Transcript of Proceedings

UNITED STATES OF AMERICA

PRESIDENT'S COMMISSION ON THE ACCIDENT AT
THREE MILE ISLAND

DEPOSITION OF: MICHAEL PARSONT

Bethesda, Maryland

August 13, 1979

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DEPOSITION OF: MICHAEL PARSONT

Room 218
5650 Nicholson Lane
Bethesda, Maryland

August 13, 1979
10:25 o'clock a.m.

APPEARANCE

On Behalf of the Commission:

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Washington, D.C. 20037

On Behalf of NRC:

PAT DIXON, JR., ESQ.
Office of General Counsel
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Washington, D.C.

I N D E X

WITNESS:	DIRECT	CROSS	REDIRECT	RECROSS
Dr. Michael S. Parsont	3			

EXHIBITS:	IDENTIFIED
1	5
2-12	75

P R O C E E D I N G S

MR. PEARSON: This is the deposition of Dr. Michael A. Parsont of the Nuclear Regulatory Commission. Dr. Parsont, have you ever had a deposition taken before?

DR. PARSONT: Yes, I have.

MR. PEARSON: Okay, then you are aware that the testimony you give today has the same force and effect as the testimony that you would give in a court of law?

We should swear in the witness.

Whereupon,

DR. MICHAEL A. PARSONT

having been first duly sworn, was called as a witness herein and was examined and testified as follows:

EXAMINATION

BY MR. PEARSON:

Q Because you are testifying under oath, please try to be as precise as you possibly can in your answering. And if there's any questions that I ask that are not clear, make sure that you stop me quickly, and I'll clarify them.

Would you tell us your whole name and address for the record, please?

A My name is Michael A. Parsont. Do you want my work address -- in the Office of Standards Development of Nuclear Regulatory Commission, address Washington, D. C. 20555.

Q And what position do you occupy with the NRC?

A I am Chief of the Radiological Health Standards Branch.

Q How long have you been with NRC?

A Since 1972.

Q Can you briefly characterize for us the jobs and the responsibilities you have had between 1972 and the present?

A Yes. From 1972 until 1976, I was in the Radiological Assessment Branch of the Office of Nuclear Reactor Regulation. I did health analyses of applications for nuclear power plant licenses. In addition, I did special studies in radiobiology. I performed consultation services with other offices and staff members, gave testimony at licensing hearings, and performed under the title of radiobiologist.

Since that time, I have [illegible] in the Office of Standards Development of NRC, first as a radiobiologist, also evaluating the health effects of ionizing radiation, and since November of 1978, have been Chief of the Radiological Health Standards Branch.

Q When did you first transfer to the Office of Standards Development?

A In October of 1978.

Q October of 1978? Could you characterize again

briefly your educational background?

A Yes. I have a Masters degree in Radiology, and a Ph. D. in Radiation Biology, from Colorado State University. I have a Bachelor of Science Degree in Environmental Sanitation -- Public Health, from UCLA, and I have done additional graduate work in sanitation engineering, genetics, and endocrinology at the University of California, Berkeley.

Q Have you taken any courses or graduate work of sorts sponsored by the NRC, or since you've been with the organization?

A Yes, yes, I've taken ~~a statistics course, a number of -- well,~~ at least one computer programming course, and a number of management courses.

Q I have here a document entitled, "Professional Qualifications of Dr. Michael A. Parsont." Could you tell us what this document is, very quickly?

A It's just a brief resume of my work experience, both within NRC and prior to coming to NRC.

Q Is this document accurate to the present time?

A Yes.

Q Okay, I'll mark this Deposition Exhibit Number 1.

(The document referred to was marked for identification as Exhibit Number 1.)

BY MR. PEARSON:

Q Would you tell us your current responsibilities in your position as Chief of the Radiological Health Standards Branch?

A I am responsible for the determination of health effects from NRC-licensed facilities, both medical and from power production facilities. I am Project Manager for a radiation and epidemiology study currently being conducted.

Q This is a particular study?

A Yes. Yes, it's a study that has been mandated by the Congress. I'm responsible for developing radiological health standards and guides, and for the evaluation and assessment of radiobiological health impacts, on the public and on workers, from both proposed and licensed NRC activities. I also act as an advisor and coordinator within the NRC, and I participate in both national and international meetings and groups in the areas of radiological health effects.

Q If you have responsibility with respect to developing radiological health standards for workers, how do your responsibilities vary from those of Mr. Alexander?

A Basically, my branch develops the health effects results from exposure, and it really doesn't make much difference whether the people are industrially oriented or in

the general population. It applies to both. So, whereas Mr. Alexander's branch actually gets into the industrial community, and writes regulations and guides with respect to how workers operate within those facilities -- the materials that my branch develop relate to the effects of the exposures, and Mr. Alexander can then apply those --

Q I see.

A -- or the group, the Office of Standards Development, applies those in the regulations.

Q I see, so you determine what exposures may or may not be acceptable, and then his group would implement procedures to assure that exposures not exceeding the recommended levels would not occur. Is that fair to say?

A We don't use the term, acceptable -- permissible.

Q Permissible?

A Right, because what may be a permissible exposure to the Commission may not be acceptable to the person or population.

Q Okay. Would it be fair to say, then, that ~~you~~ research staff determine what exposures are permissible, and Mr. Alexander's group then determines procedures to assure that exposures beyond the permissible levels will not occur?

A Yes, that's a fairly accurate description.

Q Okay. I'd like to direct our attention just for a minute to the actual branch within which you work. Would

you tell us how many employees it has, professional and clerical, and what their responsibilities are?

A Yes. We have six professionals, other than myself, and one secretary. The background of the professional people range from radiobiology and epidemiology, to health physics and nuclear engineering. We have two health physicists who are primarily responsible for writing regulations for the medical side of the house, and the other four are primarily responsible for the general radiological health effects, populations, and considerations.

Q When you refer to the medical side of the house --

A Yes.

Q -- what do you mean?

A This relates to the use of radiopharmaceuticals -- safety of radiopharmaceuticals and medical devices using radiopharmaceuticals.

Q Okay. You said there are seven professionals and one secretary for your particular branch?

A Yes, that's correct.

Q Okay. Is your entire branch located here in this facility?

A It is, yes.

Q Are there any other branches within NRC that do comparable work to the work that your branch does?

A Generally, the branches within Office of Standards

Development are support-type branches. If regulations and guides are necessary, generally, other offices request that the Office of Standards Development write those guides. So there are individuals within NRC in other offices who have similar responsibilities, let's say, from the standpoint of training in radiobiology, or of training in the medical area.

For example, in NMSS -- and I can't remember what that stands for -- Nuclear Materials and Systems Safeguards, or something like that, I can't remember what that is -- that is the office with primary responsibility for the medical area.

If, let's say, a petition comes in to them, and -- requesting a rule change or a new regulation, then that is transmitted over here, and we write that rule. We put it together for them. In the Office of Research, there is a radiobiologist, also in Nuclear Reactor Regulation, there's a radiobiologist. Both of these individuals are capable of calculating health effects. So there is expertise of a similar nature to what we have in this branch, also represented in other offices in the NRC.

Q Would it be fair to say that any regulation that the NRC would promulgate, relating to radiation levels, permissible levels for the public or for workers, would generate from this office?

A I may have been a little misleading before. The permissible levels are part of 10 CFR, Part 20. They're stated there. If we were to attempt to change those, then we'd have to go through a rulemaking procedure, and at that rulemaking procedure, let's say, there's a hearing -- then the evidence would be presented on both sides, and recommendations of the staff and intervenors and whomever would be presented, and then the recommendations, or the levels, would be changed.

We can't do that directly here. We can recommend that certain levels be changed, and recommend the extent to which those levels are changed, or should be changed. But it's really the Commission that makes the change --

Q Okay.

A -- and not this office.

Q Would this office begin any rulemaking proceeding that would finally result in a change of this sort?

A In response to a petition, we would make recommendations on the petition -- make recommendations to the Commission, as to whether a hearing -- whether we would recommend a hearing or not. The Commission can then independently decide whether or not to hold a hearing, and at that hearing we can recommend -- so in that sense, we initiate it.

Q Could you initiate a rulemaking procedure on your own initiative, without the receipt of a petition from an

outside party?

A Yes. Yes, I'm sure we could. If we find that there is sufficient evidence of research and so forth on the outside, that would indicate that our standards needed change -- the regulations needed to be changed, we could.

Q Has that ever occurred?

A Not in my area. I'm not sure whether -- I'm not familiar whether it has. I don't know.

Q Okay. Do you have any requirements for either education or experience, for those persons who work with you within this branch? Are there minimum requirements that they must meet in order to be employed in their respective capacities?

A Each position has its own description, and the requirements of education and experiential are part of that description. And then candidates are interviewed against the criteria set in the description.

Q Could those requirements be made available to us?

A Sure, copies of the position descriptions.

Q All right, and could you also make available to us the statement of professional qualifications for each of the professional persons who work with you in this branch? Could that be made available to us?

A Yeah, they would have to be written up, because generally these are written up when we go to give testimony,

so I imagine that we could have the branch members write them up.

Q Okay, it shouldn't take too long, just something --

A Okay.

Q -- very brief, for our purposes. I'd like to talk for a minute about how the procedure of promulgating regulations is actually undertaken. The initiating event, we've already decided, would be either a decision by the NRC itself to commence a rulemaking, with respect to the permissible radiation levels, or the receipt of a petition.

Once that initial event occurs, what is the very next thing that happens in the rulemaking procedure?

A I'm not sure I can give you a really accurate answer to that. I'll just give you what my impression is. Generally, the petitions don't come directly to this office. They come into another office within NRC, or they go to the Commission directly, and they come down then.

The assignment -- that is, to say the Assistant Director and then down to the Branch Chief that's going to handle this, is then made, and written responses to the petition are put together.

Q What would the response say?

A There has to be a technical evaluation. In other words, if it's a technical point, based on scientific -- or some data, then people within the organization make an

analysis of those data, and the arguments, and come up with, let's say, a branch position. The material usually is not restricted to treatment by just one branch. Usually, there will be other organizations within NRC involved. If NRR has a piece of it, then that portion of the petition -- any specific questions that are asked, that NRR can answer, are sent over there for their input, and then when all of the input is gathered, the position paper is written and circulated for concurrence, both throughout the other offices and through the Executive Director.

Finally, that paper goes up to the Commission for their decision as to whether or not there should be a hearing, or it may be that the recommendation is to deny the petition, and the Commission can say, we'll go along with this or not, as they see fit.

Q Okay. If a petition would come in -- say, let's change the levels in 10 CFR Part 20 to this or that -- in analyzing whether that petition should or should not go to the Commission with a recommendation for a hearing, or a recommendation simply to deny it or whatever, would the members of the NRC go beyond the data presented in the petition?

A Oh, yes. Oh, yes. We use whatever data that we can to make the decision.

Q Would that be data on hand, or would you also seek

new data?

A We attempt to get all of the current data we can to make a decision. It's just not good policy to take it on a few -- you know, make decisions on a few limited pieces of information. Even if the information upon which the petition is based, is not solid -- on solid scientific grounds, we do -- generally, in my understanding, we do a terrific job of going in there and picking out the information in the scientific literature upon which to make a decision.

Q How long does it take generally, if there is such an assessment, between the receipt of the petition and the time that the offices within NRC would review it and submit it to the Commission for the initial decision?

A A long time, usually. Generally a number of years.

Q A number of years?

A Yes, unless there is some really hot potato. For instance, the NRDC submitted a petition in 1975 or '76. We're still acting on that -- very, very bad. It doesn't look good, and it's not good.

Q What do you mean, it's not good?

A In other words, yeah -- the impression is created that we're not actively pursuing the response to the petition. I would say that for a petition on substantive matters to be processed and completed by the staff -- that is,

the technical review, if it takes a year, that's fast. There are certain things in the medical area that we can knock off petitions very rapidly. Sometimes -- well, I know there's a fellow in my branch who has responded to a petition and the final decision was made, and so forth, and the regulations changed, within a matter of a couple months. But that's an unusual circumstance.

Q Well, why does it take so long?

A Generally, the problems are not simple ones, and there's a great deal of controversy involved, so one has to be very careful to do the best job possible to gather all the data and write up all the material properly. And then there's a -- just the process of getting concurrence, office concurrences, among all the offices and all of the comments included -- and also just the process -- the petition comes in, it's received, it has to be announced in the Federal Register, there have to be comments on it, and a whole series of things that do take time, in themselves, outside of the technical considerations, and they go to the Commission.

The Commission takes some time making decisions in these areas, and so it's not just -- it's not all the fault of the technical people, but there's a good portion of that time is involved in the technical evaluation.

Q After the Commission gets hold of a petition, do

they either recommend that it be denied, or do they recommend that there will be a hearing, or do they have a third or fourth option in there too?

A I don't know. The options I know is that they can take the staff recommendation. I know the Commission has the option of either recommending that a hearing be held, or recommending that no hearing is necessary.

Q When you say, take the staff recommendation, do you mean simply confirm the recommendation, and it then becomes a regulation?

A Oh, no -- well, if -- that I don't know, quite frankly. I don't know the answer to that.

Q During the period when the staff is considering the petition, or the rulemaking procedure, at any rate, and prior to the submission of the staff recommendations to the Commission, there are, as you've indicated, some opportunity for public comment, is that accurate?

A Yes.

Q Okay, are there public hearings held during that span of time, as a matter of course, do you know?

A No, I don't.

Q Okay. After the Commission has decided on -- concerning a petition, to have a hearing, is the hearing always an adjudicatory hearing, with witnesses, cross-examination, judges, testimony under oath?

A No, I don't believe there are judges. I believe it's before a panel of the Commission.

Q Is there testimony under oath, for example?

A Yes.

Q And there's cross-examination of witnesses?

A ~~Mm-hmm.~~ yes

Q And how does the result of the hearing play into the final decision-making, with respect to the regulation?

A I don't know.

Q You don't know if the result of the hearing mandates that that becomes the regulation, or whether that simply --

A The decision is made by the Board, and I don't know how that fits into becoming a final rule.

Q Okay. Do you have a sense for how long it takes between a Commission recommendation for further proceedings -- a hearing or whatever, and the time that a proposal actually takes the form of a regulation and becomes effective?

A No, I don't.

Q Okay. After the hearing stage, do you know if there's any other steps that are taken procedurally with respect to --

A I know there are some -- probably, room for appeal of a decision, and after that I don't know.

Q Okay. After the hearing stage begins, is your

office still involved?

A Oh, yes. Very often, we're -- we would be involved in giving testimony. If we had input into the staff position, then we would probably provide witnesses at the hearing.

Q I see. Okay, let's focus for a moment on how your office makes a recommendation to the Commission with respect to a regulation, if we can speak in this -- somewhat in the abstract. If a petition would come in, and recommend a change in one of the permissible radiation levels that you have in 10 CFR Part 20, what steps would this office take in analyzing that recommendation, and how would it reach its conclusion with respect to it? I know that's a big question.

A There are two ways -- two important aspects of most petitions. One is the scientific validity, the basis on which the recommendations are made -- the petition, and the other is, given that even those bases were correct, how would this impact the regulatory strategy of the Agency?

For instance, if the petition requests that the occupational ~~gross~~ dose limit be lowered on sound scientific grounds -- the grounds may not be sound from the standpoint of regulation, because of the way the industry operates. For instance, if the occupational exposure level is not too low, then we may get a higher population ~~gross~~ dose, because of the

actual procedures in doing maintenance jobs. If the occupational dose limit is too low, then the time that an employee can go in to do a job is more restrictive, and those parts of the job that require setup now take a larger amount, proportionately, of the time for him to do his work.

Q What do you mean by setup?

A In other words, a fellow has to go in and find a valve, okay --

Q Okay.

A -- attach a wrench -- he's not doing anything, you know, productive now, with respect to what he has to do. Then he turns the valve. When he's turning that valve, that's the actual work. But all of that preliminary time, you see, takes up a larger proportion of his available time to do that work, if the dose limits are too low. So we have to move a lot more people in there --

Q All right.

A -- with a lot more unusable time, or more unproductive time. So it may be very well to say that, yes, we should lower the occupational dose limits for this reason -- but by taking a look at the actual effect of this on total dose, it may be quite the opposite.

Q I see, so you're saying that if you would require more people to do a job where there was a setup time, because of a lower dose, then you'd have a greater number of people

getting a lower dose?

A Yeah.

Q Than you are with the higher --

A That's right. And you may actually increase the total dose to the population, the worker population, and so we have, on the one hand, yes, it looks like, from a scientific point of view, that we should lower the dose limit. But from the practical standpoint, it may do just the opposite of what it was intended -- I'm not saying that that's actually what happens, but these are the kinds of considerations that are made.

So, from a technical standpoint, we may come up with one conclusion, and then we have to weigh that conclusion against what actually goes on out in the industry.

Q Well, when you reach an occupational or a public dose permissible level, what do you mean when you reach that number? What's the significance of that number that you come out with?

A Well, that's a -- the level is actually a guide. We practice as low as reasonably achievable. What we try to do is get the smallest dose possible from any of the operations of the industry. The dose limit is strictly that -- the dose limit. In other words, we do not permit exposure of employees to exceed that limit. What we try to do is get them as far below that limit as we reasonably possibly can.

Q By setting a limit, are you -- is the NRC stating that it -- to its best knowledge, exposures below this limit will have no adverse health effects?

A No. The Commission and the general view is that -- and prudent view is that any exposure to ionizing radiation can be harmful. So the objective, therefore, is to reduce the exposure as much as possible, within the state of the art or whatever. And therefore, the limit is set knowing that some small health effects are possible from exposure to the limit -- unmeasurable, in most c es. But the ALARA principle is applied, to reduce exposures as far below that as practical.

THE REPORTER: What principle?

THE WITNESS: A-L-A-R-A. As low as reasonably achievable.

BY MR. PEARSON:

Q Is the NRC of the view that there's a linear relationship between health effects and exposure?

A That's what we practice.

Q That's what you practice? Okay. If that were the case -- getting back to the example that you just mentioned, with respect to the total cumulative dose to persons, if you had a lower occupational, permissible dose, in the regulations --

A Okay.

Q Would that example that you just gave, which might result in the Commission recommending a higher occupational dose level, in your mind conflict with the operating principle that the exposure to radiation has a linear effect with respect to the --

A I'm not sure that I --

Q Do you follow the question?

A I'm not sure that I advocated a higher occupational exposure level.

Q Okay. I didn't mean to imply that.

A Okay. But what we might recommend is not lowering the limit.

Q Okay. My question is, would that recommendation -- once again we're speaking in the hypothetical --

A Okay.

Q Would that recommendation conflict with the operating principle that there's a linear relationship between radiation exposure and public -- or adverse health benefits?

A No, no, it wouldn't, for the simple reason that the lower the amount of radiation that you can have -- occupational, or the general population exposed to, must give you benefit. Now, the as low as reasonably achievable is also based on how fast can a -- and how efficiently can the jobs be done, within the industry.

So if you can find a way to do the job faster and

better, right -- have the people in there doing the job more efficiently, for less period of time -- less exposure time, that's the kind of thing that ALARA points to.

Q Okay.

A And we would encourage this. It's in the regulation.

Q Okay. In 10 CFR Part 20, you have certain limits established. Does the ALARA concept work in supplement to those limits?

A Actually, the ALARA concept should come before those limits.

Q Well, what if the ALARA concept would result in exposures of persons above what the limits in 10 CFR 20 would indicate? Would that logically occur?

A No.

Q And why would that not logically occur?

A The limits are individual limits. There are no population limits in 10 CFR Part 20. The type of discussion we've had talked about an effect that the job -- it took on a large number of people in collective doses. And as of right now, 10 CFR Part 20 speaks to individual doses. So one would not have a procedure that would give, let's say, a maintenance employee greater than a 1-1/4 REM per quarter, you see -- when he got to his 1-1/4 REM per quarter, he'd be pulled from that job, or the overexposure would

be reported.

Q Okay. He would compute that 1-1/4 REM figure, or whatever the figures are -- you would take into account the operating procedures on site as part of your decision making?

A Those are mostly Alexander's types of considerations.

Q Okay.

A Occupational Standards Branch -- but generally, the doses are not computed. They're measured, in other words, by a film badge, or a thermoluminescent dosimeter, or some other way. Occasionally, where there's, let's say, an airborne exposure, one has to fall back upon the recording measuring devices within the plant, and then back-calculate to see what kind of exposure the employee might have gotten. But this is rare.

It's most apt to be a situation where, if the measurements can be read off of some sort of --

Q Okay, all right. So, getting back to the question of deciding on staff recommendations, with respect to a rule-making, what other factors do you take into account during your considerations? You take into account the scientific data, of course, with respect to the effects of low-level radiation?

A Yes, that's what the technical staff does.

Q Okay.

A And knowledge of procedure and so forth -- the actual application in the industry.

Q Okay -- the work procedures.

A That's right. That's Alexander -- that would be the Occupational Health Standards Branch.

Q Okay.

A Our branch just usually calculates the effects of exposure.

Q Okay, would other branches insert other considerations into the rulemaking -- decision-making process?

A Outside of strictly general consideration of technical expertise, I don't know.

Q Would -- in reaching a phantom level recommendation, would the staff take into account the economics of the industry?

A Oh, yeah, that's part of it. Part of it is economics. But I consider that to be a technical --

Q I see. And who would actually be concerned with the economic impact of a change in the regulations? Which organ within NRC would do that?

A I don't know the branch that's involved, but there are people within NRC who do those sorts of things -- economic impacts.

Q Okay. They would always consider the technical

feasibility? I guess that's -- that would be part of it too, I would guess.

A Technical feasibility of what?

Q Technical feasibility of the industry, in limiting exposures to a certain level?

A Yes, that's another consideration. We have to look to see if there are -- there is equipment out there to do the job.

Q Do you have a sense for how these various factors are balanced, with respect to formulating a final recommendation to the Commission?

A No.

Q Is there any policy statements on that?

A I'm not aware of any. I'm not familiar with any. When you say, am I aware of how they're balanced --

Q Right.

A -- I gave you an example before, one of the types of balancing that's done.

Q Right.

A That's what I'm familiar with, that kind of consideration.

Q Okay. But you wouldn't know if -- for example, if the economics would be very expensive -- whether that would constitute a veto on the -- on, say, low-level limitation, or would that simply be another factor that would be

taken into consideration -- which are given greater weight in the decision-making process? That's the kind of thing I'm looking for.

A Oh. Well, with respect to exposure of the general population, Appendix I of 10 CFR Part 50 gives a number -- a valuation per unit of exposure, $1,000 per man-REM. If the dose to the population, in the design stages, can be calculated to be reduced by an increment, which is less than $1,000 per man-REM, then it's recommended that that particular -- is required, actually, that that particular piece of equipment, or whatever, be installed in the plant.

So there, there is a number. Let's say that a piece of equipment cost $2 million, and would reduce the exposure -- population exposure by 20 man-REM. Twenty man-REM times 1,000 -- that's $20,000 -- they would not put in that piece of equipment, to reduce the population exposure.

If, on the other hand, you reduced it to 1,000 man-REM for a $100,000 investment, boy, that piece of equipment goes in, all right. It's a two-way sword. If -- in the design stage, a plan comes in, and it's seen that there's a piece of equipment that doesn't -- that is not economically effective in reducing the doses in there, the option is for the applicant to take that out. So it can work both ways.

On the other hand, there is no number -- $1,000

per man-REM or something like that, that is applied for occupational exposure. So the economics -- you haven't got some handy-dandy guide to work against, and it's a little more complicated.

Q So in some cases, an existing piece of equipment in terms of dose reduction that could limit exposure, if it's uneconomical, could be removed, and another piece of equipment that would be economical, would be ordered to be --

A Yes, placed -- only in the design stage.

Q The design stage of the entire --

A Yes, when a facility -- when an application comes in, like for a construction permit, and during the construction permit stage, there's nothing built -- it's all designed and laid out for the staff. The staff and the applicant both make analyses -- the staff makes its own independent analysis, and based on the actual radioactive releases calculated, that is to say, calculated radioactive releases, the types of equipment that are recommended, the distribution of the population around the proposed plant and so forth -- doses are calculated.

And if it's found that the doses calculated do not meet the specific dose design objectives in Appendix I, then something has to be added to the plant, to correct the calculated releases. Sometimes it's very difficult for the plant to meet that kind of release.

One particular and most limiting radionuclide is iodine, and there are times when it's rather difficult for the plant, without an enormous expense, of millions, in filters, and so forth, to reduce its iodine, to meet the Appendix I objectives. But they have to meet those objectives, regardless of the cost of the piece of equipment.

Now, if the total population dose, after meeting the dose design objectives of the 10 CFR Part 20, are met, it would be very unusual that they didn't meet the -- that any more equipment would be economically feasible, to reduce the total population dose. It would be hard for me to envision anything different than that.

Q But if some piece of retrofitted equipment would be economical, to reduce the population dose, would the NRC require that retrofitting?

A If the dose design objectives -- that is to say the individual dose design objectives, are met, it's my belief that NRC would not require any further equipment.

nd 1

Q How are those design objectives determined for any particular commercial plant?

A They are in the regulations.

Q Okay.

A But those design objectives are in the regulations.

Q And that's 10 CFR, 20?

A No. That's 50.

Q That's 50?

A Yes.

Q Okay. Now, what if those objectives would be changed after a plant was constructed? Would those changes ever be retroactive to an existing facility?

A I think we can look at that with what has gone on with Appendix I of 10 CFR, Part 50, as they exist now. All of the plants are being retrofitted or have been retrofitted to meet the new 10 CFR.

Q Okay.

A Because now, the technical specifications for operation are based on Appendix I of those design objectives now. So the effluent releases must meet those guidelines now.

Q Okay. In 10 CFR Part 20, there are, as I recall, standards for permissible exposures within restricted areas and unrestricted areas. Is that accurate?

A Yes.

Q Okay. Could you speak to what those exposure levels

are, say, initially, in restricted areas?

A. I can't. I don't know enough about them to -- about the numbers, and so forth.

Q. Okay. Am I accurate in thinking that the exposure levels for restricted areas are different than for unrestricted areas?

A. Yes.

Q. Okay. Why would that be?

A. I could only give you speculation because it's more apt that members of the general population would be in the unrestricted areas, the non -- those persons who would not be considered to be employees of the licensees would be more apt to be in those locations or probably only allowed to be in them.

Restricted areas are those areas where actual operations are going on where persons who are actively employed in that kind of business are present.

Q. Is it generally true that under the existing NRC regulations, persons in restricted areas are permitted to receive a higher radiation dose than persons in unrestricted areas?

A. That's my impression. Yes.

Q. Okay. Do you know why that decision was made?

A. I don't.

Q. You also have different standards with respect to

radiation and radioactive materials. Is that accurate?

A I'm not sure.

Q Okay. We will just proceed. For persons who are exposed to radiation, you've indicated that there's a certain quota or exposure rate that is permissible.

A Yes.

Q Can you speak to how the accumulation of exposure is trapped over time to assure that particular employees or that the public sector does not receive exposures in excess of the limits?

A I gave you my understanding of that.

Q Okay.

A Mr. Alexander, that's his bag.

Q Okay. The licensee is required to report over-exposures to the Commission as well as total occupational exposure for a facility at the termination of employment of the person at that facility. At that time, those doses are reported to the Commission.

The total occupational dose -- that is to say, if the person has been on more than one job -- can be reconstructed from the termination reports that we receive here. Because, as a person tracks through industry, unless he changes his name, or things like that, or tries some devious things, can be summed here because each time he ends his tenure of work at a particular plant, that report is made to the NRC.

He may go into another plant at the termination of that. And so we have a number of termination reports on particular individuals. And I believe that's how we keep the sums of the total exposures.

The other information is kept by the licensee, which is inspectable. That information is inspectable by NRC personnel, but does not have to be recorded, by regulation.

Q When you are considering standards, you interrelate with the Environmental Protection Agency in their work in this regard?

A They write the overall environmental standards. In other words, when 40 CFR 190 goes into effect, then we will be bound by that.

Q What will 40 CFR 190 do?

A That sets the permissible population exposure to radiation. I believe it's 25 millirem per year total body and 75, millirem to the thyroid -- something like that. And, therefore, NRC will have to set its business so it does not exceed 40 CFR 190 levels.

Q Okay. Do you know when 40 CFR 190 is scheduled to come into effect?

A I believe it's December of this year. I'm not sure. I think it's December.

Q Will the NRC regulations have to be tightened to meet EPA 40 CFR 190 standards or loosened, or what?

A I don't believe they will have to be tightened.

I think we're pretty well within them now. There's a possibility for multiple unit sites that there may be a limit imposed by 40 CFR 190. But I don't know how it's going to be done.

Most sites that I know about can make that right now.

Q When you're considering any petition for rulemaking or any rulemaking generated from any initiative, is EPA routinely notified and does EPA normally participate in that rulemaking?

A I can only tell you my only experience in this regard. Back to the NRDC petition again, it's very likely that there will be joint EPA/NRC hearings in that area. I know that NRDC petitioned both EPA and NRC in the same area. And it turns out that EPA initially denied the petition.

And then, I believe that they've reopened it; reopened consideration. And that's part of why the hearing is being held. If EPA doesn't act fast enough, I imagine that the Commission will go ahead with the --

Q Is it your normal procedure, when you receive petitions for rulemaking changes, that you notify EPA and other Federal agencies of that receipt and invite their participation?

A I don't know. I'm not in that line.

Q Okay. Have you -- do you normally contact the

Occupational Safety and Health Administration when rulemakings come in involving workers?

A I don't know. I believe they might also be a party to this joint hearing too. But I don't know what the normal procedure is for contacting them.

Q Would you know of any normal procedures of the same sort involving NIOSH, N-I-O-S-H, the National Institute of Occupational Safety and Health?

A Not with petitions. We work with NIOSH in other ways. One specific way is with respect to Three-Mile Island. Secretary Califano requested assistance in getting worker exposure data at Three-Mile Island and ~~route~~ wrote to Chairman Hendrie in this regard.

And Mr. Purple was appointed as the coordinator of that, Mr. Bob Purple who is my boss. I worked with him closely on this. And we had that with NIOSH and we have supplied them with information and material.

Q Well, we will get to that in some greater detail in a minute or so. Do you work with fashioning any standards other than standards with respect to permissible radiation levels?

A Yes.

Q What other kinds of standards do you work in --

A Well, standards with respect to the medical applications --

Q Okay.

A -- of radioactive materials.

Q You mentioned --

A Some of these relate to such things as medical misadministrations. Do physicians who, for one reason or the other, who are -- let's start that over again.

If there is an incorrect application of a radioisotope during diagnosis ~~for~~ or treatment, how is that managed? How should the NRC be notified? Should the NRC be notified? At what level of mismanagement should that report be made, if at all? These kinds of things are considered.

In the general license to use readioactive materials in diagnostic kits, should veterinarians be allowed to be part of the general license rather than operating under specific licenses, these sorts of things. If our inspection and enforcement people find something out in the industry on control of radioactive materials in plant were requested to help out to write a new rule to take care of that situation.

As a matter of fact, we're involved in something like that.

Q Okay. But what do you mean if they find out something involving --

A In other words, there's a way in which radioactive materials can be stored under lock and key outside of the control area of a nuclear power plant. However, the controls

inside -- you remember not too long ago, some uranium got out of a facility; I've forgotten. Some fuel material was just taken out and the people found it in a field.

Our I&E people said the regulations don't provide for things like that. We're working on how to control those now inside the restricted areas. So we're writing a regulation now to tighten up on the handling of materials.

Q How would you go about making decisions with respect to regulations of that sort?

A Well, you make decisions on controlled access. Or if one looks at a whole variety of different types of decisions that could be made, do you control the access, do you lock the materials up, I mean, a whole bunch of things. And then -- or a series of decisions.

And then one recommends, via a series of elimination or discussion considerations, which is the best choice to make --

Q Is it a common sense kind of determination?

A Yes.

Q Do you have any criteria, guidelines, regulations or other documents that would guide decisionmaking of that sort?

A This one, no. That kind of -- this particular situation, no. Generally, if we came up with a decision, certainly if we came up with a decision on this, we would send

it over to Inspection and Enforcement. And if they thought we were way off base, they would make their recommendations and say, we think it ought to be this way, because they're the people who really know about what is the most effective way to handle it.

Q I see. Maybe I'm incorrect here. Did you indicate that when you're fashioning a new radiation level standard, you have no criteria guidelines or other documents to really direct your decisionmaking there also?

A I think I mentioned that we just handle it from a technical standpoint. If there are technical considerations in effect, then that's our consideration that goes in the paper that goes to the Commission for their decision. We don't make the decision on that. We make the recommendations along those lines.

Q Okay. You make a recommendation based on the health effects, I guess. Okay?

A Yes.

Q Another office -- you tell me if I'm wrong here -- another office would make a recommendation perhaps based on the inspection and enforcement impacts of a particular change.

A No. Not necessarily. What happens is that the recommendation that's made comes up from all the offices. So all of these things have to be taken care of, resolved before the final recommendation goes to the Commission.

Q Okay. Who resolves all those?

A Well, it's a matter of just talking with one another and going round and round until a resolution is made from office to office.

Q So there's no single person below the Commission level who could resolve the differences of opinion among the different NRC offices and come up with one coordinated recommendation for the Commission?

A That's correct. If there are a number of technical recommendations which are opposite in effect or which conflict, those conflicts have to be ironed out before the recommendation goes out.

Q What happens if those conflicts are irresolvable?

A I don't know. I've never seen a situation when they weren't.

Q Have there ever been dissenting recommendations made to the Commission?

A Oh, yes.

Q I assume if there's a dissenting recommendation made to the Commission, that indicates that there was some sort of a conflict that could not be resolved at staff level?

A I see where you're going.

Q All right?

A Yes.

Q How is it decided whether to continue working to

resolve or whether to submit with a dissent to the Commission? How do you end the process?

A I don't know. I don't know when to end the process. But if I were making those kinds of decisions, at some point, it would become obvious that if there is a technical disagreement, at some point, that we'd get to a -- say, well, I'm not going to change from here, and that's as far as we go -- that would be the dissenting point of view. We couldn't go any further than that.

Q Okay. When something is presented to the Commission, is it presented by means of an oral presentation as well as a written submission, or is it simply a written submission, or how is that --

A In my understanding, it's both.

Q It's both?

A Both, first written, and then the Commission has time to digest it, and then there is an oral presentation by the staff.

Q Okay. Is the oral -- who usually conducts the oral presentation? Do you? Is there --

A In my experience, generally it's the individual who had major responsibility for coordinating the response. For an NRDC petition, it would be Bob Alexander. I believe he gave a presentation to the Commission on that.

Q All right, okay. Do you have personal involvement

with the present 10 CFR Part 20 standards? Were you involved with the proposal and promulgation of these standards that are now in effect?

A No.

Q For how long have these standards been in effect?

A A number of years.

Q Can you be at all specific?

A No -- well, they were in effect when I got here in '72. They were in effect before that. My guess is probably somewhere around 20 years. I'm not sure of the exact number of years, but there's -- a long time.

Q Okay. Have there, to your knowledge, been many petitions to change Part 20 standards since they have become effective?

A I imagine there have been quite a few. I'm only familiar with three or four, maybe up to five of them. But I'm sure there are a lot more. That is -- well, I know there have been plenty in the medical area, all right -- the three or four or five have been in the reactor area, applicable to nuclear power --

Q Nuclear power --

A Power generation. I know there have to be a tremendous amount. Waste disposal is part of it. I know there are petitions on waste disposal. Dose limits -- I know there are, with those. Medical -- I know there are a

lot of them there. A whole bunch of petitions.

Q Do you have familiarity with any of these petitions -- firsthand knowledge?

A Yes, I've had -- I've made technical input to several of them.

Q Could you tell us about those?

A One in particular was a petition by, I believe, Honicker, and this was a petition to shut down the nuclear industry, all nuclear power reactors.

Q When was this petition received?

A I believe it was last year, '78. And I was involved in writing some of the technical analysis, in response to contentions, on that petition, and testified -- almost -- never quite got to testify in court. The case happened to be thrown out. They came to the wrong court.

NRR was responsible -- had the basic responsibility for that petition. I have had technical input to the NRDC petition.

Q Let me interrupt you -- what was your technical input for the --

A Oh, answering questions on radiological health effects, analyzing some of the arguments made by the petitioner, and responding to them, and also being available to give testimony.

Q Did you just state that the nuclear industry was

compelled to meet the radiological health standards? Your testimony went beyond that?

A What we did was, where a piece of research in the field was analyzed or used as a -- used for a conclusion, the basis for a conclusion, we went back to the original material, and actually examined what the researcher said. And in some instances, we found that there was distortion in the way the material was presented. We also brought in other evidence, other material, research material, that applied to the same situation, and came up with conclusions on the individual contentions. We didn't -- as part of the technical analysis. We didn't make any decision on whether or not -- or the petition should be denied. We just looked at the technical aspects.

Q Okay. You were just mentioning the NRDC --

A NRDC. The NRDC mentioned some recent research that we at NRC had already analyzed, and so we included a response to the presentation at NRDC in the petition. We were responsible for that. That was both Mancuso, Stewart and Kneale's work, and Irwin ~~Bose~~ Brose's work. We had responses -- and they're included as an appendix to the petition -- a response.

Q Okay. Would it be possible for us to simply review the files for those petitions in those proceedings? Would it be a problem at all?

A Copies of the recommendations --

Q Okay. Were there other petitions?

A I can't recall the names of them.

Q Okay. When you've fashioned standards, with respect to radiation --permissible radiation levels, is it fair to say that the primary information which you consider is available scientific analysis of the health effects of ionizing radiation? Is that a --

A No, I don't fashion the standards -- okay.

Q Who in the office does?

A Starting from there -- would you repeat that?

Q Okay. Let me rephrase the whole question.

A Okay.

Q I know that what your office does is analyze the radiological health effects, okay, of ionizing radiation, and you come up with standards, okay, which you would recommend, and they would go through the entire rulemaking process, okay -- you would recommend some level?

A Okay.

Q Okay, fine. When your particular office is reaching its own recommendation, before it gets tossed into the pot with other people's inputs, as it were, do you exclusively consider, on the scientific side, studies that persons other than NRC employees have made? Or do you also commission studies of your own, with respect to ionizing radiation and its effects?

A We have a limited capability to fund research. We can fund to a limited extent what we call technical assistance, and that can be funded -- those sorts of things can be funded by individual offices within NRC, without going through research.

For instance, the type of thing that we can do -- and that is to say, let's issue a contract to do a literature search, to come up with the best concentration factors for radioactive materials in water, so that we can use those materials in our calculational models. Or if there are data on effects, let's put out a contract to have those data reanalyzed independently, to see if we get the same results as other researchers in this area.

We have done that with the Mancuso-Stewart-Kneale data at Hanford -- those kinds of things we can do. Basic research, on the other hand, where laboratory -- glassware research, is generally not within the scope of the types of things that NRC does. The Office of Research has a much broader area. If a particular type of research cannot be funded within an office, then it's requested that Research fund it, and they go out and contract it, and they follow those contracts through.

So it's quite possible that we can do a small amount of research, with respect to some of the technical decisions that we make. Most often, however, we count on

research by -- and analyses by groups outside of NRC, whether it be DOE, or research funded by universities, or done at universities, funded by other people, or other governments, for that matter -- summaries of research that are presented in international documents by the ICRP, and so forth.

Q You mentioned the use of models. Could you just give us a general feeling of -- what do you mean by that?

A Oh, sure, certainly. If we have radiation released into the environment, we would like to be able to calculate how that material gets to man, and what the exposure to man would be. So one can measure directly -- what one would like to be able to compute, based on a release, what a man sitting downstream might get, and that's a mathematical calculation -- and the parameters that go into this, and that calculational technique is a model.

Q So the model is simply the method by which you compute the --

A It's a mathematical description of the real world.

Q Okay, okay. When you're originally taking into account scientific data and other information that would generate your recommendation, would you use a model in that step of the -- of your analysis, or would the model follow that? Do you follow me?

A In my line of business, what I would see is a recommendation from -- or a piece of information in a document

that says, one could get so many health effects per unit of exposure. They have already modeled to get that.

Q Okay.

A I'd take the end result of that.

Q Do you have any standards with respect to transporting materials to and from plants? Do you work with standards --

A No, that's not my branch.

Q Okay. Have you ever considered any standards with respect to the availability of potassium iodide, or anything like that?

A Not standards. I'm actively involved right now in responses and considerations of the use of potassium iodide as a prophylactic for thyroid exposure. We have received letters both from the Congress and from our Commissioners asking us about -- asking us to review certain documents that ~~oppose~~ propose this material, asking us whether or not we agree with this, whether we have recommendations on the use of potassium iodide, and within a week or two we should have the response of the Commission, on an office level, that is to say, a joint office analysis of this situation.

Q When were these requests made?

A I guess they came in over the last three months.

Q Is it your understanding that these requests were generated by the Three Mile Island incident?

A Yes.

Q Okay. Have you had any other requests generated by the Three Mile Island incident that --

A Oh, we have numerous -- numerous requests, letters from the public, asking such things as, is it safe for us to drive through Three Mile Island, or requests from Congressmen saying, I have two of my constituents who work at Three Mile Island, and have gotten these doses -- what's the chance they've developed cancer? Those kinds of things.

We have a host of physicians and industrial organizations writing us, saying, I have this neat test for determining the effects of radiation -- shouldn't we look at all the people around Three Mile Island? Things like that -- a whole raft, a variety, of materials like that.

Q Are you reconsidering any of your permissible radiation levels as a result of Three Mile Island?

A No.

Q Have you received any requests to do that?

A I haven't seen any, but I imagine there have -- or will be.

Q Okay. Are there any studies that have been undertaken with respect to any of these areas, to your knowledge, since Three Mile Island?

A Well, there are studies that have been undertaken by the State of Pennsylvania, and some studies by the

Federal -- by Federal agencies.

Q Anybody at NRC?

A Yes. There, I believe, is an attitude survey going on with people around Three Mile Island, but I'm not much more familiar with it than that.

Q Okay. You indicated you were Project Manager for a radiation -- epidemiological study.

A Yes.

Q Could you tell us about that?

A The Congress directed NRC to perform a feasibility study. The aim of this was to determine if there are populations which are suitable for follow-up epidemiological studies -- effects.

Q When did Congress direct you to do this?

A The -- we knew that this was coming, in, like, October or November of 1978. The actual law was signed, I think, somewhere around November -- November 6, about the turn of the year -- and we had started working on this before that time, in anticipation.

Q Okay.

A The contract has been issued, by the way. And we should have a report to Congress on progress of the contract and preliminary results at the end of September.

Q Okay. What is the goal of the study again?

A The goal of the study is to find out if there are

-- well, what the best populations to study, from the standpoint of low-level radiation effects, are, what -- if there are no optimal populations to study, to recommend what data are needed, what steps should be taken, what kinds of things can be done to get the numbers for Congress, to give Congress a feel for the costs necessary for doing these studies, and the time that it might take to do them -- to let Congress make a well-based judgment on what they want to do in this area, how they want to continue.

Q So this study is to inform Congress of what it will have to do, and how much it will have to spend, and how much effort it will take, if Congress really wants to explore the area of health effects of --

A If Congress wants to get an answer on the dose response -- how many REM it takes to cause so many effects, you know, within certain bounds.

Q What do you mean, within certain bounds?

A In other words, let's say, you want to be 50 percent sure that your number's right --

Q Oh, I see.

A -- or do you want to be 95 percent sure that your number's right? Those kinds of considerations.

Q Okay. Well, in the past, when the standards of 10 CFR Part 20 have been drafted, what degree of certainty is tagged to those?

A I don't know what those are.

Q Okay. Do you know with whom I could speak with respect to drafting these actual standards now in place?

A I have a man in my branch who is really good in this regard.

Q What is --

A His name is Baker, Robert Baker.

Q And you say really good --

A Yes, he's been involved -- he's an old-timer, and he knows how these things were developed, what went into them. He was involved in the Appendix I considerations -- very sharp.

Q Okay, that's good to know. Now, in addition to this study that Congress mandated, does the NRC have any other ongoing studies with respect to the health effects of ionizing radiation?

A Yes. We reported to Congress on the means and capabilities of EPA and NRC in the area of low-level health effects. Also, within that document, was a compilation of the studies being carried out by NRC in the various offices with respect to these -- so you might want a copy of that, if you don't already have one.

Q Oh, yeah. I would like a copy of that.

A Okay.

Q Can you just estimate the number of studies

ongoing at the present time?

A I can't even give you a guess, you know, with any degree of accuracy.

Q Okay. Let me focus for awhile on your actual involvement or knowledge of the NRC's reactions to the Three Mile Island accident. When did you first find out that there was a problem at Three Mile Island?

A Back in March. Well, we found out that something was going on in the first week, but we had virtually no information of the extent other than, you know, what we started hearing and reading. We had no -- there were no documents, no papers, no reports that came to this office, at least to my branch, in the first week. We knew very little, officially, about what was going on.

Q Okay, the action commenced on a Wednesday, so when you say the first week, do you mean through the following Wednesday, or do you mean --

A As a matter of fact, it was a number of weeks before we started getting regular communications -- descriptions of what was going on. And Baker, actually, had called up and said, isn't there anything available for us to look at? Where is the material? So finally we started getting information.

Q Well, how did you react to this --

A We were annoyed.

Q You would have expected to receive information?

A Sure, we're the -- we're calculators. We're the people who would estimate the health effects.

Q Estimate the health effects of the releases?

A Sure. In other words, if there were some information to be gotten out of releases -- if there were some information on releases, I would have expected that to come to the branch, so that we could make some preliminary estimates on what the effects would be, in that area.

Q So you would have expected that once information became available as to the amount of radiation released, and to the off-site dose that that release would cause, that that information would be transferred to you, and you could then look at it very quickly, or take analysis, whatever --

A Yeah.

Q -- and determine what the health effects would be?

A Yeah.

Q Okay. And you heard nothing --

A Oh, it was quite some time before we started getting the individual incident reports or -- I've forgotten what those sheets were. They started coming -- we got our first ones, I think, in about two weeks.

Q Two weeks?

A But we had some information -- by getting on the phone, you know -- we had to actively go out and search out

information -- you know, get some feeling of what was going on.

Q Did you first hear of the accident through the media?

A I can't recall. I can't recall. My impression is that I walked into the office one day, and somebody says, hey, there's something going on in Pennsylvania -- a release. I said, what is it, and that was all the information that was available at that time.

Q Did you at that time make a telephone call to anyone else within the Agency or elsewhere to find out what was going on?

A No, no, because from time to time, we get information like this, and it's of no veracity. But we -- let's see, I can't recall when the first calls were made around, to find out what was going on, clearly. I do know that there was no briefing -- formal briefing, ever, within this office, as far as I know, to tell us where we were and what was going on.

Q Well, the action commenced on Wednesday, March 28, and I would imagine that the media, by Thursday morning at least, would have picked up on it quite a bit.

A Yes. Well, I'll tell you, by Friday of the week, we had, the epidemiologist and I, had developed what we thought might be a good plan for follow-up studies.

Q Okay, the week after that -- on Thursday, the second full day of the accident, did you contact anyone with respect to what was going on?

A I did not.

Q Did anyone in this office, other than Mr. -- you said Mr. Baker contacted somebody?

A Yeah, I don't know exactly when he did it.

Q Okay.

A But I personally didn't contact --

Q Okay, do you know if Mr. Purple did?

A No, I don't.

Q Okay. Did you at any time contact anyone with respect to the accident, and offer your services, or did anyone in this branch --

A Well, we started -- on Friday of that first week, when we started considering what kind of studies might be performed, on the population around Three Mile Island, we wrote a memo and got it into the system recommending these things be done.

Q Okay.

Q Did you at any time go over to the Incidence Response Center that had been set up by the NRC to manage the accident or at least keep in touch with it?

A No, no. I was never personally in the Incidence Response Center. With my later activities with respect to NIOSH/NRC activities, I was in contact with the Center but never went down there.

Q Have you ever learned subsequently or discussed with people subsequently why this office wasn't contacted during the accident?

A No.

Q What then was the first thing that this office did as a result of its knowledge of the accident?

A I don't know what the first -- the first step of the office. I know we did in the branch, describe that to you.

Q Okay. You said you would begin to consider the followup study.

A Yes. As a matter of fact, Bob Goldsmith who is the epidemiologist of my branch called some people he knew at Columbia University and asked what types of studies might be recommended. I understand that some of the staff and faculty of Columbia University met on Saturday, the first Saturday, and we had information from them on Monday.

Q They called in?

A They called in on Monday and talked to Bob and gave him some information, and we wrote the memo recommending that certain studies might be considered.

Q Do you know why Bob Goldsmith called Columbia?

A Oh, he's -- he's a graduate student at Columbia University in epidemiology, and he knew some of the faculty very well.

Q Do you know who he knows there?

A No, I don't.

Q Do you know who he called?

A I could find that out but there are some pretty high powered epidemiology -- at that time we didn't know what the doses were. So our recommendations were kind of far out, certain aspects.

Q Would you find out who he contacted and who considered it and who got back?

A Sure.

Q I would also like a copy of the memorandum that you put together recommending studies. There is no problem there. Can you characterize for us from your memory what kinds of studies you recommended?

A No. I can't give you all of them. I know that one was -- let me job this down first.

Q Go ahead.

A One of the studies involved -- it's called amniocentesis which is a study that can determine whether or not there is a birth defect or a genetic defect in the fetus. It's a pretty -- it can be a pretty traumatic type -- it's a needle -- and there is a possibility of injury. Albeit the rate of ill effects is low, it turns out that this was not a recommended study and in retrospect it shouldn't have been. But this -- because we didn't know what the doses were at the time, these were the kinds of things that could -- we envisioned could have been done.

Q I see. To whom did -- when did you send this memorandum?

A I think it went the week following the accident.

Q The initiation of the accident.

A Uh-huh.

Q And to whom did you send it?

A This went to I believe the office director, Mr. Minogue.

Q Do you know what happened to the memorandum after you sent it?

A Oh, yes. It was -- we -- there were some discussions and it was decided that it really wasn't the -- we also recommended that NRC provide some funds so that the studies could be initiated rapidly. It turns out that, for whatever

reason, whether the funds were available or they couldn't be gotten up, that this was not -- it wasn't our job, it wasn't NRC's job to go out and do the particular type of work.

Q So none of the recommendations was adopted?

A Not at that time. Subsequent to that time, the state has done them. The State of Pennsylvania has initiated pretty much what we had come up with early on.

Q Was there a written response to this memorandum prepared by anyone?

A No, no, we -- Bill called in and we talked it over. Bob Goldsmith and I were

Q Were there minutes of that meeting?

A No, I don't think so.

Q Do you have any of his personal notes of that meeting or if there is any documentation at all?

A I am sure there is no documentation.

Q When was that meeting held?

A I can't recall for sure; maybe the second week after the accident or something.

Q Do you recall who was in attendance?

A Probably Bob Goldsmith and myself and Mr. Minog and there may have been someone else.

Q What else did you or your branch do with respect to reacting to the accident?

A There were some meetings with -- early on among

various people within the branches to consider what kinds of tests should be done, what kinds of studies should be done. Mainly, as I remember what was discussed in these meetings, was you have to know what the people were exposed to before you decide what kind of tests you want to perform.

After that, various members of the branch traveled up to Three Mile Island to interact with both the state and other Federal agencies in discussions of followup studies. Bob Goldsmith and I met with people from NIH.

Q You went up to Three Mile Island?

A I was up there several times, mostly --

Q When was it you went up?

A Well, a month of two after. This was with respect to the NIOSH cooperation, picking up data for NIOSH. But there were meetings with -- there was at least one meeting with National Cancer Institute personnel and Department of Health, Education and Welfare people also discussing potential followup studies.

There were three of us -- three or four of us who represented NRC on a subcommittee to an HEW committee which was studying the effects of ionizing radiation in general. The subcommittee was chaired by Arthur Upton of the National Cancer Institutes and deliberations of that subcommittee concerned what followup studies should be done, what emphasis

should be placed on these followup studies: Should they be considered as studies to look at the effects of radiation or the studies to look at the effects of a possible and things like that? We met five or six or seven times with that committee.

Q "With" that committee, you said?

A Yes, with the subcommittee, and their recommendations were made to the parent committee chaired by Dr. Frederickson of the National Institutes of Health.

Q Let me clarify the parties here with respect to followup studies. First, you were suggesting some followup studies.

A Early on.

Q Okay, early on. Am I correct in thinking that the NRC abandoned that because the State of Pennsylvania and others decided to take up those kinds of studies?

A No. They were abandoned for reasons other than that. I think that the major reason is that that kind of research study is not done by NRC. We had full knowledge that other agencies, state and Federal, do those sorts of things that were involved and would be doing their own studies.

Q When you say "those sorts of things", you are speaking of studies like amniocentesis?

A That's right, yes, the things that we recommended,

the types of things that we recommended, and that more than likely the studies would be initiated. We felt some sense of urgency to get these things -- to get studies started because we thought that there may be some loss of information by people moving out of the area, getting the earliest results of the highest levels of exposure, that kind of thing. It didn't happen that way. The studies have been performed or are being performed.

Q Did NIOSH come up with specific followup study recommendations at about this same time?

A It was another week. No, let me take that back.

Q Okay.

A About the second week the state was involved pretty heavily and NIOSH and CDC were involved in recommending the kinds of things -- or in considering the kinds of things that should be done. Those studies weren't instituted until -- what is it, August now? -- June -- so there was some long period of time before any of the studies were initiated.

Q So NIOSH was one.

A Uh-huh; CDC.

Q What studies did NIOSH -- to the best of your recollections, what studies --

A Oh, I can't recall what NIOSH recommended. They had a protocol or recommended studies. CDC also had some

studies. You might check with Dr. Upton's subcommittee to get all of the -- those pieces of material. We knew the state was involved early on. They had a pretty ambitious program already under way for other purposes which was -- and that program was adapted to fit and extended to fit the Three Mile Island situation. Then of course a whole raft of people from the outside -- the University of Pittsburgh and EPRI --

Q What was that last one?

A E-P-R-I.

Q What is that?

A That's Electric Power Research Institute out in California. They are funding some studies with the state, providing funds for the state to do some work. We know that the National Institutes of Mental Health were involved in setting up studies. We know -- I think it's -- I believe it's the Department of Defense that was in doing some attitudinal studies. As a matter of fact, they wanted to go in with NRC on the same questionnaire, and the questionnaire arrived here and we were absolutely flabergasted at the kinds of questions that were being asked. We asked to be separated from -- you know, take the two scare things apart. That questionnaire's ridiculous.

Q Are you keeping track of the different studies that are going on?

A As to the results? Well, there are no results in yet. We know what studies are going on though. We will certainly know what the results of those studies will be. That is to say, we will be informed of what they will be. We have our ideas about what they'll reveal.

Q To your knowledge, is anybody at NRC being consulted with respect to the progress of these studies or asked advice on the progress of these studies?

A Not in the recent past, not with respect to my branch. Bob Goldsmith assisted in constructing the questionnaire that's being used or that has been used for the population census within five miles of the plant.

Q Whose is that?

A That's a -- that's a government -- I believe it's CDC is performing that. He's been contacted by the State of Pennsylvania several times since that time to -- and has met a couple of times to talk over the other studies. So we've bee involved in that regard.

Q What other kinds of involvements have you had with the Three Mile Island accident?

A Nothing other than the interaction with NIOSH on the worker ~~deaths.~~ doses

Q On the worker ~~deaths~~ doses. I don't think we talked about that too much.

end bg

A No. I introduced it some time back by saying that Secretary Califano wrote a letter to Chairman Hendrie --

Q Correct.

A -- requesting assistance, and that NRC provide NIOSH with dosimetry information on workers, with the idea in mind of establishing a worker registry to allow for future follow-up studies, and Mr. Purple, Mr. Robert Purple, was -- in Chairman Hendrie's response to Secretary Califano, he agreed that we would cooperate to the fullest extent, and assign Mr. Robert Purple as the coordinator.

Since that time, I have been responsible for the coordination of activities between NRC and NIOSH. We've had a meeting here at headquarters in this building, and had an individual from Three Mile Island -- he works for NRC, Office of Inspection and Enforcement, come down and give a presentation on the types of materials, the types of data, types of records, that are being kept on workers and contractors.

Q And who is that?

A His name is Kinneman, John Kinneman, K-I-N-N-E-M-A-N. He's with Region 1, NRC, Inspection and Enforcement. And Mr. Kinneman came in to give his presentation to NIOSH -- came in from Cincinnati, and locally. In addition, we have met with Met Ed and some of the representatives of their consultant firms.

THE REPORTER: What was that?

THE WITNESS: Met Ed, that's Metropolitan Edison. On site -- to find out what sort of materials are available, and the results of that meeting were also sent to NIOSH, as well as some of the data forms, and so forth -- the kinds of things that are being kept.

BY MR. PEARSON:

Q Okay, are there -- I assume the letter from Mr. Califano to Mr. Hendrie is available?

A Yeah.

Q We'll get a copy of that --

A Sure, and the response --

Q And the response, and were there any minutes or notes kept of the briefing by Mr. Kinneman?

A No. It was reported in -- just in a short way, in our weekly events. NRC has a weekly events publication -- it's in there. The meeting was on the 17th of last month, I believe --

Q Okay.

A -- 17th or 19th of last month.

Q If we could see that, that would be helpful.

A I'll see if I can dig it out. Generally, those things get thrown away.

Q And --

A Let me take some notes.

Q All right. If you have any follow-up documentation with respect to the -- to this study, and this worker registry --

A Yeah.

Q -- that would be also good.

A I think I can provide something on that.

Q What's the status of that effort right now?

A At that meeting, the -- the fellow at NIOSH was in charge, and his name was Frazier, Tod Frazier. And he's in the NIOSH office in Cincinnati -- said that they would consider the presentation of the material, and write us a letter -- contact us, as to what their recommendations would be, from the standpoint of material to be recorded, data to be collected, and so forth.

And it's been roughly a month now, and we haven't received it.

Q Were there any other studies or post-TMI involvement that we haven't discussed about yet, that you'd like to bring out?

A Nothing -- you mean, from the standpoint of health effects?

Q That's correct.

A No, there's nothing that I can think of. The potassium iodide study was brought up as a sequelae to Three Mile Island, but that was always there.

Q What do you mean, that was always there?

A In other words, the idea that potassium iodide could be used prophylactically, has always -- has been known for some time. The point is that great attention has been called to its use, and to establishment of a position within the Agency, because of Three Mile Island. It's nothing, new -- it's not new. No, I can't think of anything else.

Q Okay. Can you think of any other involvement that you may have had, at the time of the accident, which we have not yet spoken of?

A Not that I can recall.

Q Okay. Do you have any other comments to make with respect to the accident and the amount of involvement you did or did not have in it?

A Outside of the initial disappointment and frustration, after that first week and a half was over, we became actively involved in it. And I felt a lot more comfortable with the position of the Branch, and so forth, that we were having our say.

Q Mm-hmm.

A It also became quite clear that it wasn't unusual in retrospect to see that we hadn't gotten good information, because at that time, early on, nobody had good information, and there appeared to be general disorganization throughout whatever Agency one was interested in. And so it wasn't

unusual in that regard. The -- as time went on, we have taken a much more active part, and those things that we had recommended early on, the types of considerations, have been initiated, so that's -- we just hope that we haven't missed anything by not getting in there earlier.

Q Were you aware of the recommendations that were made at the time of the accident by NRC, with respect to evacuating the Three Mile Island vicinity?

A Only vaguely -- only vaguely. I have the impression, and I can certainly be wrong, that we were the first to recommend evacuation. And it was held off for a couple of days, and then it was taken off -- but I could be reversed. Maybe it was the State that recommended it. But I think that NRC did it.

Q Would you have liked to have played a role in recommendations of that sort?

A Yeah, I think so.

Q Do you think that you would have had a significant role to play in advising the decision-makers with respect to evacuation recommendations?

A I hope I would have. I don't know for sure.

Q Well, do you think the information you could have provided would have been of value?

A I think it would have been of great value.

Q Why?

A Because they wouldn't have evacuated. I would not have recommended it.

Q You would not have?

A Yeah, I didn't think the doses were high enough to call for that.

Q Well, one of the figures that was mentioned was a release of 1,200 millirems that had been measured, and was believed to be at the north gate, or at least at the boundary of the property.

A Well --

Q How would you have reacted to that kind of information?

A Well, the dosimetry information I finally got, was considerably lower than that. Now, if it looks -- if it looked like the population distribution and so forth, and wind direction, was such that there was considerable dose to be gotten, I would have recommended -- the dose would --

Q You would have recommended evacuation?

A Yes. But as it looked to me, I would not have recommended it. Once the -- once the largest dose is -- the largest releases probably were never measured. In other words, early on in the early hours of the accident, those things were never accurately known. The largest doses were past. And in my estimation -- that it was already too late for evacuation. If evacuation was to be made, the largest

dose had already been incurred. Evacuation was made on the basis of uncertainty in doses. I don't argue with that.

I thought that things were pretty well measured by the AHRAM system that was there -- the helicopters that came in and so forth. They were there fairly quickly. The follow-up studies with dosimeters and things -- that took some time before a response came in, helter-skelter, later on -- but I didn't think that the doses were -- potential doses were high enough to warrant 360-degree, five-mile evacuation of -- it was prudent, I wouldn't argue with that.

Q Well, let me ask you a hypothetical question.

A Mm-hmm.

Q If you were there, and the information came in that there was a release of 1,200 millirems from the plant, and you assumed that was an off-site reading --

A At the site boundary?

Q At the site boundary --

A I'd have to ask some questions.

Q Okay

A What is it, what material is it, what direction is it blowing in -- where is it going -- if it was uniform around the site, that kind of dose -- and if we're talking about a dose rate, in other words, 1,200 millirem per hour, or something like that, I would recommend somebody getting out.

If we're recommending -- if the dose is something

like, oh, a maximum of 50 or 60 millirem per hour, and the wind is blowing pretty fast -- getting it out of there, there's no large dose that's going to be gotten. Your 1,200 millirem per hour might seem high, if a person is there for 10 hours at that concentration, yes.

Q Mm-hmm.

A All right, but if it's going by fast, a person may get one or two millirem from that kind of dose rate. So there are lots of things to consider.

Q What if the only information you had was one reading in a slight northerly wind?

A One reading in a slight northerly wind, I might think twice about not thinking about it, or --

Q Okay. And if your information -- once again, this is a question -- hypothetically and after the fact, and I recognize all of that --

A How good is the dosimetry, has to be part of it. I have confidence that the dosimetry is fairly accurate, and we can track the path of the contamination, and if I have any feelings about evacuating anybody, it's going to be downwind, in the path of the cloud, rather than just taking an overall action.

Q And assuming you also want to know if it was a continuous release, or a simple puff?

A Mm-hmm.

Q And if it were continuous, what would your reaction be?

A It depends upon the rate.

Q Okay.

A How much is getting out -- what kinds of calculated dose can we have, what kinds of dose we have. If we're talking about a few millirem, no, I wouldn't evacuate. We might cause more trouble by evacuating.

Q What if the calculated rates were 100 millirem?

A 100 millirem per hour? 100 millirem to people -- real dose, or calculated dose, I'd recommend -- if it looks like that's what the rates are going to be, or that's what the doses are going to be -- I'd have to -- I'm not so sure now. If the total dose were 100 millirem, I'm not so sure. If it's 100 millirem per hour, and it looks like that's going to continue for a while -- are you looking for when I would recommend --

Q I just want a sense -- I understand --

A I haven't -- this is the first time I've thought about, quite frankly -- about whether or not I would recommend it -- evacuation. Maybe a lot of that is based on hindsight, of what the doses actually were, or, you know, were measured to be. Given a hot situation, I'm not so sure I --

Q Okay. Can you think of anything else you'd like

to speak about that we haven't covered?

Okay, well, I guess that concludes the deposition. Are we on the record? All right, number 2 would be the professional qualifications of the members of the Radiological Health Standards Branch. Number 3 -- what is this --

A That's position descriptions for the branch members.

Q Okay, position descriptions of those branch members. Number 4, the petition submitted by Mr. Honicker, H-O-N-I-C-K-E-R.

A It's Ms.

Q Ms. Honicker? Okay, number 5, the NIDC petition, number 6, the report to Congress --

A On needs and capabilities.

Q On needs and capabilities. Number 7, the identification of parties that Mr. Goldsmith contacted at Columbia University.

A And this is the copy of the memorandum that we wrote, number 8.

Q Okay, copy of memorandum that you wrote, with respect to recommending --

A Follow-up studies.

Q -- follow-up studies, all right. Number 9 is the letter from Mr. Califano to Mr. Hendrie, with respect to coordination with NIOSH. Number 10 is the response to that

letter. Number 11 is --

A Weekly news items.

Q Follow-up information with respect to the coordination with NIOSH, which may take the form of a weekly news item and nothing more, and number 12, any other documentation you have on that same subject.

(The documents referred to were marked for identification as Exhibits 2 through 12.)

(Whereupon, at 12:45 p.m., the deposition was recessed sine die.)

I have read the foregoing pages, 1 through 75, and they are a true and accurate record of my testimony therein recorded.

Michael A. Parsont

MICHAEL A. PARSONT

Subscribed and sworn to before me this_____day of_____1979.

_____

NOTARY PUBLIC

My Commission Expires:_____

REPORTER'S CERTIFICATE

DOCKET NUMBER:

CASE TITLE: DEPOSITION OF MICHAEL PARSONT

HEARING DATE: August 13, 1979

LOCATION: Rockville, Maryland

I hereby certify that the proceedings and evidence herein are contained fully and accurately in the notes taken by me at the hearing in the above case before the

PRESIDENT'S COMMISSION ON THE ACCIDENT AT THREE MILE ISLAND

and that this is a true and correct transcript of the same.

Date: August 14, 1979

Official Reporter
Acme Reporting Company, Inc.
1411 K Street, N.W.
Washington, D.C. 20005

Depo. Ex #1
Date 8-13-79

PROFESSIONAL QUALIFICATIONS

of

Dr. Michael A. Parsont

My name is Michael A. Parsont, I am Chief, of the Radiological Health Standards Branch in the Office of Standards Development of the U.S. Nuclear Regulatory Commission. I have served in this position since November 1978. In this capacity, I supervise and direct the activities of six staff professionals in areas concerning the determination of health risks and effect from exposure to ionizing radiation, radiation epidemiology and regulation of the use of medical devices and pharmaceuticals containing radioactivity. In addition I am responsible for developing radiological health standards and guides and for the evaluation and assessment of the radiobiological health impacts on the public from proposed and licensed facilities. Such efforts include the determination of relationships between low-level radiation exposure and health effects from direct radiation and radioactive materials emitted from planned or existing nuclear facilities and from the medical use of radioactive materials. I am also responsible for directing, coordinating and evaluating technical support research performed by national laboratories and industrial contractors to establish the bases for regulations, standards and guides. I serve as an advisor and coordinator in radiobiology for technical assistance contracts. I represent the NRC at international symposia, and other meetings in areas of radiological impact assessment.

From September 1972 until November 1978 I served as a radiobiologist and an environmental scientist on the staffs of the Office of Standards Development and Nuclear Reactor Regulation, respectively. In these positions I performed evaluations of the health effects of ionizing radiation; prepared the Radiological Assessment and Radiological Monitoring Sections of Environmental Impact Statements; and performed numerous studies related to the impact of NRC proposed and licensed facilities on the environment.

I received a B.S. in Public Health from the University of California at Los Angeles (1955), a M.S. in Radiology from Colorado State University (1962) and a Ph.D. in Radiation Biology from Colorado State University (1967). I completed additional undergraduate studies in genetics and endocrinology at the University of California, Berkeley and graduate studies in Sanitation Engineering and Public Health at the University of California at Berkeley and Los Angeles, respectively.

I have more than 13 years of professional experience in Public Health, Radiation Biology, Environmental Sciences, research evaluation and coordination and standards development. This experience was gained at the Alameda County Health Department, Alameda, California; Sandia Laboratories, Albuquerque, New Mexico (Aerospace Nuclear Safety); NUS Corporation, Rockville, Maryland (Environmental Studies); and the AEC-NRC.