HP techs, too?

MR. MURRAY: Something similar. I think what you're going to find is there's been a lot of time and effort devoted to this establishing the operator -- this requal program. Why couldn't you have something similar to that in the area of health physics, because I think that's the route they would go. You've already got the training coordinator. The only thing is is that all their time and effort is spent on operations. If you had somebody on the

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training staff that was a healthy physicist, then you could accomplish the same thing in the area of health physics.

MR. MIRAGLIA: What is the situation out there with respect to requalification and retraining?

MR. MURRAY: On operators?

MR. MIRAGLIA: On rad protection.

MR. GIBSON: There is a requirement referenced by, was it Reg Guide 1.8? What is it? ANSI 18.1? ANSI 18.1, which is referenced by one of the Reg guides. What is it, 1.1, which lists about eight topics that the "operating organization is to be retrained in." It does not specify frequency for the retraining.

If you do a Philadelphia lawyer's review to determine who the operating organization is, we can come to the conclusion that it does include radiation protection people. But it's a pretty weak requirement, because it can be met by an instructor standing up and in 30 minutes time covering the ten topics once every find years.

Now we did cite TMI for not meeting that because they hadn't done anything, but what I am saying is, any utility can meet that requirement with minimal effort and no meaningful training.

MR. GREGER: I think typically, though, you will find most utilities will conduct some sort of retraining on a continuous basis, trying to cover certain topics once a

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year, maybe once every two years at the very most.

MR. WENSLAWSKI: So what you're saying is, TMI would be an atypical situation?

MR. GREGER: For not having conducted any training at all, I don't think anyone would doubt they're atypical in that situation. The problem is amongst other plants, there is a great deal of nonuniformity as to what training is given because, again, there are no real hard and fast requirements.

MR. NEELY: Some utilities have very good ones. Some have extensive pretraining programs and requals. It all depends whether they come out on the navy program, and the RPM is pushing that, or it's an old utility.

MR. GREGER: I guess one problem, if in fact the NRC does go to the point of licensing rad protection techs, which is being discussed a great deal and which probably is beneficial, one has to determine how many rad protection techs you need — obviously how many need to be licensed. They don't all have to be licensed. So you have to have people in training. There are probably different degrees of licensing that are necessary. And that's the same problem we run into when we go out to try to enforce, let's say, experience requirements of ANSI N 18.1.

It talks about responsible technicians must have so much training. What's a responsible technician? Unfortunately,

that's not defined anyplace.

MR. NEELY: Does it all have to be 18.1 qualified, or just half of them?

MR. LYNCH: You indicated another interesting thing -- that the plants you are having trouble with are old licenses. What's going to happen eight, nine years from now when the plants that are newly licensed become old licenses?

MR. NEELY: It's not goint to happen as long as we get some Reg Guides and regulations that you don't have to call up the legal people and have them interpret for you, that the inspector can enforce against it. You're not sitting out there in management meetings listening to their position. Then you're back and forth inspection reports are unresolved items.

MR. GIBSON: I do think, though, that we can sit here and predict that licensees have become less cooperative as they gain experience in dealing with us. And I think based on that we can anticipate that they're going to be less cooperative ten years from now than they are right now.

MR. LYNCH: Unless what is done?

MR. WENSLAWSKI: This situation is different in that ten years ago essentially there was no guidance. I don't even believe that a licensee had to describe anything in his SAR about radiation protection ten years ago. Now there is an enormous amount that he is on the hook for.

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It's in his SAR, and he is committed to it. And there is that difference we have to recognize.

MR. GIBSON: I think the resentment and lack of cooperation comes from the fact they believe they're being overregulated, and because of that, they resist any additional requirements being placed on them.

MR. GREGER: Let me add, I think I agree totally with what's being said. I don't think we're going to have the problem that we have with old plants now, because again, the old plants, you didn't have the requirements and you're trying to impose requirements on them, and they say: We've operated for X number of years this way and we've never had a problem; why in the world do we have to do something different?

I don't agree so much with Al. I don't see, at least to the extent I seem to get the impression from you, that plants in our region, in my Region III, are becoming difficult to deal with because they become more experienced in dealing with us.

I think they have become reluctant to accept dictated positions without logic and reason behind it. I agree with that. You can no longer go into a plant and say: This is what you should do, and have them run off and do it. Now they are saying, why, tell us why. One, tell us why we should do it to have a better program; and maybe, if they're a little difficult, they'll say, and also tell us what would force us to do it.

But most of the plants, if you have a good reason for your request, unless it's a great imposition on them, will go along with it, even though there is not a hard and fast requirement, regulatory requirement, that he do so.

And the reason for this is not necessarily altruistic on their part. They know that even though there may not be a hard and fast requirement, there are other things that we can do that would cause them trouble in the long run, whether it's with state rate commissions or whatever.

Our opinion is sought after. It appears in too many places for them to totally ignore us, if we have a valid basis for requesting them to do something. So I don't see the reluctance amongst our plants, as long as we come up with that valid reason for doing something.

MR. GIBSON: Well, I agree with you to an extent. I guess what I'm saying is that a more experienced licensee is less inclined to make a commitment to take some additional action. But I think we are saying the same thing: The more experienced licensee says, show me, and show me -- like we have one licensee I can think of where, at the interview, the plant manager just says two words. He says: Show me the requirement, show me the requirement. And we don't get much of a commitment out of him unless we can show him a requirement.

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And that's because I think he feels he has been ratcheted to the point where he is doing a lot of things that are not required.

MR. MIRAGLIA: I think that identifies something we might want to save until tomorrow, and I'll just throw it out

on the table. We might want to discuss it now or not. You can get your thoughts together through the evening.

Are there requirements that we have imposed upon licensees that shouldn't be there and that are diluting the efforts to focus on important aspects of safety and radiological protection? That is just a rhetorical question.

You mentioned something, Don, that I would like to follow up on. It's on the back shift. It's not necessarily a radiation protection person who has responsibility on that shift, but someone who meets some sort of minimum criteria as being trained in radiation protection. Is that a normal situation at facilities? Does it vary? What are our requirements with respect to radiation protection personnel on site, minimum requirements, et cetera?

Is that varied? Is there a standard tech spec on that?

MR. NEELY: It's a standard tech spec that they have a person qualified with rad tech spec procedures on site when fuel is in the reactor. That's pretty standard, from all I have seen.

I could probably think of three or four utilities just off the top of my head in Region I that do not have shift coverage 24 hours a day by radiation protection staff members, that after 5:00 o'clock or 4:30, when they leave the site, it becomes the operations personnel responsibility to

meet that tech spec requirement for radiological conditions at that plant.

MR. MIRAGLIA: Is there usually an auxiliary operator in that function?

MR. NEELY: It can be, because the licensed operator is already burdened with the fire protection aspects, and their own operating and controlling. Usually they will train some auxiliary operators who are already moving around at the plant, to provide that function. And most of the plants have generated procedures specific to meet that requirement. It's kind of a simple procedure here. Just plug in numbers and here's how you do your example calculations. You get this result, then you're going to have to call for on-site assistance.

MR. MIRAGLIA: Is that pretty much standard throughout the regions?

MR. GREGER: I know of only one plant that uses auxiliary operators to meet that requirement. The only reason they do is the auxiliary operator has gone through the rad protection group for a year's time before he becomes an auxiliary operator. Other than that, there may be one or two other plants that use non-rad protection people to staff the off-shift hours. But they use shift supervisors as that individual.

MR. NEELY: Several in Region I, they train the

aux operators. Well, Indian Point 3, for instance, they put the people through like a month training program, what they call self-monitoring; and that's how they're meeting their tech specs.

MR. MIRAGLIA: How about Region V, Frank?

MR. WENSLAWSKI: I think they're more inclined to use licensed operators. I'm not aware of any AOs that are doing that function. You always, at least I do, have this uneasy feeling that the facilities take the approach: Well, a licensed operator, by virtue of what they are doing, are required to know as much as anybody qualified in radiation protection, which is generally true, except they are not functioning in that area on a day to day basis, and they just can't perform in that area as well as the person who is functioning in that area.

I always feel uneasy that they have a licensed operator, that if some kind of emergency arose he is not going to be able to do the same job as if there was a tech there who works in the area day-in and day-out. He's not going to be able to find the equipment. He's not going to be able to operate the air sampler. Although the system is set up that way, I feel uneasy about it myself.

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MR. MIRAGLIA: Is that true in Region IV?

MR. MURRAY: Region IV is about 50-50. 50 percent of the plants have HP coverage around the clock, 50 percent

it usually is an auxiliary operator.

I agree pretty much with Frank, with what he's saying.

MR. MIRAGLIA: So you are saying on the order of minimum requirement of having rad protection personnel around shift coverage? Is that minimum type requirement with the presumption that this rad protection guy is going to have an adequate training program which is audited and qualifications and all the other things that we have discussed thus far?

MR. NEELY: Right now there's no requirement to have them around the clock, okay, fully-trained rad protection staff.

MR. MIRAGLIA: How about the other aspect that seemed to be the case at TMI, is that their rad protection staff was on the order of -- I think nominally it's supposed to be 24, but they had about 21 or 22. I don't know the accuracy of those numbers, but they were split between units. Is that a common practice at multi-station facilities, and the technicians are rotated between the units on some sort of shift schedule?

MR. GREGER: You mean assigned solely to one unit as opposed to others?

MR. MIRAGLIA: A rad protection department which had X number of people, and the technicians could be in Unit 1 this week, Unit 2 the following week.

MR. GREGOR: Or on the same date, wherever their duties took them.

MR. MIRAGLIA: Yes. Is that a common practice?

MR. NEELY: We have one plant in Region I that's contrary, Millstone. They have two HP staffs, for Unit 1, Unit 2.

MR. MIRAGLIA: That's because they're two different types of facilities.

MR. NEELY: One's a PWR, one's a BWR. So there's a foreman and his staff on one unit. They have round-shift coverage on each unit.

MR. MIRAGLIA: For multi-unit stations, that's essentially duplicate plants or replicate plants, do you think that situation works better than, say, at Millstone? Millstone sort of makes sense to have that kind of thing. But there's no mandatory requirement.

MR. NEELY: Essentially, that technician, he's on duty to do some routine surveys and maybe do some chemistry, and they are not staffed to handle any maintenance activities of this type on the back shifts. So take two or three technicians for each unit, as long as they can meet all their tech specs and there aren't any problems, it's pretty hard to tell them that they should have X number for this unit and X for this unit.

MR. YANIV: Is it also a practice that they rotate

the technicians within the chemistry and health physics department?

MR. NEELY: There are some plants that do that. We try to discourage it because we found that most programs were more effective in Region I with separate chemistry department over here and for health physics, because he's not acting as a health physics technician for six months and then he's over six months later as a chemistry tech, and he can't really get involved in his work and he doesn't have the same priorities as the man that's a full-time HP tech. That's what we experienced.

MR. GREGER: There are tradeoffs. I think that's a very good observation.

I think the plants that do--unless it's a union problem, the plants that do have rotations between the HP and the chemistry groups do it primarily to provide for excess personnel for refueling outages, so that when they go down for outages it frees up their chemistry people and they can perform HP functions, and they don't have to bring in outside people to perform HP functions. That's good to a certain extent, because that allows you to use a person familiar with their plant to perform HP duties, instead of hiring someone from the outside, who may not be familiar with your plant, who may not know all the problems.

So again, I think there's a tradeoff. There's

probably good and bad to it.

MR. GIBSON: TVA has an organization which I think is maybe bad in this regard, in that chemistry does not fall under the health physics supervisor, which I'm not sure -- in fact, I know the person analyzing the sample doesn't always appreciate the significance of the sample.

MR. NEELY: They should be under the RPM. TVA facilities are not. They go up different chains to the plant manager.

MR. WENSLAWSKI: I can think of a specific instance, site kind of problems that arise by rotating people. We had a case where the utility rotated between health physics, primary chemistry and secondary chemistry. And the way the system was set up, they do six months in each area. And they had one technician -- in secondary chemistry they do environmental monitoring -- who had to read out the TLD results from environmental monitoring.

Well, the photomultiplier on the TLD wasn't working correctly and was giving false readings. But he had been trained on this instrument. But it had been over a year and a half since he had even seen it. Yet now he is in this function and he had to read it. He didn't recognize--where someone who had been working with it daily would have recognized right away, he didn't recognize it wasn't working properly.

As a result, he read and annealed all the TLDs and lost a whole quarter's worth of environmental TLD data -- a direct result of this rotating to the different functions and being rusty when you come back to one.

MR. NEELY: We have had some plants where even the consultants that are in this business of providing services in health physics have recommended that some of the utilities in Unit 1 be separate organizations under one radiation protection manager, the chemistry supervisor on one side with all his technicians and the health physics supervisor; but they all report to the one person responsible for the radiation protection program.

But I agree with Bob in this, there's some good with the other, having the people rotate once in a while or having them cross-train.

MR. WENSLAWSKI: It certainly is to the licensee's advantage, that's clear.

MR. GREGER: It may be an advantage to the HP program as a whole, again, not to have to bring somebody's who's totally unfamiliar with the plant in an outage.

MR. MIRAGLIA: Would it be fair to say that during outages, that the inspecting activity goes up?

MR. NEELY: Pardon?

MR. MIRAGLIA: The inspection activity goes up?

MR. NEELY: Yes. The module is different, for one

thing. Plus, if the licensee is going to have problems, it's going to be during that refueling or maintenance activity. That's when they start opening up systems. And you've got maybe 200 or 300 more personnel on site that are not familiar with nuclear power plants, and you have got to look a little closer at the program.

MR. MIRAGLIA: What about the rad protection people at the facility? Is their training program directed more towards the normal operation, power generation phase, or do they -- you said something that led me to believe that perhaps there is less significance rather than more being placed on times of high maintenance outage kinds of things. Is that a deficiency in training programs generally?

MR. GIBSON: I don't think you can make very many general comments about training programs for radiation protection people, because each program is a little different, and most of them aren't worth very much. That's my judgment. Maybe some other people have different opinions.

MR. GREGER: Plus the basic training you give an HP for operational type matters carries over to maintenance activities, also. It's a similar type of training and skills that are used. It's just the problems are many times greater in a refueling outage or any other type of maintenance outage.

MR. WENSLAWSKI: It's more of the planning --

MR. MIRAGLIA: I was thinking in terms of planning.

Is that before an outage, do they perhaps go back to their rad techs to get them ready?

MR. NEELY: You're talking in specific to rad techs or general employees?

MR. MIRAGLIA: Both.

MR. NEELY: Some of the plants are going to video-tape training. It costs them a lot of money to develop those tapes, but they can have an individual training coordinator push a button and have a classroom full of people. Then he can get up during intermission and answer some questions. That's the one that I was talking about, that doesn't change. That is for any employee coming on the site.

Now, to get something specific, they have to develop that for that particular refueling. If they know they have got high iodine concentrations in their primary coolant, they're going to have some problems there, then some of the plants train, because they're going to expect those problems, and they train the radiation techs to look out for those. But that's an area that is not well defined.

MR. GREGER: I can answer the question. Probably most utilities do train their HP techs specifically prior to outages, and the reason they do it is their own self-interest. If they know they're going to have problems, they want the people to be able to handle them, because if not they're going to extend their outage period considerably because of

that, and it's going to cost them bucks. So if they are a well-run organization, whether they are HP-oriented or power-oriented, they're still going to train them at that time. If they're not a well-run organization, they're not going to train them.

MR. MIRAGLIA: Is that generally true, what he just said?

MR. NEELY: I can only speak for Region I.

MR. MIRAGLIA: Well, that's what I'm trying to get, is the flavor here.

MR. NEELY: We're going through some escalated enforcement on one of the licensees where they went into an outage unprepared, with high iodine concentrations.

MR. GREGER: I'm not saying it doesn't happen. I'm saying if the management of the overall plant is not good, that may very well fall thrcugh.

MR. GIBSON: As far as I know, Region II licensees are not training technicians prior to outages. But there is some uncertainty on my knowledge. Some of that could be going on, but I'm not aware of it.

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MR. WENSLAWSKI: I would say as a general rule, it depends on what you classify, quote, as "training." As a general rule in licensees going into an outage, he's got some special difficult task or a number of them that he will give that task special consideration in planning, and radiation

protection people will be involved in that planning. Now, if you want to call that training, you can call it training. Or you can call it planning. But that does occur.

As Bob said, for his own self-interest, the guy knows that he's going to be working inside a reactor vessel, removing vibration monitors or something. He knows he has to give the job a lot of thought. And I would say as a general rule, that goes on.

I would not say as a general rule, prior to refueling, everybody sits down and reviews all procedures and all that stuff, because that doesn't happen. But if there's special work going to be going on, significant tasks, difficult work, then certainly they give it due consideration -- not as much so, again, as the Navy program does. But they may not be using -- they might use mockups or they might not use mockups.

MR. GREGER: I would say in my experience, mockups, if it's a significant job, mockups are almost always used, if they are possible to come by.

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MR. NEELY: The Region I policy is that the refueling inspection is broken down into two visits. One is prior to the refueling, a couple of weeks, three weeks. You go out and sit down with the licensee and go through his plans for the outage as far as equipment, manpower, who he's going to use to support his health physics staff, what type of work are they going to do, are they going to make steam generator

entries, remind them about certain type of surveys they have to make in there, are they going to make them. Kind of get a feeling, are they prepared to come down.

Then you come back in two or three weeks later, or a particular segment of the refueling that you want to look at. Say it's steam generator entries. That's when you actually get into your inspection.

But that's the way Region I has been handling it in the past, make a couple, two visits, and prepare the licensee.

MR. MIRAGLIA: Is that part of the inspection rules that might be followed throughout all regions?

MR. NEELY: It doesn't say that if you do that -- it doesn't say that you do that, but if you look at the module, the content is there. How you break it done is kind of a regional thing.

MR. GREGER: It's true, the module only requires the utility, some time during an outage -- as a matter of fact, in our region it's an interpretation we've made. We go every other outage rather than every outage. I think that's a regional interpretation.

MR. WENSLAWSKI: I believe so. I don't believe that's what the module says.

MR. GIBSON: I believe there is some flexibility in the module.

MR. GREGER: Do you guys go every refueling outage?

MR. GIBSON: We try to. But if we miss one every now and then, we still feel we have satisfied the program. We try to go. On a few occasions, we have gone prior to the outage. But usually we go during the outage only.

MR. GREGER: One trip?

MR. GIBSON: One week.

MR. GREGER: A whole week?

MR. GIBSON: Oh, the whole week, and I try to send more than one inspector, if I can.

MR. MIRAGLIA: Is that true in IV, too?

MR. MURRAY: Yes. In IV, I have carried it a little bit further as far as outages. I have requested the health physics supervisor to do some kind of a law study. If you have a job, before you get started on the job, that you look at it in enough detail to come up with some projected dose of what you think the job will entail.

I think this has encouraged the health physics staff to get more involved in what's going on, to where they can really try to get a figure on how much exposure would be involved in a particular maintenance activity. But as far as inspections before or after, it all depends on what's going on. If it's a rather easy outage, you may make only one trip.

Some outages, like on BWRs, when they're doing that sparger repair work, you might go there two or three times during an outage. So I interpret the module to be flexible

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enough that an inspector does whatever he thinks is necessary to accomplish a good inspection program.

MR. GIBSON: On this area of steam generatc

e-7 replacement, we put probably 20 man-weeks in on an on-site.

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MR. MIRAGLIA: With respect to the development of the inspection modules, were you fellows involved in that?

MR. GIBSON: It's been some time, but as I recall, we did have an opportunity to comment on it. We usually do.

MR. NENSLAWSKI: I think I would feel free to comment at any time on any module, if we felt there was a need to change a module, modify it or do anything, we certainly have freedom to just go in and telephone in. So, talking about it, I don't think there are any problems there.

MR. GREGER: I think modules are general enough that they allow us to do what we've always been doing.

MR. NEELY: As long as you meet those.

MR. GREGER: The reactor people felt they had a lot of problems when the modules came out, but we didn't have that kind of problem.

MR. MIRAGLIA: Are there periodic meetings during the course of the year, or schedule meetings between -- I don't know, say, section chiefs or branch chiefs at some level?

MR. GIBSON: Yes, there are counterpart meetings once a year or so.

MR. MIRAGLIA: So you get a flavor for what other folks are going relative to certain inspection models?

MR. GIBSON: I would say so, yes.

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MR. MIRAGLIA: Do you have any more on training, Ollie?

MR. LYNCH: No. Other than drills.

MR. MIRAGLIA: We can take that up under emergency, don't you think? Why don't we take a break?

(Whereupon, at 12:05 p.m., the meeting was adjourned, to resume at 1:00 p.m. this same day.)

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AFTERNOON SESSION

(1:15 p.m.)

MR. MIRAGLIA: I guess we are ready.

MR. LYNCH: The next subject I think we ought to treat is personnel dosimetry. And we may be tempted to link personnel dosimetry with personnel exposure and contamination experience, but what we have got set up for personnel dosimetry is basically the systems that the licensees use and how they use them. At TMI, I think you will recall there were a lot of problems with the personnel dosimetry during the emergency that revealed problems prior to the emergency.

I think we would like to see how the other utilities fare in the lines of personnel dosimetry, how the systems they use, the controls they had with them, the control of the dosimeters that they used themselves, et cetera. Can we have some -- what say you as far as personnel dosimetry? Frank? From region five?

MR. WENSLAWSKI: Well, I think across the board, licensees contract personnel dosimetry, they don't do it themselves.

MR. LYNCH: What kind of dosimetry?

MR. WENSLAWSKI: I think it's all TLD now.

MR. LYNCH: Extremities as well as whole body?

MR. WENSLAWSKI: Yes.

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MR. GIBSON: TVA, last time I looked into it, which was aoout a year and a half ago, was still using film an that's the only licensee I know of. They may have since —

MR. YANIV: Do they contract it, or do they do their own?

MR. GIBSON: They do their own.

MR. NEELY: Indian Point do their own.

MR. LYNCH: Contract, or their own?

MR. NEELY: Contract.

MR. YANIV: Who do they contract?

MR. NEELY: Landauer. I think Millstone is switching back, because I think they had problems.

MR. YANIV: They had their own, and they're switching back to Landauer?

MR. NEELY: No, they had Yankee Services doing theirs.

MR. LYNCH: What kind of TLD whole body badges do they have, in general?

MR. NEELY: Harshaw.

MR. LYNCH: The same kind they had at TMI?

MR. NEELY: Yes.

MR. LYNCH: Same badge?

MR. NEELY: At Millstone. It wasn't the problem with the badges themselves. It was just the program, the

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service they were getting.

MR. YANIV: What's your frequency of exchange?

MR. GREGER: Biweekly or monthly.

MR. NEELY: Depending on whether they were in an outage.

MR. YANIV: Their routine is a month?

MR. GREGER: It might be bimonthly.

MR. LYNCH: How about the weekly or monthly reporting of these? How do they use their dosimetry for personnel control, personnel exposure control?

MR. WENSLAWSKI: I think most of them use pocket dosimeters and keep the daily tab based on that. And they control the exposures based on pocket dosimeter results, rather than -- then it's just once a month they get the, quote, "legal results" back? I think as far as our licensees are concerned, and probably all licensees have administrative exposure limits that are somewhat below NRC limits, which require certain approvals in order to go above, and it would probably vary from one plant to the next. Just who that approval comes from -- and it usually goes in a higher management function -- the higher you go, the closer you get to the 3000 millirem reporter limit. The higher the level of management approval, necessarily.

MR. LYNCH: How did they contol to those limits?

MR. WENSLAWSKI: I think they would probaly vary

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from one utility to the next. I think some of them, like San Onofre, has a computer program that they are using to keep track of daily exposures. As a matter of fact, San Onofre even has their own TLD system that they use in addition to their "legal TLD" system, in addition to the pocket dosimeters, and they process these TLDs the way they would -- as if it were a legal badge.

MR. MIRAGLIA: On a weekly basis?

MR. WENSLAWSKI: It would vary, depending. If it's a hot joo, they would process them daily, just to make sure the TLDs and the pocket dosimeters are not showing too wide of a variation, and they're not going to get caught by surprise.

MR. YANIV: What ends up on form five?

MR. WENSLAWSKI: The exposure as reported by their vendor.

MR. LYNCH: Does their vendor read the TLDs at the plant, or have them sent away?

MR. WENSLAWSKI: They send them away. I think this is sometimes a problem in getting the results promptly back, although all of them usually have arrangements that if they are somewhat above limits, they would get a call on them right away. Or if they need a badge processed especially, they can usually get it done, but then it usually takes a day or two, in any event.

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I'm not sure, I have no idea what the proolems were at Three Mile Island with dosimetry, so I can't make any comparisons to what happened there.

MR. LYNCH: Al?

MR. GIBSON: Region two, with the exception of TVA, everybody uses TLD. Duke Power does their own TLD processing. Carolina Power & Light does their own. The other utilities contract it out. Eberline and Teledyne, I guess, got the business that I'm aware of. TLD badges are exchanged monthly, generally. Pocket dosimeters are used in between. Most licensees use a computer printout of some sort to keep track of quarterly dose based on the TLD and dose since the last TLD reading, based on the pocket chamber.

MR. LYNCH: How often do they update it?

MR. GIBSON: As often as shiftly, during an outage. But I don't think that's routinely the case. I guess I don't know enough to answer that generally. I know at Oconee they do it shiftly, but I suspect others don't do it that often.

MR. GREGER: Region three has a combination of film badges, all of which are read off by vendors. TLD, some of which are read off by vendors, some of which are read out in the plants. Those are the two principal -- in fact, the only means used for legal personnel monitoring.

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In addition, plants may put on their own TLDs which they read out in the plant. Or if they don't use that, they will use pencil dosimeters to read out in the plant. Readout frequencies vary depending upon the job. For the permanent records, biweekly or monthly, for the TLD readout in-plant, it can be on the job, daily, weekly, depending upon the activities going on.

MR. LYNCH: How do they control daily exposure for administrative purposes, by printout?

MR. GREGER: Pencil dosimeters, which may be a computer printout or it may not be. It may just be a hand-computed form.

MR. LYNCH: Would the individual have that, or would they have that at the HP station?

MR. GREGER: Individuals typically will not get their daily results. The HPs would normally have them. In some situations, in an outage, the doses may be tabulated at the end of a shift, and available to the supervisors at the beginning of the next shift. In fact, it may be printed up and distributed to the entire plant management on a daily basis.

Typically, the exposures, the daily exposures are not available to the individual himself. Although, in some cases they may be. They are typically there for a planning tool by the supervisory personnel. If an individual is

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approaching a predetermined flagging limit, then another notification or special notification goes out. In this case, the individual himself may very well be notified and told he is approaching a limit. It may not be NRC limit, it may be just strictly an administrative limit.

MR. YANIV: Could you address the quality control on personal dosimetry in those utilities that do it themselves?

MR. NEELY: Quality control is built into the program on a procedural basis. They define frequency when they will "spike the badges" and send them off to the vendor. And they do it, maybe, on a quarterly basis. Some do it -- more of them on a yearly basis, and then they compare them.

MR. YANIV: On the specific data, in those utilities that do their own personal dosimetry --

MR. GIBSON: In the case of Carolina Power & Light, they have two operating stations where they have a separate facility at their corporate office, where they send their TLDs for processing. And the stations do send spiked badges in. I'm not sure what the frequency is on that. The same way with Duke Power. Duke has three units at Oconee and then McGuire, which is about to start up. Plus another unit under construction. And they have built a separate training facility, and at that facility they put TLD reading

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equipment, and use it. Surry, I recall, since I spoke, does their own. They do their own on site. I don't know for sure, but I suspect that most utilities do spike badges for processing. On the area where we of course found problems at TMI, it may be a generic problem. Is quality control and loading the holders -- if the chips are not put in the holder properly, I am not sure that problem would ever be detected, which could result in underesponse to low energy gamma or beta exposure.

It is not too difficult to get that card with the chips on it in upside-down, which could cause that problem.

MR. LYNCH: In the badge?

MR. GIBSON: Yes.

MR. LYNCH: But not in the reader?

MR. GIBSON: In the badge holder. And I don't know if quality control checks that are used to identify that kind of a problem -- another quality control area where we've had problems at a couple of plants is people wearing the wrong badges, which we don't generally become aware of that, unless there is a real high exposure, that they have trouble resolving.

MR. LYNCH: You mean wrong badge or -- by wrong type, or somebody else's badge?

MR. GIBSON: Somebody else's badge. And this is an area where there are some methods that are better than

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others for preventing that.

MR. YANIV: Like a picture on the badge?

MR. GIBSON: Picture on the badge, or have an assigned person to hand out the badges to each individual, rather than a help-yourself thing.

MR. LYNCH: How about -- one of the things at TMI that was very apparent was that there was no single individual who had the responsibility of personnel dosimetry. It was a thing where any of the radiation protection staff could handle the reader, and in fact, many of them were cycled through so that each one got some experience, but there could have been a long period of time between the time they operated the unit.

Is that a prevalent technique?

MR. NEELY: No, that comes again with, I think, for the plants that Al identified, there's not that many utilities in the country that do their own badge service. Now, in region one we have one plant that has duplicate badges by different vendors. And they read the one badge on-site along with their pocket dosimeter, and that is done on a daily basis. And that's what they use as something much better than their pocket dosimeter, that they can rely on. But they still send their other badge off to the third party or the vendor for legal purposes. And then they bring those badge results and compare and they've already set

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their calibration so that they've got a fudge factor built into one, to make sure that they don't ever overexpose.

So those people do read their own badges, but those are what's called second line defense on badge.

MR. LYNCH: Anything else?

MR. GIBSON: There is a quality control check that Don has pressed for TMI that will identify a lot of proolems. And that is a routine comparison of pocket dosimeter totals to TLD results which can be done by computer. If you're putting the stuff in the computer, the computer can flag discrepancies for investigation.

Some people do that, and some don't.

MR. NEELY: Since the accident, that is one area that I&E has looked at. Three Mile Island and dosimeters. And we have found many, many problems in the dosimeter program that were there before the accident. I'm probably most aware. I know what you're talking about and in what areas. About every 30 days a new technician would run that TLD machine, and in fact, people — he'd read his own badge.

MR. LYNCH: As I recall, several people read their own badges. One of the things that popped up in our evaluation of TMI — and I just wonder — and it was alluded that it could be a problem in other areas. During the last outage, and perhaps other outages, a large number of pocket

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chambers, like on the order of 600, disappeared over the period of time.

MR. NEELY: You're talking about self-readers?

MR. LYNCH: Yes. Pocket chambers. A lot of them. And it was alluded that that is a common thing, in industry right now. Is that true?

MR. NEELY: I think it depends on -- it happens at some utilities. I wouldn't say it's a generic problem. I've been at a couple of plants where I have heard they have gone -- in one outage they went through a six-month outage, and they went through $40,000 of pocket dosimeters. It was because of their controls, again.

Now, some plants, you drop all your dosimetry and you exchange your identification badges right at the guard house when you leave. Some plants don't have a set-up like that, so a man can walk off the site with a souvenir.

MR. MURRAY: I think that was the case at TMI. They were just indiscriminately giving out pocket dosimeters and there was no record of who they were given to, or the people that received them were not given instructions to turn them in.

MR. LYNCH: That brings the question about the utility of a pocket chamber, if when they don't recover it, how are they going to get it read?

MR. NEELY: The program should be implemented such

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that if a man has a reading on -- he is issued a dosimeter and he's worked in a controlled area the day before, some of the plants in region one -- in fact, most of them -- if you don't have a reading for that day then you can't get back in there the next day, unless you have some pocket dosimeters that will show up.

MR. GREGER: Control was a little bit loose at TMI. It may still be, in that when you went into an area and you came out you recorded your own pencil dosimeter dose. It may be true of some plants in our region, but typically that's not the case. You turn in your pencil dosimeter to someone. They read it for you.

MR. YANIV: Is that something that an NRC inspector can instruct the utility on, how to do it?

MR. GREGER: You can, but there's no regulatory requirement to back you up. They don't even have to wear a pencil dosimeter, as long as they have one method of determining personal exposure. They meet the regulations.

MR. LYNCH: And they don't exceed the personal exposure limits.

MR. NEELY: That's a licensing control that they built in.

MR. GIBSON: I think the fact that dosimeters were lost does not necessarily mean that they were not properly read. They could have been read and the result recorded and

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a person just carried it home.

MR. GREGER: Actually, it got to a point after a while where you didn't want to turn a dosimeter in, because there may not be another one available when you wanted to go back in. So people were recording their doses, but were hanging on to the dosimeter. Just because they knew they'd be going back into an area and they didn't want to hassle around waiting for someone to find a dosimeter for them.

MR. LYNCH: What kind of people were these? Were they Health Physics technicians and operators or were they -- during an outage, were they Rent-a-techs?

MR. GREGER: I'm talking about TMI in particular.

MR. NEELY: You're not talking about only pocket dosimeters. TLDs, too.

MR. LYNCH: I don't doubt that, but we're trying to figure out how -- TMI, during the emergency, is a unique situation. We recognize that. Prior to the emergency there were certain aspects of the personnel dosimetry program that bear close inspection. But with the rest of the industry, we are trying to feel how they are behaving.

MR. NEELY: Let me speak to something. A lot of the plants in region one, is that a lot of them assign a dosimeter to the individual by number. And it's got labels on it for color-coding, to know that it's due for calibration -- if it's yellow, it's due --

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MR. LYNCH: Pocket chamber or TLD?

MR. NEELY: Self-readers, TLDs. Now, they control those, if a man -- and then they have those on a computer printout every day and they may also give him a small card, like a savings account, and it shows how much exposure he can have. And he takes that from control point to control point during outages, and keeps logging his dosimetry readings. Those are the plants that are probably further ahead than most of them, and that way they exercise full control, you might say. They have gone to the extreme. But most of them assign a dosimeter, a pocket dosimeter, and plant employees aren't the offender. It's usually the contractor people that come in.

MR. MURRAY: I think in most plants you're going to find if they enter a restricted area, or an area where there's a hot job going on, when they leave that area the results on their pocket dosimeter are recorded. Now, it may be in certain plants when they leave a restricted area, they leave the pocket dosimeters with a guard or with an HP tech. In that case there is not the problem of the missing dosimeters.

In other plants, they may record their results, but then they just keep the dosimeter with them. Maybe they put it in a board over by the guard gate or up where their office is, but once they have recorded that result, then

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they're free to take the dosimeter wherever they want.

But I think that there is -- that most utilities have a pretty good handle on it, once they've worked on a hot job, they come out -- that those results from the pocket dosimeter are already recorded. Now, after that time, you know, the person might just take the dosimeter with him, take it home, or whatever happens to it. But I don't think it's a case that they go in and work and leave that area, and the results are not recorded after they have worked on a job.

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MR. WENSLAWSKI: I think if that was any kind of significant problem, it would really be showing up in overexposures, that people were not recording daily dosimeter readings. I don't view that as a problem.

MR. GREGER: I think we're really overplaying it too, because they are used for planning purposes only. They're not used for compliance with the regulations.

MR. NEELY: They're estimates, and they're looked at by licensees as estimates.

MR. WENSLAWSKI: If dosimeters are missing, it's simply a case of a guy saying, "This is a neat little device."

MR. GIBSON: The University of Michigan is carrying out a TLD/QA program that some of you may know of where they are sending out exposed TLDs to a number of utilities that are participating in the program, and they are sending results back. And a lot of people are having trouble meeting the criteria that have been established.

We considered in Region II using this as an inspection technique. NBS agreed that they could expose some TLDs for us. We were going to take four or five out during a routine inspection and have a licensee read them. But when we looked a little more closely, we couldn't find out what to do with the results we got because, I guess, there are no universally accepted performance criteria or acceptance

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criteria.

MR. YANIV: There's a draft health physics standard.

MR. GIBSON: That's what the University of Michigan is using, and I guess results today show they may not be reasonable.

MR. YANIV: So there's a draft health physics standard.

MR. MURRAY: I think it all depends on what you are looking -- I think if you are looking gamma exposures, say, from 250 keV up to 50 meV, there's usually pretty good agreement on that study. But you get into the mixed gammas, low energy gammas mixed with betas, and then you throw in the complicated factor of neutrons, you know these vendors or even individual users are having a hard time complying with the established criteria.

MR. YANIV: You mentioned neutrons. I think we should discuss in a few words what they are using for neutrons basically.

MR. MURRAY: This came up a few years ago. Maybe one of the plants in my region want to identify this. But I think by and large we asked them to demonstrate that they could comply with Reg Guide 8.14 is what it amounts to. I think the plants that are using NTA film -- I know in my region -- have switched from there to TLD because of the

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problems we identified in the Reg Guides.

MR. GREGER: Again Reg Guide 8.14 isn't enforceable.

MR. MURRAY: It's not, but I think the most -- I didn't have any problems with the people in the region once they were aware of the problem. They said, "Sure. You will switch. You tell us what you want us to do." -- is usually what it boils down to.

MR. GREGER: We didn't have the same agreement on this particular point. We have people that are still using methods that don't inform the Reg Guide. We identify them to Headquarters in oral reports, and we haven't heard from them.

MR. NEELY: In Region I, we have them all turn to Reg Guide 1.4.

MR. WENSLAWSKI: I think in Region V for neutron monitoring, I think they all use TLDs or film. I think the numbers they actually used are calculated based on measurements using a rem meter and occupancy times -- is what they actually use for exposures because the dosimetry results they get back are never -- they know, in fact, that they must have gotten more exposures. They must be unreported.

MR. GIBSON: The same in Region II. The rem meter is being used, and an integrated rem meter is the ideal

solution. As long as the person carries it with him, he has an integrated dose indicated when he comes out.

MR. WENSLAWSKI: One thing to keep in mind -- that neutron exposures are not that much of a problem, and containment entries don't occur every day during operation.

MR. LYNCH: Okay. Can I just ask one question? As I can see it, many utilities use different kinds of dosimetry, different controls on day to day exposures, to control those limits. Some use cards. Some use printouts. They generally use the pocket chamber for control. That's not required.

In general, their performance is satisfactory. Is that true?

(Nodding of heads.)

And you haven't seen them. And then some of the problems that we have seen at TMI like many operators operating the equipment, reading interchangeable flip-flop badges --

MR. NEELY: The only ones that do that are the --

MR. LYNCH: Harshaw?

MR. NEELY: No, they have the -- Harshaw readers are Teledyne -- are doing on-site as preliminary indication rather than primary, and that the primary always goes off-site untouched, and that is the result. They come back -- I'll give you an example. They use the Harshaw and Eberline units. The Eberline is what they call their legal

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record unless there is a discrepancy.

MR. LYNCH: The thin one?

MR. NEELY: Yes. It's a small one. Now the Harshaw are read on-site on a daily basis. When a guy finishes a shift, he drops it in a box, and they have a 24 hour coverage of people that read them out on automatic TLD readers, and they print out a document every morning showing his exposure by that badge plus his pocket dosimeter, what he is authorized for that day, the next day, or the rest of the quarter. And it shows the cumulative of his TLD from the Eberline plus the Harshaw. And when they get -- at the end of the quarter or when they get some results back and there's a large discrepancy between the harshaw and the Eberline, then they do an evaluation to see whether they should upgrade the record they have, if it's lower, and assign him a higher dose.

MR. LYNCH: About how many people are we talking about for transactions? At TMI they reached numbers like 7000. I don't think on a routine basis, we would be talking --

MR. NEELY: Several hundred.

MR. LYNCH: A month?

MR. NEELY: During an outage. If you're talking about secondary system, it could be a couple of hundred a day because it's an outage condition. You want them read

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out -- in an operational plant, you're talking maybe 50 people or 100 people that are actually in controlled areas.

MR. LYNCH: Same with you folks?

MR. GREGER: It runs a gamut. Some small plants -- LaCrosse, Big Rock Point -- even an outage, you may be talking 100 badges tops. Dresden -- in a period where they've got two plants down, you may be talking 1000.

MR. LYNCH: A month or a day?

MR. GREGER: Well, 1000 badges, depending from when they want to read them out, they'd be reading them out typically bi-weekly. But they may have 1000 pencil dosimeters to read out.

MR. GIBSON: I have to agree with Bob -- up to 1000, maybe a little bit more.

MR. WENSLAWSKI: We don't have any operating dual units. I would say up to several hundred during an outage. Normally, there may be 100 or so.

MR. MURRAY: Yes, about the same.

MR. LYNCH: Where would we rate TMI on the bell curve as far as personnel dosimetry practices are concerned?

MR. NEELY: They are below average.

MR. LYNCH: Prior to the accident?

MR. NEELY: Looking back, they are low down.

MR. MIRAGLIA: How did TMI compare to, say,

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Oyster Creek which is GPU. Do they have similar problems there? Similar systems?

MR. NEELY: Oyster Creek shares the same computer system out of the Reading office, and it's done with the rem system. Back in October, we had some minor problems with dosimetry, but there was nothing serious. In fact, we investigated. They may have had a couple of small -- but basically their procedure is working. But they took it one step further. They used the card system I was talking about.

MR. MIRAGLIA: So they didn't have quite the same -- even though they were the same utility, they didn't have quite the same system of dosimetry control?

MR. NEELY: Their calibrations were done --

MR. MURRAY: I thought one of the problems with TMI -- when I was up there, I spent some time looking at their personnel dosimetry system. But I thought it was in the area of QC that they were only calibrating, I believe at one point, at 200 mr. The plants in my region have their own in-house personnel monitoring systems. I've seen them calibrate from about 10 mr clear up to 40, 50 r.

Also we pretty much require the plants in Region IV to participate in some off-site QC program like Battelle out of Washington. I didn't think that TMI really had a very good QC program with their in-house TLD system.

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MR. NEELY: From our review of the TMI program based on the information available, they did not do their annual calibration and quarterly calibrations on their devices. We have sent badges off to our national labs, their badges, and our results show that the dosimetry devices are, in fact, adequate. They respond.

MR. GIBSON: Did you ever send the personnel badges?

MR. NEELY: That's the ones I'm talking about. We pulled like 30 badges, sent them to Idaho and had them spiked, and the numbers aren't --

MR. LYNCH: Who read those badges?

MR. NEELY: We put them on their readers after they were all calibrated, and they were all spiked and set up at Idaho Test Laos.

MR. LYNCH: Alan, were you going to say something?

MR. GIBSON: Yes. I suspect that TMI is to the left of the hump on the curve.

MR. LYNCH: Left, meaning low?

MR. GIBSON: Low. But also I would hasten to add that I don't have a lot of confidence in my level of knowledge of the performance of other people. For example, we don't do vendor inspections, and a lot of people are relying on vendors for processing.

MR. LYNCH: Why don't we?

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MR. GIBSON: They are not a licensee of ours, and I guess we haven't come to grips with the legal issue.

MR. LYNCH: If they are really a contractor to the licensee and therefore might be covered?

MR. GIBSON: I don't know why we don't.

MR. WENSLAWSKI: There has been a lot of discussion. Along those lines, I was talking to Boo Alexander last week in Standards. He told me in a few weeks, however sooh that is, they will be issuing a notice of proposed rulemaking that will require licensees to have film badge or dosimetry services from a certified company, and then there will be a program of certification.

This study that Al was talking about with the University of Michigan is the precursor to that to find out just how good companies can perform, although it didn't turn out too well. Apparently Standards is going to proceed with the notice of proposed rulemaking to require licensees to participate with certified vendors, and that would somewhat take care of this program of inspecting vendors in that they would have to have certified programs.

Of course, that would be several years down the road before that will ever be adopted.

MR. GIBSON: The thing that makes me a little uneasy is that I believe there could be QC problems out there that we are not aware of. We become aware of problem

when a badge indicates an overexposure which can be caused by a number of factors. But when a badge reads 50 mr off from the real does, probably NRC is not aware of it. There could be a lot of that stuff out there that I don't have a lot of confidence that we know of.

Maybe other people here feel differently.

MR. NEELY: Just prior to the accident, we responded to one facility that reported a discrepancy in the dosimetry -- the pocket dosimeter versus our film badge -- and they wanted to assign the pocket dosimeter in lieu of their legal device. We had problems with that facility before, so we went up and reviewed their report and looked into their program, and in many instances in their program they had large discrepancies between pocket dosimeter readings and their film badge, and always went with the film badge whether it was low or high.

In this particular one, there was an over exposure involved, and we made a citation for an overexposure and again brought their attention that they have to evaluate when they have got large discrepancies, and they have to determine what the criteria is.

MR. YANIV: Was the discrepancy random or one direction?

MR. NEELY: Oh, no. In fact, the people that were working on this particular job that had the badges that were

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high, over a six month period, two of the individuals, it was repetitive that they had discrepancies in their pocket dosimeter versus the film badges. Whether it was the places where they wore them together, we don't know. But it showed these particular individuals -- whether it was a discipline problem, we don't know -- but it's the licensees responsibility to handle those problems.

MR. YANIV: What read higher -- the dosimeters or the --

MR. NEELY: I think the film badges were like 3600 millirem, and they wanted to assign the pocket dosimeter 1200. So we looked at RWPs and surveys that they were working with, areas that they entered, and the doses were there. They could have gotten those exposures because of the levels they were working with.

MR. GIBSON: We do have examples where the pocket dosimeter has read low. There has been a common belief that pocket dosimeters always read high, but at Surry they did quite a few tests, and we reviewed the tests and found pocket dosimeter, when it's in error, is usually on the high side but not always, which was interesting to me.

MR. NEELY: We took it one step further. We selected pocket dosimeters at random out of their issue racks, had them spiked and then read them. And we found out of, say, 10 dosimeters, we found a couple of them that

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failed the calibration, so that added.

MR. LYNCH: How often are those calibrated?

MR. NEELY: Sometimes never. There's no requirement. Sometimes it's three months. Some do it a year.

MR. MURRAY: There is a Reg Guide out — I believe it's 8.4 — that talks about every six months.

MR. WENSLAWSKI: I think there's an ANSI standard on calculating pocket dosimeters.

MR. LYNCH: Do you check against that?

MR. WENSLAWSKI: There's no clout. The best you can do is say if they're not calibrating or not calibrating by the standard, you question them, "Why aren't you, and how do you justify what you're doing?" But there is really no clout. You can't force them if they want to argue the point, and say no.

MR. MURRAY: In my region, I believe by and large they adopt the recommendations in the Reg Guide. I think at TMI they were response testing the pocket dosimeters there every six months. I remember looking at that portion of the program. They do a response test and then a drift test. I think most of the licensees in Region IV, at least every six months, they response test.

MR. GREGER: I would echo that for Region III. Maybe one a year instead of six months, but they are all

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doing testing of pencil dosimeters.

MR. LYNCH: Did anybody every check them as they come in?

MR. GREGER: Inspections?

MR. MURRAY: They have to do it --

MR. LYNCH: Check them as they are received for the first time.

MR. NEELY: Oh, they spike them before they put them in service, yes.

MR. LYNCH: I think we have covered personnel dosimetry pretty well. Does anybody have any question on that? Shlomo?

MR. YANIV: I'm just curious now the dosimeters read low? Could it oe an energy response question, low energy?

MR. GIBSON: I don't know why they read low.

MR. YANIV: I can think of a hundred reasons why a dosimeter would read high.

MR. LYNCH: I think that's a problem we're not going to solve here.

MR. WENSLAWSKI: Let me add just one more thing to this topic -- something Al said that Region II is talking about -- the possibility of exposing licensee badges and seeing how well they compare on the results. I&E has a task force now, Independent Measurements Task Force, and that is

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one of the items being considered by the task force, although we are faced with the same problem that Region II is faced with. So you do that, and then what do you take as an acceptance criteria if the results aren't in good comparison?

MR. MIRAGLIA: Just independent measurements directed at TLDs in the environment or in plant personnel?

MR. WENSLAWSKI: Personnel TLDs. It is under study right now by the task force, and I really don't know whether or not it would be adopted or not. Quite a bit depends on this performance criteria that is currently in existence in the draft ANSI standard, how that is going to change, and how this notice of proposed rulemaking is going to come down the pike and all these things.

But it's being considered again. It's been considered in the past. It's being considered again as a possible inspection activity.

MR. MURRAY: There isn't any reason why a licensee can't have just as good a personnel monitoring program as if they send them off to some off-site vendor. I really have more confidence in what the utilities in my region who have their own in-house dosimetry system. I can go in there, look at the QC program, can tell how the system's calibrated. You can work with the licensees to set up a good, sound calibration program. You know, if they just

sent them off-site to whoever it may be -- you know, they ship them off -- we have no idea what takes place at the end of the line.

Just because a licensee has their own in-house system, I don't think that it's any less -- in most cases, I would just as soon see that.

MR. LYNCH: Are these systems for in-house -- are they NBS traceable?

MR. MURRAY: The two that I have have their own in-house system. They are not NBS traceable, but they have a contract with Battelle Northwest, which was involved also with this measurement study, where they are calibrating the system in-house using their sources. They are also spiking or having -- sending off blank TLDs to Battelle. Battelle spikes them, sends it back, and they read them off. So they have a pretty good handle on the QC program.

I don't think the NBS has a program established in this area that I am aware of.

MR. LYNCH: I was thinking of calibration sources, for example.

MR. MURRAY: Oh, the sources are all traceable to NBS. There are meters calibrated by Victoreen, which is directly traceable to NBS, so in a round about way they are traceable to NBS. They are not submitting blank TLDs to NBS to be spiked and then sent back. But I really feel more

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confident if I can go in and look at a licensee's program and see how their QC program is set up. I have more confidence in those numbers, I think, than somebody just sending them off so they can get them back.

MR. LYNCH: You folks are in general agreement that you're relatively confident in the dosimetry programs within the region?

MR. GREGER: With, perhaps, the exception of extremity monitoring.

MR. NEELY: Yes, extremity monitoring.

MR. LYNCH: Tell us about extremity monitoring.

MR. LYNCH: Normally chips, TLD chips, finger rings, band-aids, et cetera.

MR. NEELY: Ankle badges?

MR. LYNCH: What kind of criteria do the various utilities use for requiring extremity monitoring?

MR. NEELY: It varies. It's dependent on the rad protection form and whoever was writing the RDP. A lot of it is not spelled out in criteria. A lot of them use the five-to-one ratio, you know, gamma to extremity, as the point where they make a decision whether they should apply extremity monitoring.

MR. GREGER: Typically, they either use a five-to-one rule or else they leave it totally up to the discretion of the rad protector, with no written rules down.

MR. LYNCH: Is that true in Region V?

MR. WENSLAWSKI: I would say more of the latter.

MR. LYNCH: Individual discretion?

MR. WENSLAWSKI: Right, of the HP people.

MR. GIBSON: It varies. I'm trying to think of the new change, Part 20, on 25 percent. Are you guys familiar with that change, that you have to have previous exposure history records if you're going to get more than 25 percent? 20.21 limit, would that apply to extremities as well?

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MR. NEELY: Through our inspection efforts we found, especially in the last two years where we've looked close at

steam generator entries, things like this, as far as extremity dosage, where the licensee in some cases haven't evaluated whether they need it or not, and as a result of our aggressive efforts they have started putting extremity badges on people going into steam generators that are coming into contact with tube sheets.

In the case of Three Mile Island, during the days of the accident, that wasn't even considered, when people were walking across floors that were highly contaminated, that people didn't even consider the dose to the lower extremities.

MR. LYNCH: This 25 percent, if you looked at a licensee giving, say, up to 3 rem per quarter, and 25 percent is what of the allowed exposure to an extremity, an extremity exposure? 18-3/4? With the whole body exposure alone, you are pretty much up to 25 percent. It doesn't take much more.

MR. NEELY: It all depends on how large the source is.

MR. LYNCH: Oh, yes.

MR. NEELY: That's a consideration. That's a judgment factor. And maybe it's a beta dose. You never get a whole body dose compared to extremity.

MR. GREGER: Not many people go up to the limit of the whole body, so it isn't very frequent that you can say, because of whole body exposures you're automatically up to 25 percent of extremities.

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MR. LYNCH: I didn't say that. But I agree with you, you wouldn't. But if you were allowing people up to almost a quarterly limit, if they are in contact with a source in any way or close proximity with the hands, just a factor of two is enough --

MR. NEELY: They could have a shield in front of them, too.

MR. MIRAGLIA: Would it be fair to say that, basically, in the routine operations, that there is infrequent use of extremity monitoring in the day-to-day operations? Extremity monitoring is more associated with significant maintenance or outage periods?

MR. NEELY: Yes.

MR. MURRAY: Yes.

MR. GREGER: Definitely. There probably is no routine extremity monitoring.

MR. MIRAGLIA: So it's conceivable there's little experience out in some of these -- like say at TMI, were there any occasions for them previously to have extremity monitoring?

MR. NEELY: They were citing it for refueling it before.

MR. GIBSON: But they didn't have extremity devices available, did they? They didn't have finger rings or anything like that?

like that?

MR. NEELY: The citation says it's fair to make surveys to determine --

MR. GIBSON: When the accident occurred, I don't think they had the devices available.

MR. MIRAGLIA: That's what I was thinking of, a period -- like during the course of reading the interviews, some of them didn't even know what you were talking about.

MR. GREGER: That's an exception. I don't think that's typical of plants. I think the majority of my plants have extremity devices available and have used them on occasion.

MR. NEELY: The other thing with extremity monitoring, when you talk about reading dosimetry on site, extremities, except for the ankle badges and finger badges, are all sent off site. And the reason is they don't have capabilities to read them on site, such as Three Mile Island. The turn-around time is --

MR. LYNCH: Okay. Let's shift to personnel exposure and contamination experience, as opposed to dosimetry. Try contamination experience as a start.

What kind of experiences do the utilities in your regions have in the way of contamination? For example, how often do they have it? What is the nature of the contamination? How do they handle decontamination? Do they have medical

personnel available, either on call or on the spot, when they are handling severe cases, et cetera?

Can you give us any feelings on this?

MR. GIBSON: Are you talking about contamination on people?

MR. LYNCH: Personnel contamination.

MR. NEELY: External?

MR. LYNCH: Yes.

MR. GIBSON: I think at most facilities, during outages, personnel contamination is fairly common. I would say that during on outage skin contamination is probably found a few times per day at most facilities. It is not anywhere near the magnitude of the amount of contamination that was found at TMI.

We're talking generally something that is just a few thousand DPM, something that would not register, a tenth of a millirem per hour, for example. And at TMI we were reading over 100 millirem per hour in some cases.

MR. LYNCH: What was the nature of the contamination out at TMI?

MR. GIBSON: I would say small areas on the skin, people removing contaminated clothing, brushing it against their arms or legs or forehead or something like that. Personal clothing is contaminated. Shoes are contaminated quite often.

MR. LYNCH: What's the nature of the radionuclides?

MR. GIBSON: Activation products: cobalt, iron, manganese, all those things that are in reactor coolant.

MR. LYNCH: Easily removable?

MR. GIBSON: Soap and water takes it off, I would say, 90 percent of the time. There are occasions in Region II where people have been sent home with measurable contamination on them, because it could not be washed off. I can think of a few cases.

Like, for example, once a guy put his hand down in the refueling pool for some reason, and they couldn't clean it up. There have been other cases where contamination couldn't be removed.

I would say, not being accustomed to high levels of contamination, most utilities are ill-equipped to rapidly assess dose commitment for skin contamination. I don't think that's something unique to TMI, although TMI did such a miserable job that they may be worse off than most. But most utilities I don't think have pre-established methods of assessing dose from skin contamination.

MR. LYNCH: Do they rely on outside consultants?

MR. GIBSON: When I think back in Region II experience, I don't remember a case where an outside consultant was called in right off-hand. I do remember a case where Surry did not evaluate it and we cited them for not evaluating

a skin exposure case. And I think it's because it never occurred to them that the man might have received a significant skin dose.

I think that skin contamination is not used as often as it should be used as an indicator of the adequacy of the contamination control program. I think records should be maintained of each skin contamination case, and some amount of evaluation should be done to find out how the person became contaminated, and some corrective action taken; that the record should be reviewed periodically by an HP supervisor, so he knows how well the contamination control program is working.

MR. LYNCH: You mean like a critique after a contamination incident?

MR. GIBSON: What I'm really thinking is like a management information system, to say you had 14 cases of skin contamination last week.

I think also the critique would be useful in finding out how the man became contaminated and taking corrective action.

MR. LYNCH: Do you see con-con bags used in industry?

MR. GIBSON: No, they're not used. Maybe some rare exceptions. There are some exceptions. I know of some exceptions. They're used in the Navy, and that's where people

get the idea.

During the Surry steam generator outage, Surry built what is likened to a sail loft at a nuclear shipyard. As a matter of fact, they brought in herculite and plastic heat-sealing machines, and they manufactured glove bags and tents and all of this stuff. And they did not have much success with it.

They found that the work was slowed down to the extent that people were picking up higher radiation exposures. They weren't used to working in these things. And as the outage progressed, they began to do away with them.

I think it was the right decision at Surry, because the containment was already so contaminated that it was just as contaminated outside the bag as it was inside in some cases.

So they don't even use drapes in all cases under -- they do in some cases.

MR. YANIV: Is it correct that they do not go beyond soap and water in cases --

MR. GIBSON: I don't want to say that generally. Soap and water usually takes it off. They may have other cleaners available, but I don't know. Maybe some other people here know.

MR. MURRAY: There is all kinds of off the shelf decontamination, decontaminating lotions or soap that can be

purchased.

MR. GIBSON: But I don't know if they are being purchased or not.

MR. MURRAY: In Region IV, I would say most all of them have some type of decontamination soap that was purchased specifically for that, with that in mind.

MR. NEELY: I think the radiological health handbook outlines steps and different types of methods they can apply. I would hope that most of the health physicists in the country would know that information is available.

MR. GREGER: I don't see this as a big problem in Region III. For one, everybody typically preplans for personnel contamination incidents, because it does occur quite frequently. It is stressed in the emergency planning inspections, because of major incidents. They do have enoug experience with routine personal contaminations that they know how to handle them.

Now, they don't typically get involved in massive personal contamination problems, and it is quite atypical that they would have to go beyond soap and water, although on occasion, once a year, once every couple of years, a typical plant may have a situation where they either have to send a guy home with some contamination and let the skin slough off or they may have to apply a solution to try to remove some of the dead skin themselves.

Rarely have I -- in fact, I don't know that I've ever run into a situation where a medical -- medical assistance has been brought in.

MR. LYNCH: Why would that be? Because it just doesn't happen or that nobody thought about it?

MR. GREGER: Because there doesn't appear to be a need for it. I'll take that back. There was one case that I do recall. An individual had a contaminated particle in his eye.

If it's a situation where they believe they need medical expertise, I think that typically medical expertise is sought out. And this again, I would go back and say, is because of the preplanning with respect to personnel contamination, because of emergency planning requirements.

MR. LYNCH: Maybe this is too much detail, but would you have any idea whether or not that medical personnel or those medical personnel had any experience in radiological procedures?

MR. GREGER: Typically, if they are going to bring an individual with any amount of contamination to a medical institution, they're going to bring it to the medical institution that they have made arrangements with for their emergency plan. And I'm not sure this is the case, but if I were them I would bring them to the doctor that I had made arrangements with and had discussed basic radiation protection.

You obviously don't want to bring him to a medical individual who is going to overreact totally to the radiation aspects and not take care of the medical problem of the individual.

MR. LYNCH: Do you ever check to see what the backgrounds of these medical people are that have been assigned this problem?

MR. GREGER: I may beg off. I think the answer is yes. I haven't looked at an emergency planning module for quite some time. But when I did, we did look and talked to physicians who were designated for emergency planning, and talked to them about their experience, their knowledge and training in rad protection, yes.

MR. LYNCH: Is that true around the table?

MR. NEELY: I can't speak to that, since our region is set up differently than the other regions. In Region II, your section covers the emergency planning.

MR. MURRAY: In the area of emergency planning, there is a statement in there that usually in their emergency plan, that the physician, the off-site physician, has to receive training. There used to be -- I guess it's still in effect -- a course at Oak Ridge. It was either a one or a two-week course, and what would happen is that the utility would pay the local physician's expenses to go down to Oak Ridge and go through this one or two-week course.

I know in Region IV all the physicians at the off-site hospitals have gone through this course, and that's one of the items they touch on in the course, is skin decontamination.

But I believe when the emergency plan goes through NRR for review, that they insist that that statement is in there, that the physician has to receive a certain amount of training.

MR. LYNCH: Okay. How about personnel exposure?

MR. MIRGAGLIA: Before we leave contamination exposure, Al, what you said leads me to believe there is no requirements that they maintain records of personnel contamination unless they exceed --

MR. GIBSON: Part 20 requires records of exposure to radioactive material, I believe is the way it's worded. Is that right, Don?

MR. NEELY: That's the way we enforce it.

MR. GIBSON: I'm not sure -- I know for several years -- in fact, I don't know that Region II has ever enforced that. We may be inconsistent in that.

MR. GREGER: For contamination? 1913 284

MR. GIBSON: For contamination. But I think Region I has enforced it. But I have talked to our licensees and encouraged them to keep records, and as far as I know they are all documenting it to some extent now. But I'm not --

I don't think we have enforced it as Region I has.

MR. MIRAGLIA: I was trying to determine whether there was some sort of trip point, perhaps, where they would maintain records, but not necessarily notify NRC.

MR. NEELY: There's no notification on it.

MR. MIRAGLIA: It's not like an overexposure, when you get here you document, and you can do it as long as you want; but if you come to this point, you have to notify NRC. It's not that the analogue doesn't exist?

MR. GIBSON: We wanted it documented for two reasons: One is to provide licensee management with the feedback; the other thing was to give us an auditable record, so we'd know how good they were doing. And for the second reason, they didn't want to keep the records.

MR. NEELY: The other thing is, when they have identified a man who has received contamination, the next question we have: What did he go home with? Was it nondetectible when you released him? So we said, show us your evaluation of it or, if there was contamination, what dose did he receive during that period he had the contamination?

So in Region I that document supports their evaluation. Any more, the licensees in Region I, most of them are putting it into procedure. They actually have a diagram of an individual and they mark location of contamination, and then they track him as they decon him or whatever.

MR. LYNCH: How consistent or timely are these reports made of individual contaminations?

MR. NEELY: Usually they are right away if they're of any significance. Sometimes -- it all depends on their work. For refueling, it might take weeks. In the case of Three Mile Island, some of these smaller amounts of contamination that have happened in the last month, we still haven't received the reports from the licensee, mainly because they have got their attention directed to things more severe at the time, and they are limited on manpower.

MR. MIRAGLIA: Has I&E received contamination, personnel contamination reports, say, on the individuals that took a primary sample?

MR. NEELY: Those reports came in as overexposures to NRC regulations, and we have received those reports.

MR. LYNCH: Do they treat contamination separately?

MR. NEELY: No.

MR. LYNCH: Did they treat it at all?

MR. NEELY: They treated it as a skin dose. And I think there was three individuals they finally ended up with.

MR. YANIV: Let's talk about internal contamination.

MR. MURRAY: I can discuss what setup they have in Region IV. Usually, it is determined through whole body counting. Each of the reactors have their own whole body counting systems, and depending on the work characteristics

of the individual involved, they are whole body counted at various frequencies.

Normally, everyone in the plant is whole body counted annually; other people that visit controlled areas more frequently, such as operations, health physics, maintenance, are whole body counted semi-annually, or quarterly, or typically, at the end of an outage.

Whole body counting is also supplemented with a bioassay. This is, you know, like at Fort St. Vrain, where they have a tritium problem there, they rely more heavily on bioassays than whole body countings. But I think the basic tool is whole body counting, and this is supplemented by urine analyses and bioassays.

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MR. MURRAY: Like I said, in Region 4, each licensee have their own whole body counting system. So they don't have to wait for Helgeson to bring their truck in once a year or every six months.

MR. GIBSON: In Region 2, they all have their own body counters. Nobody is using bioassay now. Surry used it, but they dropped it.

Also, I think it is generally true at power reactors that respirators are put on at such low air concentration that there is little need to keep track of MPC hours.

MR. LYNCH: How do they non-bioassay for tritium? Or do they have a problem with it?

MR. GIBSON: There's just not enough airborne tritium to be a problem.

Airborne tritium doesn't reach MPC concentrations, period. I don't know of a case where it ever has. I remember at Oconee where they lost a reactor coolant pump seal at 100 percent power and filled the containment up with steam. They were below MPC on tritium.

MR. NEELY: I think over the last several years, most of the facilities in Region I have gone to whole body counting for individuals for their first visit on-site mainly during refuelings as a baseline because they don't want to take credit if a guy got something at another utility. And this is their baseline. Then they count them when they leave, or

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as needed during the outtage. And for the plants that have respiratory protection programs that they're taking protection factors for, they do that to support their respiratory protection program.

MR. LYNCH: Bob?

MR. GREGER: I was trying to think -- I don't believe that there are any facilities left in Region 3 that don't have their own installed whole body counter. There may be one or two at the very, very most. Sometimes they may share a whole body counter with another facility in the region. Kewanee Point Beach, a whole body count. There's Big Rock Point. Palisades, I believe, share whole body counters. But they have them available, so if they have an incident, they can count someone right away without having to fight for Helgeson, come around three weeks later to count.

Whole body counting, typically in Region 3 is used certainly primarily to determine any internal exposures. Rarely, bioassays are used.

Routinely and less rarely if there is a suspected uptake. But in either case, it is a secondary method of determining internal exposures to whole body counting.

I would echo Al's comments with respect to actual exposures to airborne concentrations and radioactive material. I think any time we see high whole body count results, we can almost in every single case track it back to an incident where the

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individual either ingested some material or had a problem with wearing a mask and it didn't fit him, or he wasn't wearing a mask when he should have been wearing mask.

And an incident occurred that he didn't have a mask on.

But if an individual is wearing a respirator and the respirator fits reasonably well, he will never run into a problem with an internal exposure.

MR. YANIV: How good are the quality control with regard to identification of radionuclides, determination and conversion to a dose?

MR. GREGER: Essentially, they all use -- one exception. In my region, they all use a contractor to do that work for them, either a contractor to do it for them on each individual whole body count, or else one who has set up a program for them.

MR. HELGESON: Dan has transferred out to the west coast and he does the analysis in most cases.

RMC has a computer program which they set up, which RMC sets up and then the site itself can just plug in --

MR. WENSLAWSKI: I don't believe that any of this is transferred to dose, as you say. There's no reason to do that.

MR. YANIV: Why not?

MR. GREGER: There are no regulations -- I guess that is true, that regulations don't require that you include

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internal dose to external dose at this time.

In fact, the way the regulations are written, they are written in terms of exposure to airborne concentrations rather than any internal dosage.

MR. GIBSON: We have --

MR. LYNCH: That does produce the same --

MR. GIBSON: Someone could take the numbers and run a dose out, but the licensee doesn't do it.

MR. LYNCH: MPC gives you what? 5 rem?

MR. GREGER: No. Only if you have been exposed to the point where you are in equilibrium of an MPC over-exposure of a short half-life materials compared to a long half-life material leaking to a totally different internal dose.

MR. GIBSON: We have a phantom that was made by Idaho Falls that we carried around to all of our licensees which contained cobalt and cesium, as I recall, and what it is is a stack of three-quarter inch plywood sheets about so thick with planchet sources planted in the center sheet and we could unbolt it and switch the sources around. And we got pretty close agreement on that.

MR. NEELY: The whole body counter-inspection effort is also like the TLD with the vendors. If they are not licensees, we can't get at them unless they are on-site.

And we found problems with the people when they had the units on-site.

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MR. GIBSON: We did check Helgeson out with our phanton at TMI. We took the phantom to 8 power reactors, 2 national labs, and then we got whoever was up there at TMI.

MR. LYNCH: How did they come out?

MR. GIBSON: They all came out pretty close. I don't remember the percentage, but it was close enough.

MR. LYNCH: How did they handle internal exposure from non-innaled doses if they ingest it?

MR. GIBSON: Well, some licensees are using the counter that scans the whole body. But I would say at least as many are using a chair model which has a detector -- I don't believe it has a GI detector, one on the chest and one on the thyroid, typically.

MR. LYNCH: They're looking predominantly at inhaled.

MR. GREGOR: In our region, almost everybody has a whole body counter that looks at the entire body. I have only one licensee with a chair-type. They treat ingestion the same way they treat inhalation regulations today. They don't distinguish between the two.

If you ingest it, you can't ingest more than you're allowed by the regulations to inhale.

You had asked a question earlier and this brings up a good point. If there are any regulations or rules that we would

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impose upon licensees, that may not be extremely meaningful. And this is certainly one of them and the case is brought to point by your earlier question.

If an individual is exposed to 520 MPC hours of iodine 121, the dose that is received to an organ is significantly different than if an individual is exposed to 500 MPC hours of cobalt 60 because cobalt 60 MPC is based upon exposure for 50 years and it will take many years to get to equilibrium; whereas, in iodine, you're in equilibrium. Essentially, right away, you're very sick.

And so the actual -- the way the regulation is written, the actual dose is of secondary importance when, in fact, that is of primary importance.

So we are in a position of enforcing a regulation which does not place the importance upon the actual physical harm to the individual.

Many licensees will counter when we come by and say, you have exceeded, let's say, not the 520 MPC hours because that's rarely, if ever, exceeded, but the 40 MPC hour control measure for cobalt 60 and they'll calculate dose and they'll say, that's 5 millirem whole body dose, and you are getting all excited about it.

And our only retort is, unfortunately, yes, that's the way the regulations are written.

MR. YANIV: It will take a while, but the regulations

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are about to be changed.

MR. GREGER: They should be.

MR. GIBSON: When?

MR. YANIV: There will soon be a note in the Federal Register with their intent to redo Part 20.

MR. LYNCH: Any other questions on internal exposure? Let's go off the record.

(Recess.)

MR. LYNCH: Continuing on with personnel exposure. By region, what kind of personnel exposures have you experienced from the various utilities?

By that I mean what kind of exposures to the various utilities do the various utilities experience routinely and say, during outtages?

MR. NEELY: Exposures to whole body?

MR. LYNCH: Whole body.

MR. NEELY: In excess of limits?

MR. LYNCH: In general, if you can say that excessive limits.

MR. NEELY: We have had some cases over the last few years. In Region 1, we have had some whole body doses in excess of quarterly limits. 1976, Indian Point, where the individual went underneath the vessel and received a 10 rem exposure.

We have had a few incidents where they just went over 3 rem

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on some occasions in different power plants.

MR. LYNCH: What are the causes of these?

MR. NEELY: Usually, it's maybe sometimes the man had -- you know, he had one (inaudible) process and that record wasn't included into the system, a string of problems, some cases where they made some entries into the reactor buildings during refuellings and badge results come back over 3000.

Sometimes they couldn't explain them.

MR. LYNCH: Or the pocket chambers didn't control them.

MR. NEELY: One was -- one badge came back reading 22 rem and the pocket dosimeter, I think, showed 200 or 300. And they tried to claim that it was contamination on the badge.

But again, here is another individual has excess to extremely high radiation levels and they were cited for the overexposure because they couldn't prove that he didn't get it.

I would say the number of them is anywhere from maybe 5 to 10 over the last three, four years whole body.

MR. LYNCH: Are they increasing or decreasing?

MR. NEELY: They are decreasing. The utilities in Region I are very conscious. The ones that do happen are unfortunate. But usually, it's a one-shot thing. It wasn't

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a breakdown in the controls. I think the utilities are getting a better handle on it. They are also exercising better controls by cutting them off at, say, 2200 or 2000 millirems.

Most utilities have that control. A lot of them read badges at specific levels and they restrict the people for entry until they read their badges out.

So they are getting a better control this way. It delays their work, but I think it's improving.

MR. LYNCH: Blaine?

MR. MURRAY: There has never been an overexposure in Region 4 in a reactor facility. I think as far as routine maintenance, they keep a pretty good handle on what's going on and usually, their administrative limits are quite a bit below the NRC limits.

So, you know, when they get around 20 to 100 to 2500 millirem, they usually pull somebody out. Their in-plant administrative limits usually restrict them to about 2500 millirem.

I think most generally, most of the overexposures occur, you know, associated with some accident or somebody doing something that they weren't supposed to be involved with.

We just haven't had that problem in Region 4 yet.

I think as far as routine outtages, you know, there just hasn't been any problem so far. You might say that at

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Ft. St. Vrain, I believe, there the maximum exposure that has ever occurred has been something like 120 millirem per year.

I would say 95 percent of the TLDs read less than the minimal detectable level.

MR. GIBSON: That says something.

MR. MURRAY: For gas reactors.

MR. GIBSON: It sure does.

MR. MURRAY: But they do their surveys with them with a micro arm meter. BVut I think they had one person who had 120 millirem and the next one was like 80. And then the third highest was like 50.

MR. LYNCH: Bob?

MR. GREGER: There have been very few overexposures in Region 3 in the last several years. The ones that have occurred have occurred for two reasons: Either the daily accumulated exposures of individuals have shown that an individual had, say, a couple of hundred millirem to go. They put him into a job expecting to expose him maybe only to 100 millirem and he came out, for some unknown reason, whether actual or an instrument problem, slightly over the limit.

So the exposures nets case would be just slightly over 3 rem.

The other causes of overexposures have been people going underneath the core in PWRs with the in-core thimbles removed which has occurred at least two times, if not three times, in

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the last few years. And those exposures can range from slight overexposures to massive overexposures purely by luck, depending upon how long the guy is in there.

MR. MIRAGLIA: Is this directly attributable to the amount of in-service inspection required?

MR. GREGER: This is an accident situation. The guy goes in without realizing what the radiation fields are.

So those are really the two situations we get overexposures, either slightly over because of some problem in keeping track or an accident situation puts him over quite a bit.

Typically, the exposures have been diminishing, I would say, within our plants. It is rare that an individual gets over 5 rem a year. Most plants try to keep a 5 rem a year limit on individuals even though they don't have to, although in a typical plant, you may find out of several hundred individuals over the year, maybe only 5 or 10 may exceed 2 or 3 rem in a year.

Typically, exposures are fairly low.

MR. LYNCH: Al?

MR. GIBSON: In Region 2, we have had just a few cases where an individual would receive more than 3 rem. Probably since our first reactor started in 1972, I would say maybe four cases of exposure between 3 and 4 rem at reactors.

And just recently, we had a 10 rem exposure at Surry, where

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the shift supervisor, operations shift supervisor entered the area under the core with the thimble withdrawn and this was an example where it was strictly the individual's fault. He entered without an RWP, without reviewing survey results, ignoring postings, posted levels. He asked a friend what was the radiation level and the friend quoted him the levels for the other unit, which was shut down.

Well, we did have a case where a guy lied about his age. He was 17 years old, said he was 18, and got more than 500 millirem.

We had a case where a badge came back reading a little over 3 rem. And the company believed that the individual deliberately exposed his badge when he was not wearing it, but couldn't prove it. So they assigned him dose.

Overexposures are pretty rare, I guess is what we're saying

MR. LYNCH: Are they going down, rate-wise?

MR. GIBSON: They have never really been very high in our region. I would say it's rare that anyone gets over 5 rem a year. It's not so rare that people get up to 3 rem a quarter. They get between 25 and 3,000 millirem a quarter during an outtage.

MR. LYNCH: Frank?

MR. WENSLAWSKI: I'm surprised to hear that overexposures are so rare.

MR. GIBSON: We have a pretty tight program.

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(Laughter.)

MR. WENSLAWSKI: We've had a few overexposures in Region 5. I wouldn't say a lot. There's the Trojan is the most famous one. I don't think that I have to go into that. You probably heard about that. We had a couple recently -- recently being within the last couple of years at Rancho Seco. One of them was a case where, when we were talking earlier about dosimeters, there was a clerical error and some 700 millirem where the pocket dosimetry exposure was not entered into the guy's weekly log of exposure.

As a result, they allowed him to continue on up in his exposure.

As a result of that, he went over the quarterly limit. Later on, they found that they had misplaced his dosimeter card.

They had another one where it was a welder cutting out a filter. He was working behind a specially built lead shield and when he cut through the first pipe, the filter kind of fell over, which forced him, in order to make his second cut, to come to lean around the lead shield more in order to reach the cut. And he was working in about 15R field.

So he got overexposed.

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MR. WENSLAWSKI: That's about it as far as recent overexposure goes. If you go back further in history, my recollection is not that -- well, although we've had some, I believe. San Onofre had some years back that Harry could probably fill me in on, and probably Humboldt going back to the early days of operation of these two older plants.

As far as normal exposures go, I don't think it's too uncommon for our licensees to push the limit of 3 rem. They usually have tight administrative control, so when they get up around 2000, they are keeping real close tabs. And when they get to maybe 2600 or 2700, they'll call it quits, just in case there is a difference in pocket dosimeter to TLD result.

But this, again, mostly occurs during an outtage. I think man-rem wise compared to some man-rems I've seen, where some of the steam generator work has been going on, it had been pretty low, generally less than 100 man-rem a year as compared to some of them, you see. Except for, we've had some high man-rem exposures at Humboldt where they had been doing some work.

This is a few years back. They haven't done anything up there in the last year or two since they're not operating. They had some high man-rem exposures when they were working in the reactor vessel.

Other than that, we haven't seen any. That's 1500 man-rem

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exposures or anything like that, where there's real high level steam generator work going on.

MR. LYNCH: On these overexposures, do you normally find that their reporting is timely?

MR. WENSLAWSKI: Yes. We cited Trojan. One of the items of non-compliance there was that they did not immediately report it. And one of the exposures was in excess of 25 rem. Regulations require immediate reporting.

I forget now long it was, 10 hours or something, before we found out about it. But they did not believe it was a 25-rem exposure. That's why they did not report it immediately.

It was 25 rem exposures that we cited them and they didn't argue. Now they report when they're required to. We have good -- on anything, on that with all our licensees, if it's a 30-day report, we'll get a call on it the next day and they'll let us know what's happened, what's going on, and tell us a report is coming in.

That's standard operating procedure, almost no matter what it is, radiation protection or anything.

MR. NEELY: I can't recall a time when they haven't in our region.

MR. WENSLAWSKI: I was going to say I imagine that it's that way in all the regions. They don't try to keep anything back.

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MR. GIBSON: It's that way with reactors. NFS is anotner story. They wait until the last minute to tell us about it. But I do think it may be an example where the regulation has not kept pace with our desire to know information. We obviously all want to know immediately if 3 rem is received. And yet, they are not required by the regulation to tell us until 30 days later.

MR. NEELY: A lot of them in Region 1, just for information purposes, will notify the resident inspector, or make a call to us and give us preliminary information that we've got an occasion, that we've got a badge in excess of 3 rem.

We've got those instances.

MR. GIBSON: We get those, too. I don't have a problem in performance. But it's not required. It's voluntary.

MR. NEELY: That's right.

MR. GIBSON: Except for NFS.

MR. LYNCH: Any other questions?

MR. MIRAGLIA: You would say generally, then, Don, for your region, even for TMI prior to the accident, that this long period of overexposure reports coming in on a timely basis?

MR. NEELY: Yes, except for Three Mile Island because of the --

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MR. MIRAGLIA: Subsequent to the incident, yes.

MR. NEELY: To my knowledge, I can't recall any that we have had to give a citation for or call them up and say, hey, where's the report for whole body exposure in excess of 3 rem.

MR. GIBSON: We did give Vepco a citation for a delayed report on that 10 rem overexposure. I don't remember if that was a written report or verbal. I believe it was a written report that came in after 30 days.

MR. NEELY: I'm talking about 30-day reports. I'm not talking about 24 hour.

MR. GIBSON: I guess the 10 rem would have been a 24-hour report. That's probably what they were laid on.

MR. NEELY: Yes.

MR. MIRAGLIA: I guess we go to the next topic, which is instrumentation, both portable and fixed instrumentation.

I guess one area that we can look at is the portable instrumentation. I guess you are all aware of the experience at TMI, is that during the course of the incident, they didn't have many instruments available for use in response to the incident, primarily because they were just coming out of an outtage.

As NUREG 0600 points out -- I don't know if NUREG 0600 points out, but Al Gibson pointed out in his briefing to us,

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I guess, that there are no requirements for minimum number of instruments.

What would be a normal complement, no specific guidance for different types of instrumentation?

MR. GIBSON: The FSAR does contain some commitments on that. But in the case of TMI, the commitments were so general that they were of little use. At other facilities that I'm familiar with, commitment is for -- if all they did was meet the commitment, they would not have enough instrumentation.

MR. NEELY: The instrumentation, I believe, because it's not written down, that you have to have 15 iron chambers, is really an inspector's judgment. If that facility is adequately supplied with radiation monitors for instrumentation, that goes for air samples as well as --

MR. MIRAGLIA: Let me just ask the question basically with respect to your experience in Region 1. Has the type and number of serviceable, portable instrumentation been a problem in Region 1, generally?

MR. NEELY: Normally, in most of the plants in Region 1, they have sufficient instrumentation in the plants and they maintain it in a manner that it's usable.

That way, one of the plants we went through last October that had a similar situation as Three Mile Island -- that was Oyster Creek. Their instrumentation in the notice of violations

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letter that was transmitted, the notice of violations requested that they improve their maintenance and calibration of radiation monitoring instruments.

MR. MIRAGLIA: This is GPU again, so it's the same kind of problem of maintaining calibration and getting timely maintenance.

MR. NEELY: Instruments we went in about a 6-month period. We made two or three inspections and it's documented in inspection reports, our concerns with their radiation monitoring instrumentation not working. Equipment that was out of service.

But overall, in Region 1, for what we can enforce, it's in good --

MR. MIRAGLIA: How about types of instrumentation? Are the utilities generally, say, in Region 1? Do they have a suitable number of beta gamma neutron?

MR. NEELY: Yes. When they don't have it, they have to restrict their activities, and when that happens, the management makes a decision to order some more instrumentation because it's got work stoppage.

But I think they could have more, but we don't have the tools to say, you have got to have it, unless it's an emergency problem.

I don't think a lot of utilities have the back-up instrumentation for another emergency.

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MR. LYNCH: Have you ever run into a case where waivers have been granted for entries into radiation areas because they didn't have the proper instruments?

MR. NEELY: High radiation areas?

MR. LYNCH: Just say radiation areas.

MR. NEELY: Not to my knowledge. There is no requirement as long as the area has been surveyed. But now if it's a high radiation area and there's a requirement that they carry a dose-rating hand device, there is no waiver unless they provide health physics escort or continuous coverage, or something like that.

MR. LYNCH: I'm not saying a waiver from the NRC.

MR. NEELY: I don't know of any. But if I were aware of it, it would be a sizable situation, most likely.

MR. GREGER: This is probably the one area that was have talked about so far, but I would feel the least comfortable in in saying that my region would not suffer the same problem in the case of an accident like TMI suffered because I know in many instances --

MR. MIRAGLIA: What I was trying to do, Bob, was to distinguish between the accident situation and the normal kind, based on my understanding of what was seen in Three Mile Island was that there appeared, when you look at what's been done, the inspection reports, I&E's report, our efforts going back through the records, there appeared to be a

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continuing history of untimely maintenance, lots of instruments out of repair for long periods of time with apparently management, or at least some level of management's awareness.

Yet, it was a continuing kind of problem.

So while it existed during the accident and perhaps limited their response, it was there before.

So I guess my questions are: Is that kind of thing having the suitable type of instrumentation, getting timely repair and maintenance, keeping them in calibration, that kind of chronic kind of problem that appear to be in existence at TMI prior to the accident kind of a typical kind of pattern that you would see in the utility say in Region 3?

That's part 1.

Then the accident thing is another situation. I was just trying to focus on that general problem.

MR. GREGER: I was going to base my statments on my observations on a number of occasions that plants in my region have had problems with -- now I hate to say adequate numbers of survey meters because there is no real definition of what's adequate.

They had enough survey instruments at the time to conduct whatever operations had to be conducted or else they didn't conduct them.

There was a situation at one plant where they did not have

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a neutron survey meter on-site that was calibrated. A containment entry was called for by procedure. The containment entry required a neutron survey. They didn't make the containment entry in this situation.

It involved a lot more than just that because there were people on one side saying, make it, and people on the other side saying, don't make it.

But the bottom line was that they didn't make the entry because of the problem with lack of survey instruments.

I think of the problem with turn-over time, turn-around time with survey instruments for calibration in my region is uniformly poor. It takes a long time and much longer than anticipated by licensees in many cases to get survey instruments back out and back in, either for repair or calibration.

I would assume that would be a problem that's typical every place because it's the vendors that are holding up the turn-around.

MR. LYNCH: They send them out?

MR. GREGER: In many cases, they send instruments off for calibration, yes.

MR. GIBSON: Most of our licensees do their own.

MR. NEELY: So do ours.

MR. WENSLAWSKI: I think ours do as well.

MR. MIRAGLIA: How about maintenance? On-site as well?

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MR. GIBSON: Yes.

MR. MIRAGLIA: Is the experience in 2 similar to what Bob was saying, or would it be different?

MR. GIBSON: I'm not aware of a problem in 2. I'm not saying that it doesn't exist, but I don't think it exists.

A related problem that we have had is we have noted at two different reactors who are doing their own calibration higher radiation exposures for the technician assigned to do the calibrations.

In one case, the guy received 4 rem last year and he didn't do a single thing except calibrate instruments. In looking into it, he was standing in the field holding the instrument, an HP technician, and that's an interesting problem.

There's a new ANSI standard on calibration of instruments which addresses that.

MR. LYNCH: No remote-handled equipment, then?

MR. GIBSON: Right. But I'm not aware of a problem.

MR. MIRAGLIA: How about in 3 -- in 5, Frank?

MR. WENSLAWSKI: I'm not aware of any specific problems. The overexposure that occurred at Trojan was a faulty instrument partly contributed to that situation. But it was not really as a result of any major program problem.

As far as I am aware, licensees generally have enough equipment for normal operations and outtages that they can

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handle them.

Calibration is usually a problem of some sorts in that when you bring instruments in off the line, you know, it creates problems.

But for the most part, I think they all have computerized systems that keep track of what instrumentation is due for calibration.

And I think if there is any problem areas there, it might be in what constitutes an adequate calibration. I don't believe that there is too much in the way of guidance there. Take 15 different instruments, different manufacturers, different ranges, they monitor different types of instruments. And it's kind of now up to the licensee who happens to do the calibration as to the type of calibration that they'll do.

I think that that might be a problem. They could calibrate it, but what actually constitutes -- if you actually get involved in it, what constitutes a calibration? You might find out all kinds of things.

MR. MIRAGLIA: The requirements state that instruments should be calibrated perhaps with some frequency. But nothing necessarily indicates the type of sources that should be used, what kind of energy spectrums, how many points per scale, what's acceptable.

MR. GIBSON: This new ANSI standard addresses that

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all very specifically. It's a good standard if it were enforceable.

MR. MIRAGLIA: Which means it would have to be adopted in our regulatory process by a reg guide of some sort.

MR. GIBSON: Yes.

MR. NEELY: The other thing associated with it, once they calibrate the instruments, they are put into use. Then the problem is how often do they check them prior to use or what ranges do they check?

I mean if they're going on just normal surveying, that's one thing. But if they're going to extremely high radiation fields, they don't have the sources out at the plants available to check the higher ranges of the instrument.

MR. GIBSON: We have found problems on contamination survey instruments. We found -- I know at two plants we criticized them for not having enough instruments to survey for contamination with surveys of people leaving contaminated areas.

Also, at two different facilities, we found that there was an error in their calibration of the friskers, the HP 210 probes. They were off by a factor of about 2 in a non-conservative direction because of an error on the source they were using to source-check these instruments.

MR. MIRAGLIA: I see you allow points.

MR. LYNCH: So they were using an arm meter detector

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exposure.

MR. GIBSON: On these instruments, you use a planchette source. It's a count per minute.

MR. LYCH: HP 210.

MR. GIBSON: Yes. And we carried our source out to check the response of their instruments and noted the discrepancy when we looked into it. In one case, I guess it was an energy response problem. But in the other case, an Eberline source was marked wrong that they were using.

MR. MIRAGLIA: How about your region?

MR. MURRAY: Region 4, they all seem to have adequate inventory of instruments to do, you know, routine, day-to-day work. As far as calibration, I don't really see that as a problem as far as gamma calibration.

The only instruments where calibration had been a problem has been our neutron calibration where, typically, a licensee isn't going to have a neutron source, and they end up sending it off-site and getting it calibrated.

That sometimes can be slow turn-around time.

But typically, to calibrate a gamma survey meter, they all do it in-house and it doesn't take that long to calibrate.

MR. MIRAGLIA: How about maintenance?

MR. MURRAY: Maintenance -- the easy maintenance, they will have their electronics techs look into it. If there is anything very involved, it usually results in that instrument

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being sent back to th vendor for repair.

MR. MIRAGLIA: Has the fact that there is no minimum requirements specified for instrumentation as far as availability numbers, et cetera, been a problem? Would you like to see something like that?

MR. GIBSON: I wouldn't.

MR. MIRAGLIA: Or would you prefer that there be some attention paid as to what's in the FSAR, to make sure there's some consistency of approach?

MR. GIBSON: I would prefer to see something, maybe some reference to the ANSI standard or something equivalent, to callibration, and maybe a requirement that they have capability for -- I don't know if we need anything beyond what we've got. We could ask for alpha, beta, gamma, a survey capability, but everybody's got it.

MR. NEELY: I think the burden is back on the licensee. If an inspector has been on site, he sees a job going on or they know themselves they have to do surveys, that their work is going to come to a stop if they haven't got the instrumentation. So it's really to their advantage to keep that stuff maintained.

MR. MIRAGLIA: How about requirements requiring maintenance there? Anything that can be done there to improve the situation?

MR. MURRAY: I don't really see anything. That would be difficult, I think, to put your finger on.

MR. MIRAGLIA: Let me ask another question regarding maintenance. At the various regions, at the various facilities, is there usually the maintenance -- instrument maintenance shop, the same shop that does all the instrument maintenance for the facility, including operational kinds of things, or do some health physics department have to call on their own maintenance type facility?

Does that vary? Like TMI apparently went through an instrument maintenance shop that responded to all instrument maintenance for the station, and therefore, when the requests came in, they got perhaps a lower priority of attention kind of thing.

Is that a common kind of thing?

MR. NEELY: If there's a problem in maintenance, it's usually the operations type instrumentation that comes first. And the HP will come, or all of a sudden they will know they've got to make an entry into an area. Then somebody in upper or lower management will make a decision to put priorities the other way.

But if the supervisor of anti-C instrument control is getting pressure from somebody else to get an instrument on line, whether it's for effluents or whatever, that's where he's going to put his priorities.

MR. MIRAGLIA: So in that sense, it may be a generic problem; is that fair?

MR. NEELY: It's on a plant by plant basis, I think.

MR. WENSLAWSKI: I can recall one time at Rancho Seco where much of the instrumentation that they have to callibrate is not directly safety-related, has a lower priority, and they had a backlog of some 600 callibrations. And that didn't in any way interfere with instrument radiation protection -- radiation survey instruments as far as priority, because they maintained them right on.

Yet our operating people, our operating reactor inspectors, were on top of them, trying to get them to build up that -- get away with the backlog. It took them about a year to finally catch up. So I don't know if you can really say that, because there is so much of balance of plant instrumentation has a fairly low priority associated with it. They have to callibrate just about everything under the sun.

MR. NEELY: I guess the point I'm making, it all depends on what plant, when they place the priorities, whether they fall out of the mode -- I don't think it s a big problem but it's there.

MR. GIBSON: I don't think it's a problem that deserves too much priority. I think you've got bigger problems to recommend solutions for. If we're going to make improvements on requirements in this area, I would prefer to see our attention placed on requiring something more specific in the way of callibration and response checks and this kind of thing.

MR. MIRAGLIA: I guess you would all generally concur on that?

MR. WENSLAWSKI: I think there might be one more area on that issue. I see you have on here "Issue Control." That is something that has always bothered me a little bit, as to exactly how, for instruments used at different plants -- and I'd like to hear the other regions address that -- and that some licensee might just place instruments at various locations throughout the plant, and people take them as they want. Other licensees might want to have closer control over them by their radiation protection people.

To me, I seem to have the impression that's a fairly lack of uniformity in the industry in that area as to how instruments are issued to people and who does the surveys and how can you assure that the people who are using the instruments -- this is kind of getting into training -- that they know that what they're going to interpret, can interpret the readings.

I'd just like to kind of hear how I, II, and III, maybe IV, too, primarily how they control the issue of the instruments.

MR. GREGER: Anybody that's done this, that does a survey that's going to be used by someone else, has to be qualified some way or another to make the survey. He is a rad protection man, typically, or in a rare instance he is

someone, an operator or an AO, who specifically should be qualified to make that survey.

So from that standpoint, I think -- I agree there should be some control over who can take a survey instrument to do a survey that's going to be used by someone else. But on the other hand, I think the survey instruments have to be available for anyone who wants one. Any operator in the plant that wants to pick up a survey instrument for his own purposes, to check on radiation levels, that instrument should be available to him to do so, whether it's available at a central location and he has to check it out, which may be a little more cumbersome than if it's available in the plant someplace, and he can pick it up more conveniently.

I'd rather see him pick this instrument up and use it himself and perhaps lose a very slight amount of control on who's got the instrument, than for him to go and do his job without paying any attention to the existing radiation levels.

MR. LYNCH: Have any of you ever experienced utilities indicating they have lost instruments, say through trash compactors and things like that?

MR. NEELY: Yes, I have, during outages. 1913 319

MR. LYNCH: How does that happen?

MR. NEELY: They'll lay them down on a box, or the cleanup crew comes through, or they just happen to get --

they're laid on a bunch of plastic on the floor, maybe somebody rolls it up.

MR. LYNCH: Doesn't notice the weight change.

MR. NEELY: No.

MR. GREGER: I think that has to be uncommon, though.

MR. NEELY: It's not something that happens every day.

MR. GREGER: Of course, they lost all sorts of masks and respirators at TMI-2 that supposedly went to the compactor.

MR. GIBSON: Lost something over a million dollars worth of tools at Surry over a period of a year and a half or so. They suspect -- they fired a number of people over it. But they suspected they were going out in waste drums and being perhaps unloaded along the way.

MR. NEELY: One licensee claimed he lost a teleticker. How do you lose a big instrument like that?

MR. GIBSON: Region II lost five Z-tech survey instruments.

MR. LYNCH: At the region?

MR. GIBSON: That was at TMI.

MR. NEELY: We've got quite a collection of those.

As far as Region I control on instruments, it varies from plant to plant. Some of them, they're under lock and key. They've got a central control point, say the HP office, and

they issue them so they can retrieve them in case they don't bring them back when they come around for callibration, they know where it's at.

For high rad entries, they want to make sure the person assigned that instrument knows how to use it. So they more or less train him on the spot. Or they will assign one to the control room or to the aux operators. Usually most of them in the region will have control over where they are at. There's a few that are floaters.

MR. MIRAGLIA: TMI's practice was just to have them out there.

MR. NEELY: So I understand.

MR. LYNCH: Come by and pick one up.

How about Region IV, Blaine?

MR. MURRAY: By and large, most of the main body of the inventory is kept at the health physics office. Somebody wants to use an instrument, they come by and ask the health physicist for the instrument. Like Don said, there is also cases, you know, particularly during outages, there may be -- they may leave a couple down at the entry into the drywell, or in containment PWRs they will leave a supply of survey meters there.

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But for routine normal operations, they are normally kept at the health physics office.

MR. MIRAGLIA: Frank, we'll give you an opportunity

to tell us about Region V. You just told us you'd like to hear about everybody else.

MR. WENSLAWSKI: That's why, because I really don't see a uniform method of control in licensees. Kind of each vary. I guess there's nothing wrong with that. I just sometimes have feelings that it may be inconvenient sometimes, because of the control over survey meters, for a person to do a survey and surveys may not be getting done all the time, specifically, with the requirement in tech specs that says the entry into a high radiation area shall have a continuous reading dose rate meter. And we are not there all the time, obviously.

But I have a very sneaky feeling that if we were, or if perhaps we had resident inspectors check it, I don't know, but we would probably find that many of these entries or personnel are not carrying radiation survey meters. They're going on, oh, I've been through this area six times this week, I know what the radiation levels are, I'm not going to get an instrument, I'm not going to go through the hassle of going all the way over to point X to check one out.

MR. MIRAGLIA: One of the things I tried to do in getting prepped to meet with you fellows is I asked the computer to spit out t' 776 summaries for six selected facilities in each of the regions. And man, that's a common one, the one that you are just pointing out, the failure of

an entry into a high-radiation area wasn't preceded by a survey or carrying a reading. That was one that seemed to be a pretty consistent --

MR. GIBSON: It's easily enforceable.

MR. MIRAGLIA: Most of them are.

MR. NEELY: I found that most of the operations inspections of health physics during power outage -- we selected some ion chambers at random off the shelf at the physics office, and they were PIK-6 type. And we asked the technicians who issued them out how they determined whether they were operating or not. And he put a small check source on them to get a response. He didn't have any acceptance criteria. He was just looking for a response.

So we asked him what if it was real, real low on the scale. He wouldn't take it out of service. So we asked him to put it on the callibrator. We put this particular instrument on the callibrator and it responded on the first reading, up to 1,000 millirem. But when it switched to the R range, it didn't respond.

So we went back and pulled some more off the shelf and found several others that didn't respond, either, on the high range.

MR. GIBSON: We have observed that same thing.

MR. NEELY: We called the manufacturer, and apparently it was an electronic problem in that particular

time frame, that those instruments were put out to the utility.

So we had to immediately call to take them out of service. And then as we went along, we found out they couldn't even callibrate with the procedures they had. So one thing led to another. That's why I'm bringing up the check sources, whether they go to the higher ranges. But this is the instrument that was being provided to people for going into the high radiation area.

MR. LYNCH: Any overexposures occur during that time?

MR. NEELY: No.

MR. MIRAGLIA: How about with respect to the fixed instrumentation in the facility? Are there problems with that area, radiation-wise, or is it in-plant in-process instrumentation, with respect to maintenance?

MR. WENSLAWSKI: We had some real problems at Rancho Seco on callibration of those monitors, because they require going into containment, because they require entering containment and doing callibration. And the INC techs refused to do it. They said it's not for them to go in there and do it in operation in order to callibrate them. They said you should have scheduled it during a shutdown period.

And licensee says, I can't schedule my shutdowns, other than refuelings. But that was just an old thing that

the union up there really picked up on and really caused a fuss. I think that's something, though, that can be designed around.

MR. NEELY: Several of the plants in Region I, they're not required by tech specs to callibrate them on a specified frequency.

MR. MURRAY: Area monitors?

MR. GIBSON: We accept just comparing the area monitor reading with the portable survey meter held in the same vicinity as a probe.

MR. MIRAGLIA: Is this an area that can be improved?

MR. GIBSON: I don't have any problem with requirements. Maybe the other regions do.

MR. GREGER: I don't, either. I think you can probably go in any plant in our region and find at least one area monitor wasn't functioning. They seem to be quite susceptible to operational problems.

MR. NEELY: They serve a useful purpose. They should be set up on a frequency. Whether three months is the number, I don't know. Maybe since it's not really the controlling factor --

MR. WENSLAWSKI: I think six months is what's in the standard tech specs.

MR. GREGER: I don't know of too many tech specs that don't have a requirement for tech specs.

MR. NEELY: I know of two plants.

MR. MIRAGLIA: With respect to -- you know, we've talked about the general experience. Let's get into the accident situation. At TMI, that pointed to certain deficiencies. They didn't have enough instrumentation. They had four emergency kits, and one kit wasn't fully equipped. The second kit had one instrument that became inoperable shortly after it was put into service. So effectively they had four emergency kits.

And the instrumentation in those kits -- well, essentially, they had two useful ones.

MR. GIBSON: Frank, you raised an interesting point that had escaped me. We're talking about whether or not facilities have enough instrumentation for routine operations. I had forgotten that TMI had an accident. Should we require licensees to maintain a low level limit of certain instrumentation, to be prepared for an emergency.

MR. MIRAGLIA: The point I was driving at now was, you know, at TMI it said it had four emergency kits. Is there some minimum specification that we talk to in terms of what should be in an emergency kit.

MR. NORTH: I think, Frank, you can't overlook the possibility that a licensee relies not only on his emergency kit, but he relies on his normal stock of instruments in the event of an emergency.

MR. MIRAGLIA: That's what I'm saying. We have to couple these two things now and say, at TMI it told us something or it should tell us something, and looking at emergency kits, emergency supplies, what should be available on-site or in close proximity to the site.

MR. NEELY: That's the comment I was making before. I'm not sure whether they have enough out there. I was talking about emergency kits. We are looking at one thing to support the plant activity during the operation and refueling. But what happens -- is there enough there?

MR. LYNCH: Probably, if TMI didn't have the huge backlog of portable survey instruments being repaired at the time of the accident, there's a good chance it would have had sufficient instruments to last the few days -- a couple of days.

You know, an instrument has a certain lifetime in the field and it has a certain callibration period or repair period, which is usually like a week sometimes, because you can only callibrate so many instruments so fast, with that facility, if the facility is available; that one of the things that might be thought about in an emergency response is the planned replacement of instruments from other utilities. It wasn't planned so much from TMI, but the other utilities did certainly just in and help.

MR. MIRAGLIA: We've touched on two areas. First

of all, the ones I wanted to elicit your comments on are the emergency kits themselves and what's the experience out there. At TMI they had four kits.

MR. LYNCH: They were for off-site.

MR. MIRAGLIA: They were for off-site. And also, they had as part of their plan, as Harry points out, they would contemplate to use their normal site complement to also assist in responding to the emergency.

To get to Al's point there, should there be some, at all times, X number of instruments in a state of repair such that one can respond; and then also to look at what's available for the emergency response off-site.

MR. GIBSON: There's no question but what there should be. I don't think anybody can argue that. At TMI there was a shortage of instruments, and that could occur somewhere else. I guess then the question becomes, what should NRC do about it? Should we issue guidance or should we issue requirements? Probably guidance, I would say.

MR. LYNCH: In the same vein, for off-site, at TMI they didn't have any transportation plans for off-site and they relied on helicopters that they had to call in and vehicles that they had to commandeer. And it might be prudent, as long as you are specifying instruments, you might also think about vehicles with radio communications.

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MR. MIRAGLIA: But in trying to look at what's available out in the field at the other utilities and what is the experience with emergency kits and are they kept in repair, is the inventory of types of instrument, types of materials, in other words, generally consistent? Does it vary? Do we have any specific set of requirements?

MR. MURRAY: You're going to find it varies from plant to plant. Now this same subject has been discussed; I can remember at least two or three other counterpart meetings. I think there are certain -- it's just not a case of survey meters, but it's everything: respirators, clothing, air samplers, the whole gamut. What is the minimum inventory that should be maintained? As far as I know, there isn't any guidance out.

I don't know how NRR handles it when an applicant submits their emergency plan, but I'm sure when they look at it, they're going to require that they have certain items in these kits. But as far as I know, there isn't any Reg Guide or guidance out as to what the kits should consist of.

I have licensees -- maybe they'll have three emergency kits, and they may have an inventory of 15 ion chamber rate meters. You go to the next one, and they may have one in each one for a total of three.

It varies a lot what is kept in their emergency kits. I know some of them rotate the instruments out. They use them

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in the plant. They put them in the kits back in the plant. Others say, no, that's for the kits and that's it. They don't move from those kits. We want to make sure they're kept there.

So it just varies. But it's not just survey meters. It's the whole -- all the supplies and equipment that is maintained in the kits.

MR. MIRAGLIA: Same thing with maintenance of an instrument. They had an apparent history -- apparently they had been cited for an instrument being inoperable three or four months before the incident or maybe even longer, and on the day of the incident, that instrument was still not repaired and calibrated.

MR. GIBSON: That's right. Also, as you mentioned earlier, the Region I inspection reports had identified a problem on slow maintenance previously. And it's interesting that when we discussed our investigation findings with Jack Irvine and Bob Arnold, both of them had been aware that this had been a continuing problem, which indicates to me that it must have been a fairly serious problem to have come to their attention. So --

MR. LYNCH: You look at some of their -- the audits, and you will find notations by people --

MR. GIBSON: Bob Arnold automatically began to debate the findings with us, like he did every finding.

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Then Jack Irvine said something to the effect that, "Oh, Bob, you know this has been a chronic problem ever since we've been here. We don't have much defense on that one." So they went on to the next one, which led me to believe that it really had been a problem that they were aware of.

MR. NEELY: Well, it's still a problem there. We had a situation the other day where they have low volume air samplers in the auxiliary building. There are six of them. They are permanent locations where they sample different elevations. The samplers that were on the motors, stickers on the motors were overdue for calibration by as much as 45 days. I asked why they hadn't been replaced; they didn't have any backup motors to put on them, so they just left them out of calibration -- overdue for calibration.

We told them to take them out of service, one at a time, calibrate them, and put them back in. But the problem hasn't gone away.

MR. MURRAY: Just a point in passing that comes to mind. When I was up at TMI -- earlier we talked about they had an emergency situation that they could bring in instruments from other licensees. I remember one time when I was in the aux building at TMI, and they had four or five instruments out on the table that they were using to establish dose rates in the aux building. I jotted down the

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serial numbers, and when I got out of there, I went about trying to track down the calibration history of those meters, and no one knew. You know, they came in from off-site. No one was ever able to establish that those meters were ever calibrated.

MR. MIRAGLIA: So any type of response or plan that would consider that kind of thing would have some sort of disciplined approach besides bringing the meter, bringing its calibration history, et cetera.

MR. MURRAY: These were the meters that were under heavy use there in the aux building. They come out --

MR. LYNCH: No checks or sign of issue or anything like that?

MR. MURRAY: They don't know where the instrument came from to begin with. It came from off-site someplace. It wasn't their instrument.

MR. LYNCH: And they weren't concerned about its calibration either.

MR. MURRAY: Well, you know, I just -- it was just one of the many things that probably happened during the accident. They were just happy to get the instruments, and the fact that the calibration records hadn't been verified was probably overlooked.

MR. MIRAGLIA: What is a typical -- if there is such a thing -- say for a two unit station, complement of --

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how many emergency kits and general characterization of the contents of that kit for a two unit station as opposed to -- well, I'm saying my reference point is TMI with three kits with, I guess, one iodine detecting instrument and, I guess, just a survey meter.

MR. GIBSON: But only one kit was required, by the way.

MR. MIRAGLIA: With the understanding that there's no specified minimum and there's no guidance that we have issued with respect to these kinds of things, but what typically would one expect to find?

MR. MURRAY: I'd say, typically, you'd expect to find a kit in the control room. In the control room, I would say you would want three or four ion chamber rate meters, zero to 25 r per hour or something like that, five or six respirators, NICs, maps, all these types of things and also a kit at the off-site emergency control center. And this is probably where you're going to find most of your emergency equipment maintained -- would be in that kit there.

MR. MIRAGLIA: When you say off-site --

MR. MURRAY: I imagine at TMI it was the visitors' center. Then another kit at an alternate off-site emergency control center in case the primary center -- that's where the plume happened to be, and you couldn't set up there.

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But I'd say a minimum of three kits, and they would all be — you know, I would think pretty much the same inventory supplies and equipment in all three kits with probably the biggest inventory maintained at the primary off-site emergency control center.

MR. MIRAGLIA: Is that something you would see or would expect to see in Region IV, Blaine?

MR. MURRAY: That's the way we're set up there, so that's what I base my experience on.

MR. MIRAGLIA: How about Region V, Frank?

MR. WENSLAWSKI: The only two unit site we have is Diablo, and I haven't had access to that to inspect it for a few months, so I don't know. North Diablo happens to have emergency kits. There are more than three, but there are three principal locations — one on site, and because of the particular geographic location. There is a mountain range between the populous area and the site, and it's accessible from both ends only. They have kits located at each end of the range along the road, and people responding to an emergency can obtain instruments at either of these locations.

However, the inventory of instruments, as I recall, is pretty small. It's a couple of ion chambers and a couple of GMs, something like that, an air sample and some anti-Cs, and something like that. They don't have a large inventory

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of off-site instruments.

MR. MIRAGLIA: Do they have capability for detecting iodine.

MR. NORTH: Yes, they do, but they don't have a scientific -- they use a charcoal cartridge, and they carry a compressed air bottle to blow the bubble gases off with. When I go back, I'm going to have some other ideas. But I think that the idea of having kits out is somewhat dependent on the geography of the site. I think that to say Diablo probably is all right with basically three locations for kits, but if you have something like Three Mile Island, he may want them located at the cardinal points of the compass away from the site, something like this, so that people responding from off-site can pick them up as they come in rather than to have them just at a couple of locations off-site.

MR. WENSLAWSKI: I can give you Rancho Seco on-site. I have some insight on what they have currently on-site. They have three locations on-site where they store emergency gear. One is at the control room, and one is in their administration building, and one is in a warehouse on-site. The equipment in these sites -- that is maybe two to three survey instruments, one air sampler, and maybe four or five Scott air packs at each site, and then the usual array of emergency gear for NIC clothing, that type of

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stuff. But they don't have five or six or ten instruments at each one of these locations -- just a couple, and they're prepared for on-site. They're not really geared for off-site because they have been told that they don't have responsibilities off-site. Traditionally, that's what utilities have been told. The counties and the state respond and do the off-site monitoring. The utility stays on-site.

So I think you will find that most utilities don't have a big cache of emergency instrumentation standing by, prepared to go out off-site in five different directions at once because they're not planning on doing that.

MR. MURRAY: When I say off-site emergency control center, that would be the control center the licensee would be using for entry into the plant that you would normally locate outside of the restricted area of plants, like a visitors' center, a guard gate, or something like that.

MR. GIBSON: I don't think I have anything to add to what's already been said. What's been said is typical of our region, too.

MR. GREGER: I would agree. Our section doesn't look at emergency planning, but I would agree that it sounds logical to have a minimum of three different locations. We do require primary and alternate off-site command posts, and those would certainly be locations where you would want at

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least one other set in the control room. Well, probably in the control room because that point is designed to be manned.

MR. MIRAGLIA: Don, how about Region I? Are they all typical of what was at TMI more or less?

MR. NEELY: I can't really say. Our inspection program is set up at the regional office the same as Region III. That's covered by another section chief, and our responsibilities aren't really there, so I couldn't get to the individual responsible to that area to get some information for this meeting.

MR. GIBSON: One thing we didn't talk about is the counting room.

MR. MIRAGLIA: I was going to talk about that next.

MR. GIBSON: Okay.

MR. MIRAGLIA: One of the things that happened at TMI --

MR. NORTH: Are you getting into that right now?

MR. MIRAGLIA: We can quit for the day.

MR. NORTH: I had another question in the area. Since this is emergency planning instrumentation, I have gathered that the complement of instruments varies both in kind and in quantity as well as capabilities for sampling for iodine or airborne particulates, whatever.

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Do you have any feelings concerning a standard emergency kit, either as to the type of instruments contained, the quantity of instruments, the type of airborne sampling equipment, something that would be specified?

MR. WENSLAWSKI: There's one area that I think should be standardized, Harry, that isn't, and that's the capability of monitoring for iodine. You talk about what Diablo has proposed, and I have always challenged Ranch Seco's method of just taking charcoal sampling and putting in HP 210 on it and saying it's all iodine. I just don't think it's very accurate.

MR. NORTH: I think Fort St. Vrain established that, didn't they?

MR. GIBSON: Yes. That's effectively what TMI did.

MR. WENSLAWSKI: I think that's something that needs attention. How in the field, under field conditions, is a good acceptable way of monitoring radio-iodine and know whether you have radio-iodine?

MR. MURRAY: I think that was one of the items identified in this Lessons Learned Task Force -- that there were, you know, right now there isn't any acceptable means of monitoring for iodine by field survey teams or stack monitors. And that was identified as an item that needs to be followed up on.

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MR. GIBSON: That's one of the things that we identified in our lessons learned for stack monitors. We didn't discuss stack monitors either. It applies to environmental monitoring. You're right, Blaine, that is a generic problem. I doubt if there's any licensee that has a good solution to field environmental iodine measurements in the presence of high level gas concentrations.

MR. MURRAY: Unless you have a jelly system.

MR. MIRAGLIA: That was going to lead me to the topic that Al just pointed out. Perhaps the system would have responded better had they not also, coincident with all the things going on, lost that tested area.

MR. GIBSON: Even so, that requires that you take a sample back to some other location for counting. It would be more desirable to come up with a measurement right on the spot.

MR. LYNCH: DOE did feel -- I think they had four portable spectrometers, very portable, as a kind of a test. And one comment I got from them is they wish they had more of those, and they wish they made more use of the ones they had there because that was very quick to determine what the isotopes were. And they were portable units, suitcase size.

MR. NORTH: I ran across an advertising blurb that gave essentially no information, but Studvik has reported they have developed a field iodine monitor. It's designed

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for response to emergencies. Has anybody seen anything about it, heard anything about it?

MR. GIBSON: I think even if there are a few such things advertised, I believe it would be appropriate to recommend that NRC sponsor research on the subject and come out with some guidance to the industry.

MR. MURRAY: That was addressed in that Lessons Learned Task Force. That was one of the areas where they wanted NRC to specifically evaluate what's a -- as an off the shelf item and what should be done in developing acceptable systems for iodine monitoring. I don't know what their timetable is, but it was identified.

MR. MIRAGLIA: Why don't we just cover the counting room question, and then we'll adjourn for the day. With respect to the counting room at TMI, they lost all on-site capability to perform any meaningful analytical measurements. And I guess TMI is unique in that they had the incident occurring in 2 and the sample lines for Unit 2 being in sample 1. Do they just have one counting room, or do they have two counting rooms?

MR. GIBSON: They had two counting rooms, but the system in the other room never worked.

MR. MIRAGLIA: That's right. They never set it up. And is it reasonable to say that either within the design of a facility or in emergency response and planning

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that some sort of counting system be available waiting for potentially contaminated areas -- is that stretching things or is that a reasonable kind of thing?

MR. WENSLAWSKI: It's something in the back of my mind.

MR. LYNCH: How is it with the other facilities? Are they all going to be in the same boat if they all had a TMI-type accident?

MR. WENSLAWSKI: That's what I was going to say. It's something that's been in the back of my mind long before TMI. Is there likelihood of a licensee being able to use his counting room in the event of a major nuclear accident? I feel the likelihood is about zip. He's going to cramp it up in two seconds flat.

We have one facility -- I don't really know about the rest of them -- but I know we have one facility on our own without any urging by the regional office that has set up a backup counting lab with an Army lab that happens to be 25 miles away as part of their emergency plan. That's Rancho Seco. They've done this years ago.

MR. GREGER: Whose equipment?

MR. WENSLAWSKI: It's the Army's equipment. It's an Army major radioactive calibration facility. They don't have a jelly detector, but they do have sodium iodide detectors, and it's better than nothing. They have a lab

there, and they made arrangements with them years ago to service them.

MR. MIRAGLIA: In general, in Region V -- you don't have that many multi-unit stations.

MR. WENSLAWSKI: We don't have any operating.

MR. MIRAGLIA: Would each station have its own counting room, or do some multi-unit stations --

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MR. NORTH: Diablo has a single aux building, and two units, and one counting room.

MR. MURRAY: Radiochemistry handles both units.

MR. GREGER: TMI may be the only facility in the country with two counting rooms.

MR. NEELY: There's two licensees.

MR. GREGER: We have at least one facility with two counting rooms.

MR. MIRAGLIA: So, it was uncommon in that it did have two counting rooms?

MR. GIBSON: Yes.

MR. MIRAGLIA: It was unfortunate that one counting room, that they had some limited access to --

MR. GIBSON: I don't think we should lose sight of practicality, either. Let's keep in mind that by the end of the day, NRC's mobile van was on-site, and shortly thereafter B&W was there. Now, I'm not sure that they could mobilize, even if they had a mobile lab parked at their corporate office. They may not be able to respond much faster than that.

MR. NORTH: But I think that you had something working for you there, that would not pertain --

MR. MIRAGLIA: Let me ask the question: how many of the regions -- I think I know what the answer is but let me ask the question. Region I has how many mobile

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laboratories?

MR. NEELY: One.

MR. MIRAGLIA: One. You use it for both safeguards, as well, or do you have a safeguards van and a radiological van?

MR. NEELY: Radiological van, there's only one. And it ws at Millstone at the time.

MR. MIRAGLIA: How about Region II?

MR. GIBSON: We have only one, plus safeguards. I am not sure the safeguards would be very useful, but it might be usable.

MR. MIRAGLIA: How about Region III?

MR. GREGER: We have one, at the time -- I'm not really up on this.

MR. MIRAGLIA: Is that safeguards or radiological?

MR. GREGER: As far as I know, it's used for both purposes at the present time. They're talking about getting a second one.

MR. WENSLAWSKI: They're getting another one.

MR. GREGER: Yes, we are getting another one. We don't have it at the present time.

MR. MIRAGLIA: Region IV doesn't nave any?

MR. MURRAY: No.

MR. MIRAGLIA: Region V doesn't have any?

MR. WENSLAWSKI: That's correct.

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MR. MURRAY: We're getting one. It's been budgeted.

MR. MENSLAWSKI: IV and V are supposedly going to be getting a van, one region before the other, supposedly, because there's only money -- if there is money in a supplementive budget, it's only enough for one region.

MR. MURRAY: Let me make a comment on counting rooms. I can think of two reactors in Region IV where -- one's a PWR, where the counting room is located in the aux building. On numerous occasions where they've had radioactive releases into the aux building -- we're not talking something like TMI, but just a spill. The background in there gets so high that they have to evacuate the counting room. Here's a counting room stuck right in amongst -- I think it's right next door to the gas decay tanks and right next door to the -- down the hallway to the liquid storage tank.

But, you know, it's just poor design. If they had a problem there, not a big problem, just a small problem where they have to get in and use their jelly system, they couldn't do it. The same thing exists at Ft. St. Vrain. There the counting room is right in the reactor building. They have releases in there; they have to get out of the counting room, let it cool off for half a day, and get back down. They've just had small problems. Those two

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facilities, they would not be able to use the counting room.

MR. WENSLAWSKI: It doesn't take much to knock a counting room out. At Rancho Seco, they had a leaking valve in their sample room, which is the same room around the corner from where they had their jelly. But just a drip in that system put their jelly out of service, and they spent a couple of days trying to track down the source of airborn contamination in that part of the aux building, because the leak was so small. But it doesn't take very much to put these systems out of service. This was in a hood, which had negative pressure as well.

MR. MIRAGLIA: I guess we heard from Region I?

MR. NEELY: Right. Region I is pretty much -- they have one counter.

MR. MIRAGLIA: Do you have anything else on instrumentation?

MR. NORTH: No.

MR. MIRAGLIA: It would be a good point to adjourn the meeting. It's been a long day. I thank the court reporter.

Tomorrow morning, 9:00 o'clock, not in this room, we'll be in the Phillips Building, P-422, which is the fourth floor of the 11 story building. You go in the main entrance of the Phillips Building, take the elevator up to

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the fourth floor.

(Whereupon, at 4:00 p.m., the hearing was adjourned, to resume at 9:00 a.m. the following day, in the Phillips Building.)

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