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SAFETY & HEALTH

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

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WORK GROUP ON THE PIQUA ORGANIC
MODERATED REACTOR

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THURSDAY
JULY 8, 2010

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The Work Group convened in the Zurich Room of the Cincinnati Airport Marriott, 2395 Progress Drive, Hebron, Kentucky, at 8:30 a.m., John W. Poston, Chairman, presiding.

PRESENT:

JOHN W. POSTON, Chairman
R. WILLIAM FIELD, Member
PHILLIP SCHOFIELD, Member

ALSO PRESENT:

TED KATZ, Designated Federal Official
HANS BEHLING, SC&A*
RICHARD DECKER*
ROGER HALSEY, ORAU Team*
STU HINNEFELD, DCAS
KARIN JESSEN, ORAU Team*
JENNY LIN, HHS
JOHN MAURO, SC&A
JIM NETON, DCAS
GENE POTTER, ORAU Team*

*Participating via telephone

C-O-N-T-E-N-T-S

Call to Order	4
Instructions and Conflicts	4
Report by Dr. Neton	7
Discussion of Path Forward	83
Additional Comments of Working Group	107
Adjourn	118

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

(8:30 a.m.)

MR. KATZ: Good morning, everybody in the room and on the line, this is the Advisory Board on Radiation and Worker Health, the Piqua Work Group and we are just getting started here. We have an agenda. It's been posted on the Web, I believe, and everyone who is a participant has one. So we will begin with roll call. Please state whether you have a conflict as well as we go through roll call for agency-related personnel. So, beginning with Board members in the room, with the Chair.

CHAIRMAN POSTON: John Poston, Chair, no conflicts.

MEMBER SCHOFIELD: Phil Schofield, Board member, no conflicts.

MEMBER FIELD: Bill Field, Board member, no conflicts.

MR. KATZ: And do we have any Board members attending on the line? Okay.

Then NIOSH ORAU Team in the room?

MR. HINNEFELD: Stu Hinnefeld, Interim Director of DCAS. I don't have a conflict at Piqua.

DR. NETON: Jim Neton, DCAS, no conflict, as well.

MR. KATZ: And on the line, any NIOSH ORAU Team?

MS. JESSEN: This is Karin Jessen, ORAU, no conflicts.

MR. HALSEY: Roger Halsey, ORAU, no conflict.

MR. POTTER: Gene Potter, ORAU team, no conflicts.

MR. KATZ: Welcome, all of you. SC&A team in the room?

DR. MAURO: John Mauro, SC&A, no conflict.

MR. KATZ: And on the line?

DR. BEHLING: Hans Behling, no conflict.

MR. KATZ: Welcome back, Hans,

from yesterday.

DR. BEHLING: Thank you.

MR. KATZ: And then HHS or other agency personnel or contractors working for one of the departments in the room?

MS. LIN: Jenny Lin, HHS.

MR. KATZ: And on the line? And then any members of the public on the line who would like to identify themselves for the record?

MR. DECKER: Richard Decker, no conflicts.

MR. KATZ: Welcome, Richard. Okay, and I should have introduced myself. My name is Ted Katz. I am the Designated Federal Official for the Advisory Board. And the agenda is yours, Dr. Poston.

CHAIRMAN POSTON: Okay. Well, I thought it would be a good idea to start, since we haven't talked about Piqua for several meetings, and to go back and go over the presentation which was made in Port

Jefferson. And Jim or Stu, Jim's going to do that. I'll just turn it over to Jim.

DR. NETON: Yes, thanks, John. Chuck Nelson who is our point of contact for Piqua was not available today, so Stu and -- work myself. I'm going to lead the charge, working with Stu as well as Karin Jessen, Gene Potter, and Roger Halsey on the phone. They are the ORAU folks that worked on the Evaluation Report. So with their support, we are going to try to provide a picture of where we are with Piqua. I thought -- I have this presentation that Chuck gave at the Port Jefferson, New York meeting in October. I'm not going to go through all of the slides in detail, but I'm just going to refresh people's memories about the site and what our position was at that time.

It is an interesting facility. It is a 45-megawatt organically cooled moderated reactor, sort of a mom and pop reactor demonstration project located in Piqua, Ohio

which is probably about, I don't know, maybe an hour's ride north of here. I never heard about this until this project. It is an interesting concept. It was a Atomics International design and build, and the idea was they were going to build it and the City of Piqua workers would take over and operate the reactor. Like I mentioned, it was an organically cooled concept. It initially went critical in '63. Operations were suspended three years later in ‘66 and it was finally decommissioned in February of '69. So the original covered period by the Department of Energy was '63 to '66. But in searching the records, we recognized that there was three years where they were doing D&D and eventually, you know, we provided information that got the extra three years covered. It becomes important later as you will see. That's just a photo of the reactor dome there, auxiliary building and a vent stack, 125-foot vent stack. The control room is in the

auxiliary building, obviously, and some waste-handling operations. Pretty small footprint.

We received a petition back in August 2008 and it was originally all employee-associated with the reactor from '63 to '66, but after we went through and expanded the period, we ended up covering through '69. The petition bases no records on activities related to dismantling. The person who filed the petition really was concerned about the D&D operations, not really -- in discussions with him not so much about the routine operations of the plant. To my knowledge I think he was okay with what we did at the Board meeting which is to add the '66 to '69 period. We have access to a number of annual summary reports, reactor design, system documentation, shielding, those sort of things, but we really have very little in the way of monitoring records for this facility.

So the current Class we evaluated, I mentioned '63 to '66. We went through our

various sources to try and find records and obviously did not come up with too much except design documents and some AEC reports I`ll talk about later. We did interview a number of people. I believe we did nine -- interviewed nine individuals for eleven total interviews. We interviewed a couple of people twice. Karin and others on the phone, correct me if I am wrong here because I'm doing this from memory.

MS. JESSEN: Nine is right and we interviewed two twice for a total of eleven interviews.

DR. NETON: Thanks. And we went through our usual sources of available information, looking at OSTI and we actually went to the Cincinnati -- Piqua Public Library. We did a fairly comprehensive record search looking for things. The slide summarizes the data-capture efforts: fairly typical of these 83.13 petitions.

A little bit about what we have in

the way of claimants for Piqua. We only have five claims that have been submitted to NIOSH for this facility. I was just looking through the records for the meeting, and it appears to me that only -- four out of the five claims have been awarded compensation either through original dose reconstruction before the SEC or subsequently were awarded compensation based on the SEC. But there is one claim that was dose reconstructed with a PoC less than 50 percent and I believe his -- I'm sure his exposure was in the earlier period. In fact, I think it was a Atomics International worker so he wouldn't have been there during D&D. He was there sort of during the initial phase of the operation.

Again, a small reactor: 45-megawatt. Cooling is an interesting concept in the fact that it freezes, quote unquote, below about 280 degrees Fahrenheit so if you have a spill or a leakage, if it's a liquid at very high temperatures, below 300 degrees it

solidifies, so you kind of scrape it up and clean it up. So it is important I think because in our opinion that minimizes potential for contamination. It does undergo radiolytic decomposition and that ended up to be the death knell for this reactor, is it -- what they call high boiler, which are solidified chunks of the reactor coolant would build up in the loop and plug things up.

Standard, you know, it's a degasification purification. All of this though, by the way, was during normal operations, handled remote, all remote-handled. They did have, like I mentioned, remote fuel-handling systems, a lot of filtration. They had portable monitors under the NRC and they did have 15 area radiation monitors and this is pretty important; three continuous air monitors were operating in the plant during operations. We take advantage of that for our dose reconstructions later on. Some of these slides would appear to be

redundant. Initial criticality '66, shut down -- '63, shut down '66. Started the recovery program in May of '66 and then completed it in '69.

There's your two periods of operational versus the post-operational. And it is our opinion that activities were very different during the post-operational period. I mean they had the reactor head open, they're going in, they're doing some invasive procedures and cutting things out, that sort of thing. Very different than when the reactor was under power and the systems were sealed. So because of the more hands-on work with open systems and such, we decided we couldn't reconstruct the '66 to '69 period and that was the recommended Class, if you remember. But we believe that we can reconstruct doses in the '63 to '66 period which is why we are here.

This slide just lists the primary sources of internal exposures. There is a

number of different ways one can get radioactive materials in a reactor outside the core. You have activated impurities in the coolant. You have corrosion products, activation of aluminum cladding, tritium -- so these are sort of the mixtures of materials that are available for either inhalation or exposure to photons and betas --

CHAIRMAN POSTON: Most of these are short half-life.

DR. NETON: Right. And you see the internal doses end up being fairly small. Again, with a lot of supporting operations in the final safeguard summary report, monthly, quarterly, semi-annual reports of plant conditions. A lot of operational data but not much in the way of personnel monitoring data. It is important, though, to point out that all data were found to be less than the maximum permissible concentration for the most restrictive radionuclide, which in this case was cobalt-60.

DR. MAURO: And that's all these 15 general air samples?

DR. NETON: Air samples and the CAMs. So, and actually, I don't know -- Karin, do you know if we have, actually, the CAM data or we have just indications that the CAMs never recorded anything above a certain level?

MS. JESSEN: Roger, do you want to be more specific on that?

MR. HALSEY: I would like to. I'm looking.

DR. NETON: While you're looking, I'll just move, forge ahead.

DR. MAURO: But this is a gross beta gamma. Any beta gamma, you will pick up tritium, carbon-14, so you'll, in effect the gross beta gamma is an indicator of how much of that -- those radionuclides, which you don't know which ones they are, might be airborne.

DR. NETON: Right. But our

calculation was the most restrictive nuclide, if you look at the MPCs -- cobalt-60 so we are assuming that if it never went above one MPC for cobalt-60 then that was the highest cobalt-60. Then you can ratio the concentrations of the other radionuclides based on what's known in the source-term of the fuel.

CHAIRMAN POSTON: While we're talking -- change the subject -- we talked about, external is the same. There was a summary report and that was all that was required in those days, but that had to be based on some sort of data.

DR. NETON: They were monitored, yes. We determined that they were actually, I believe, monitored by Landauer. We requested some information from Landauer but have not received anything back on those results, even if they have them. There was a full external batch program, and I believe somewhere in here I think all the workers were monitored that

were working at the plant.

CHAIRMAN POSTON: I was just double-checking because of the statement of the petitioner that no monitors were -- that had to do with the D&D period, not the operational period.

DR. NETON: Well, they might have been monitored, but I think having no availability to -- we don't have the data -- to qualify. It was lost or --

CHAIRMAN POSTON: Right. No monitoring devices were ever offered, is what it says on your slide.

DR. NETON: That was during the D&D.

CHAIRMAN POSTON: That was during the D&D period.

MEMBER SCHOFIELD: In the operational period what was the levels, maximum concentration level they were allowed?

DR. NETON: Well, this would have been, in this particular instance, the maximum

permissible concentration for cobalt-60 in air. I don't recall the microcuries per cubic centimeter value.

MEMBER SCHOFIELD: But it was fairly low, I would assume.

DR. NETON: Not real low. I mean the MPC would give you, if you inhaled it over -- it would give the dose at a critical organ a 15 rem over a continuous exposure: not a trivial inhalation.

MR. HALSEY: I have an answer on that CAM question, and we don't have any data. We have the sporadic monthly reports and a fairly consistent set of semiannual reports where they do mention numbers it is related to people or general surveys.

DR. NETON: But we've interviewed workers, and no one ever recalled that CAM having been alarmed. We assumed they probably were set below the MPC, but, you know, usually we would set it at maybe ten percent or something like that. We are assuming it

didn't alarm and never exceeded the MPC, so that's what we are using. Additional -- progress, and this is sort of what Roger is talking about. These progress reports indicate there is no personnel contaminations or inhalations. Airborne activity containment does not exceed normal background levels. We have found no bioassay data, as we mentioned, although there is indication that some bioassay was performed for a period of one week for some people working around the reactor with no positive results for tritium or beta activity. By all accounts for the workers that we interviewed, and some of them I believe were health physicists working on the project, it was characterized as a fairly clean operation which is what you would expect for a closed system like this. There was evidence of a couple of incidents that occurred at the facility. First one listed here is a soot collection bag for the waste fire boiler system. They would burn the

organic material and some pretty good filtration controls and such. But apparently the soot from the filter housing spread around resulting in about less than 400 dpm per 100 square centimeters contamination which is not very much contamination. And a monthly report indicated that there was no detectable contamination or inhalations though the contamination apparently did spread and they have no indication of any internal exposures.

The second incident that was reported was a leak in a pipe on the main coolant pump. But as I mentioned the coolant immediately solidified as it came out. They scraped it up and cleaned it up. So external exposure sources: obviously photon, beta, and neutron, when the reactor was operating, neutron, for sure, and diagnostic x-rays. So we do have these AEC summary reports that Dr. Poston alluded to that, from start of operations in '63 through '68, in one of the claimant's files we did have some summary

records from '63. We also have the monthly, quarterly, semi-annual reports, and we looked at these reports, and the AEC reports agreed with available documentation. Here's what we have here, '63 through '69 and these are binned according to number monitored, number identified with zero to one rem and number, one to two rem. You can see everybody was less-than-one-rem up until 1967, and there was one individual with two rem cumulative dose in 1967. So the concept here for assigning external dose during the operational period was to assign everyone one rem for these years and even though I believe the '67 was a partial year, we would assign anyone working in '67 two rem. That's -- we believe that's bounding based on the data we have.

There's just some pictures of the personal air lock, remote fuel handling, control room.

Okay. We talked about this briefly but, internal dose we'd assign the MPC

for the entire operational period of cobalt-60, and then based on each group of those other impurities we would pick the nuclide that gave the highest dose to the organ that developed cancer. There are certain metabolic things that you have to consider so you pick the one -- you ratio them all and then find the one that had the highest and assign that.

For the external dose, I mentioned we are going to use the bounding dose from the AEC summary reports: one rem annually for all years, two rem in '66. The beta dose is a little tricky. We had some surveys that showed some ratios, and then we also did some modeling based on VARSKIN with the nuclide mix that was out there. It would have been to apply beta to gamma ratio of 40 to 1 to 5 to 1, based on the cancer. I think it was skin cancer. Help me out here, guys. I think skin cancer would be 40 to 1. That can't be right. It's because it was an extremity cancer or a dose to the other parts of the body. So an

extremity dose, I believe would be 40 to 1 beta to gamma ratio and 5 to 1 for other locations.

MR. HALSEY: If I could jump in. The 40 to 1 is for direct contact.

DR. NETON: Okay.

MR. KATZ: Who is that speaking, sorry?

MR. HALSEY: Sorry, this is Roger Halsey.

MR. KATZ: Thank you.

MR. HALSEY: The 40 to 1 is for anything with direct contact to the skin and 20 to 1 for any areas that wouldn't have direct contact such as contamination on clothing, I would expect.

DR. NETON: Okay. Then the neutron exposure, we had some survey data, some parallel survey data of gamma and photons and the highest ratio that we could come up with was 1 to 10 neutron to photon ratio. So we would assume essentially ten percent of the

-- any of the external dose for the photons would receive ten percent neutron exposure. Ten percent of that would be added to the dose.

DR. MAURO: And what measurements were made to give you that?

DR. NETON: These were made in the plant shortly after operations.

DR. MAURO: So there are paired measurements -- they use a long counter?

DR. NETON: Yes.

DR. MAURO: And are coupled by survey year? So basically you have coupled measurements with the long counter which is good. Okay, so you had -- what are the things -- we will get into -- ours is like the book and some of that data, so where it was taken and how comprehensive it was.

DR. NETON: And the medical dose we will use TIB-0006 for reconstruction of occupational diagnostic -- that's it in a nutshell. I mean it's -- we believe it's

feasible to reconstruct these doses from '62 to '66 and '66 onward period is already an SEC. It is pretty straightforward. We've got a couple of dose -- sample dose reconstruction. I don't know if it is instructive or not, but I'll just go through. Here's a BCC of the temple for a worker who was born in 1940. So this was skin cancer. He worked from '63 to '66, the three-year period that we are reconstructing. We would end up assigning an external dose of about -- external 22 rem -- about 600 millirem internal, some medical, with a total dose of 23.2 rem which will result in this particular example of a PoC 62 percent which we compensated for.

DR. MAURO: So the beta dose in this case, this is something to the face, you would have used the one-rem-per-year times five to get the beta dose to the skin?

DR. NETON: I'm not sure. I believe that's the case. Whatever we had

written in the ER. I have not -- that would make sense. It would probably be five. It really doesn't matter because the case is already over 50 percent.

DR. MAURO: I just wanted to -- the mechanics.

DR. NETON: Yes.

DR. BEHLING: Jim, this is Hans Behling. I would like to make a comment with regard to the issue of using cobalt as your reference radionuclide. Earlier somebody on -- at the meeting raised a question of what was the actual concentration MPC value for cobalt, and I believe NIOSH used nine times ten to the minus nine microcuries per mL and on that basis you concluded that since there were no alarms that were set off you can reasonably conclude a limiting or bounding value.

One of the things that I did look at in reviewing the ER was the issue of carbon-14 and when you realize that there was probably quite a quantity of C-14 produced if

you look at page 21 of the ER, it talks about the degasification system and the other systems that were obviously there to remove the C-14. And when you look at Appendix B of 10 CFR 20 you realize for C-14 the MPC value goes to, let's see, four times ten to the minus six, which is 444 times the value for cobalt-60. Also the MPC value for CO2, in other words carbon-14 in the form of carbon dioxide, is five times ten to the minus four so it's about 4,000 times higher. Since you cannot measure, obviously, C-14 on the area monitors, how do you deal with that and you knew very well that there had to have been a significant release of C-14.

DR. NETON: Good question. Anybody on the other end, from our end, can answer that?

MR. POTTER: This is Gene Potter. We used the value of the MPC for cobalt-60 as Jim has described, and then we ratio for tritium and carbon-14 the amount, in the case

of carbon-14 the amount of the carbon-14 from that soot sample.

DR. BEHLING: Yes, and I'm fully aware of that, and there's a serious problem in making that assumption because the C-14 would have probably been volatile and would not have remained there. So that the use of that residual soot material is probably not a very credible source for identifying the ratios. Obviously when you deal with highly volatile materials and you are dealing with a sample that you are talking about, you are probably not going to get a very accurate relationship between the various radionuclides.

DR. MAURO: In fact the one area -- well, I knew -- the one area where -- I understand exactly what you did. To get -- since you don't have measurements of carbon-14 and tritium in the air, you took advantage of the ratio of the particular radionuclides in the coolant and knowledge of the tritium and

carbon-14 in the coolant. So you have a mix, understanding of the mix in the coolant. Now you -- and you also have what's airborne, particulates. Our understanding is you took advantage of that ratio, and it's sort of the same, but the reality is what I think would happen is there's -- it was highly more likely that carbon-14 and tritium are going to become airborne than any of the particulates. So the ratio that you see in the coolant -- is going to be quite a bit different than the ratio you are going to see in the air. In fact the expectation would be what's in the air for carbon-14 tritium would be much higher relative to the particulates as compared. So I think that approach -- it's just that approach -- it doesn't work. I'm not quite sure how to skin that cat because I don't think those ratios will hold for some of the reasons Hans just mentioned. In fact that's the only --

DR. NETON: -- I was not aware

that you guys had actually even reviewed this.

DR. MAURO: We just read it. We were asked to just read it. We didn't do anything else but read it and think about what we read.

DR. BEHLING: The other thing I want to address and maybe it's -- might be out of context here but the issue of nitrogen-16. There was a reference on page 31 of the report that talked about the likelihood that there was air inleakage into the cooling system because of the presence of argon-41. That being the case, you also have the risk of inleakage of air that involves the production of N-16 and that is a very, very short-lived but very powerful gamma emitter and that is something you always deal with a BWR reactor, and I was wondering if in fact that could have also been a serious exposure potential for external radiation exposure during the time of operation, and that was not addressed.

DR. NETON: Well we have summary

badge results unless you are suggesting that N-16 is so high these badges wouldn't have picked it up. I mean we are using the summary reports for the workers that were badged. It appears to us that almost all the workers were badged.

CHAIRMAN POSTON: Well, based on what I read, this is not a like a BWR, Hans.

DR. BEHLING: I know that, but there was air inleakage into the coolant, and therefore --

CHAIRMAN POSTON: Yes, but the steam was forded under the river to the other side to the steam plant. So the half-life, N-16 only plays a big role when you are sending it from the reactor to the turbine directly.

DR. BEHLING: Yes, it's about seven seconds is the half-life, but I know in a BWR you still see a fairly high exposure rate in the turbine deck based on the flow of steam and -- that carries the nitrogen-16, so even for --

CHAIRMAN POSTON: Yes, no question about that.

DR. BEHLING: I didn't hear the last comment.

CHAIRMAN POSTON: I just said no question that that's true in a BWR, but I'm not sure this is the same as a BWR with a seven second half-life and the transit time of the steam from the reactor on one side of the river to the power plant on the other side of the river. I don't know what that time is.

DR. BEHLING: Well steam travels pretty quickly in those systems.

DR. MAURO: So the concern is that there might have been at the turbine which is some distance from the -- the steam was sent under the river, and that is where the turbine was. The turbine wasn't on the plant side, it was someplace else. If you are going to get a nitrogen-16 it would be on the turbine shine.

DR. NETON: But I'm still not --

(Simultaneous speaking.)

DR. MAURO: -- workers, right.

CHAIRMAN POSTON: It won't affect the workers in the plant.

DR. MAURO: I hear what you are saying, John, okay. I don't know whether we should be -- we have -- like I said, I don't know where you want to go from here, but we have read it and we have some notes in some of the places that we would like to talk about.

DR. NETON: Well we're -- that's pretty much --

CHAIRMAN POSTON: Jim is finished.

DR. NETON: Then it does state, the review of the Site Profile, there really --

CHAIRMAN POSTON: There isn't a Site Profile.

DR. MAURO: No, it's just ER.

DR. NETON: -- an ER, all we --

CHAIRMAN POSTON: That was a mistake on my part.

DR. MAURO: Yes, we thought there

-- we were looking --

CHAIRMAN POSTON: I was assuming there was a Site Profile.

MR. HINNEFELD: With just five claims, oftentimes we won't write a Site Profile. We will just write the basis of the claim.

CHAIRMAN POSTON: That was a mistake on my part.

DR. MAURO: It was a very thorough ER. It's a Site Profile. Well it is really exposure matrix.

DR. NETON: It's pretty simple.

DR. BEHLING: Can I also make another comment because of the fact that I think the opening statement by Jim Neton talked about the difference between operational, post-operational and the difference of potential exposures of closed systems versus open systems. But you know when I look at the ER and on page 16 you have a table 5-1, a summary of operational period

history and it looks like there was a lot of problems with this demonstration reactor that mandated the opening of the systems for exchanging filters, rearranging fuel and et cetera, et cetera. that started basically in May of 1964 and continued throughout the period of 1966.

So we are not dealing with a clean machine here that was essentially in a perfect steady state of operation. They had serious breakdowns, and there was a continuous need to rearrange fuel and exchange filters and concern themselves with various problems that they encountered. That's to be expected when you deal with a demonstration reactor, one of kind. So I'm not totally in agreement with the assumption that during the period of operation we are dealing with a closed system. They have to go in there repeatedly as indicated in table 5-1.

CHAIRMAN POSTON: Well it's unclear to me because you certainly can -- the

reactor was designed to be refueled while it was operating so you are not opening the system, but I'm not sure about the filters. I couldn't figure that out based on the information that was presented in the report. So you may be right on the filters. You may not be right on the movement of the fuel.

DR. MAURO: John, I think both you and Hans have pointed out the area that -- is where are the vulnerabilities. We understand the rationale except for this business of the ratios that I talked about earlier. That's one area where we think that there could be a problem. And not that those doses were necessarily high, but that way of coming at the problem, I don't think will work. But this idea of opening up, in effect what we have, it boils down to something pretty simple if you are thinking in the terms of internal. What we have here sounds like plenty of air -- CAM, continuous air monitors plus effluent monitors would show that at no time do the

alarms go off and they're always below the MPCs, maybe well below the MPCs. Now, but the -- of course, that means wherever those monitors are, that's what you are seeing. That coupled up with information on what was in the primary coolant.

Apparently there were two pieces of information that were very important. One is that there was a failed fuel detector that determined was there any failed fuel. And the answer was no. And the fact the gamma spectrometry of the coolant itself did not show any cesium-137, did not show any iodine-131, I don't believe. And so you only saw the things that might come from tramp uranium, that might come from activation products, corrosion products.

So there is a lot of weight of evidence there that yes it looks like that's the mix of radionuclides that were observed in the gamma spectroscopic analysis of the coolant is the -- are the radionuclides of

interest, separate from the tritium and carbon-14. That being the case, okay, then you say all right, I think we know what we are dealing with. And we also feel confident that whatever might have escaped by way of short lived fission products and activation products, they certainly didn't result in airborne levels at the locations of the continuous air monitors and the effluent monitors that exceeded the MPCs.

So we are walking along hand with you hand in hand now and we are fine. But then we have what I am visualizing this opening up, and you mentioned the filters. There is a lot of filter surveys, maintenance work. I'm not even sure what these filters are. Maybe it is coolant filters, to pull out these little chunks of wax, and all of a sudden now we have a situation. I'm talking about this in terms of softness, where you might be soft. You've got a guy doing maintenance inside this -- next to this

component. What the airborne levels might be there might be substantially different than what the airborne levels are where the continuous air monitor is. And it would really be great if we had some bioassay samples for the maintenance workers that were involved in those activities. That would nail it.

I know that there were some bioassay measurements taken, and one of the things you look for is basically you come at it with a line of argument that is basically a couple of dimensions. This all hangs on the continuous air monitor, very important, and the MPC issue. And the fact that you assigned an MPC of one the way you described it, certainly claimant favorable given that those readings from the continuous air monitors represent the concentration of radionuclides that workers experienced.

And the only question I have is some of the workers were at places doing

certain jobs, especially the maintenance people when the reactor was down, and they were doing these various in vessel filters, fuel elements for examination. So when you start doing things like that, it is pretty intrusive. Now you said something before that all of that was done remotely.

DR. NETON: Well no.

DR. MAURO: No?

DR. NETON: Fuel handling.

DR. MAURO: Okay.

DR. NETON: I don't know about these other activities.

DR. MAURO: Other activities.

DR. NETON: My only thought on that is we are assigning the MPC, which is effectively a time-weighted average. So if you work there 2,000 hours you are going to get 2,000 MPC hours.

DR. MAURO: Right.

DR. NETON: No one believes that the alarms were just below the MPC for every

work hour. And then the question is, what is the plausibility of those open filter service issues? What is the plausibility of some much higher concentration and what period of time?

DR. MAURO: Right, I agree. I'm not saying that -- we didn't say where would the line of attack you've just taken have some softness to it.

DR. NETON: And frankly I wasn't prepared to argue.

DR. MAURO: No I'm not even arguing. I'm just saying our mandate was very limited. Ted said, John just read it so that when you come to the meeting you can at least give your initial impressions on where you are strong, where you are weak. The other area that I would like to hear a little bit about, the neutron measurements are very important. They basically said there was -- I think it was 0.5 mR per hour was the most that was measured. And on the basis of that, developed your neutron to photon ratio, which is ten

percent. And it wouldn't be a bad idea to go look at that data. I'm saying that -- what are some of the things, we didn't look into the site query database, the Site Research Database. We didn't do any interviews. We didn't do any data capture. We simply read this report and made some notes.

CHAIRMAN POSTON: Why would you expect a neutron dose to be even important? I mean in a typical reactor, even in a PWR, you make entries into the containment but the doses are so small, so low you can't measure and so you actually use a time calculation to assign doses for that. So why would you make -- why would you assume that it plays a huge role?

DR. MAURO: Well, when I was involved in the review of the health physics programs they designed as sort of a survey program for commercial nuclear power plants, one of the big concerns always was neutrons treatment. Is the design such that there is

assurance that there is no way in which neutrons are going to -- so you want to lock it out. There were occasions where neutron streaming became an issue with something. They would design around it. And here we have an experimental reactor.

CHAIRMAN POSTON: But when you talk about neutron streaming you are talking about inside the containment.

DR. MAURO: Yes, yes.

CHAIRMAN POSTON: You are not talking about outside the containment.

DR. MAURO: Right.

CHAIRMAN POSTON: So do we have any evidence that during operations there was anybody inside the containment?

DR. MAURO: Good question.

CHAIRMAN POSTON: And if there's nobody inside the containment then neutrons go away.

DR. MAURO: I would agree with that. When I read it, like I said, when I

read it I said I'd like to see the results, where the measurements were taken and certainly it would be, the measurements would be inside containment in locations based on the design where the possibility exists of streaming.

CHAIRMAN POSTON: That's what separates a PWR from a BWR. They don't make entries in the BWR so there is no neutron dose.

DR. MAURO: I'm trying to give just a sense --

CHAIRMAN POSTON: No I understand. I'm just asking to understand exactly.

DR. MAURO: Now if there was no one entering containment --

DR. NETON: I think that may be true but I would have to verify that.

CHAIRMAN POSTON: And they also raised the issue of the neutron calibration source and that's a no, never mind as far as

I'm concerned.

DR. MAURO: I like the use of a long counter and the way in which you're going to check it. The question is okay, let's take a look. See normally when we do a review of this type, we look at the data. In other words, what we have here is a summary of the data and we look at the data. And the places where I walk away, softness, like we did yesterday, where would I want to sniff around a little deeper?

CHAIRMAN POSTON: Sure, I understand. I have the same concerns.

DR. MAURO: Yes, yes. So internal, and Hans has more to say. Hans read it. I read it. We actually had one of our nuclear engineers read it, but he's not available to us today, and to get our perspectives on it. I walk away with a couple of issues. One is the tritium to carbon-14 ratio, that would be my number one concern, as being a technical flaw in the strategy. The

other is there are some bioassay data. I sure would like to go capture that data and confirm that, yes, everything -- continuous air monitoring certainly provides a very compelling argument that there was very airborne activity and some bioassay data from some of the workers that might have been involved in this maintenance would really put that one to bed, if that data were there. That would be something I would sort of probe for. And that would be the final word. And again, these questions on neutron measurements that were taken and convince myself that there were no surprises. And I was thinking that being an organically cooled and moderated, I guess, reactor, probably even offers even more neutron shielding. So that's probably a plus compared to a light water reactor.

MR. HALSEY: This is Roger Halsey if I could jump in on the neutron question.

DR. MAURO: Sure.

MR. HALSEY: In 1964 they did a

full survey of the plant running at full power for neutrons. Apparently using a long counter, they mentioned it specifically.

DR. MAURO: Yes.

MR. HALSEY: And in the report, there is the table, and the table essentially shows blank for everything except for two areas. And in those two areas where large pipes were coming out of the thing, the actual steam pipes I believe, they have less than 0.5 millirem per hour neutrons. So that's what we used.

DR. MAURO: Yes and I read the point -- less than 0.5 in the report. What I was saying is that one of the things I would like to look at, is to go look at that data. Where was it collected? How much of it did you have? But there's evidence that no one was in those areas during operation. Even that is not an issue and that's not very much.

MR. HALSEY: Well and the other piece of information we have is during one of

the interviews, and I believe it was one of the health physics people, that there were never any neutrons. They did have a meter. They did survey and they never found anything. But this report -- there isn't anymore data than the summary table. It is the same problem we have with all of this. We are dealing with summary data it was reported to AEC and we are looking at the results not the details that went into it.

DR. MAURO: What I am trying to say is normally what we would do is we actually go and go look at the individual film badge readings if the film badge records are there and take a look at who was monitored, the amount of data, how the monitoring was done. Get into the fine structure. But unfortunately we don't have that. We have the summary level and captured it and demonstrated that it is unlikely that anybody got more than the data show. No one got more than one rem per year except for a couple of people.

DR. NETON: One person in the last --

DR. MAURO: And that's -- and basically you are hanging your hat on -- are we going to assign one or two rem per year based on the summary level data? It is hard to say there is anything wrong with that. It seems to be based on the data you have. Now of course you are hanging your hat on that, it's possible that there might have been some workers that were unmonitored, that could have gotten higher exposures. We don't know. These are the kinds of things we would do in follow up.

MR. HALSEY: Also, we assume that that summary level data for the film badges did include the neutron components but we don't really know. That's why we added a ratio independently of that data.

DR. MAURO: Oh, the ratio you use is ten percent. So in other words you added in -- so the one rem is the total whole body

dose, neutron plus photon? I didn't follow you.

DR. NETON: It could have been, we don't know.

MR. HINNEFELD: We don't know what -- theoretically, they would have reported as the total body dose.

DR. MAURO: In other words, when you reconstruct a person's dose.

DR. NETON: We assume it was only gamma.

DR. MAURO: And then you add in the ten percent?

DR. NETON: It could have been already.

DR. MAURO: You've interpreted the data in a claimant favorable way.

CHAIRMAN POSTON: And I understand that Jim said that they requested the data from Landauer so if we do get it then we have the individuals. But the summary report was all that was required in those days.

DR. MAURO: I understand that and it is compelling.

CHAIRMAN POSTON: Yes.

DR. MAURO: Especially if everybody was monitored.

DR. BEHLING: Does anyone have the answer to the following question? I'm looking at table 6-1 and 6-3 and they identify by year the numbers of people who were monitored and their doses. It seems like the numbers of people are almost a constant during the operational and post-operational period. And has anyone looked at these individuals and said to what extent were the people who were monitored during the operational period, or at least a fraction of those people were also there during the post-operational period? In which case the SEC time frame wouldn't matter if in fact they were almost largely the identical population of workers post and pre or post-operational and operational. Does anyone have an answer to that question?

MR. HALSEY: All we have is the summary -- this is Roger Halsey again. All we have is the summary data and we look at the very first column there that says number identified as not monitored is zero.

DR. BEHLING: Yes.

MR. HALSEY: And then we have a total number and that's all we have. We have no way of relating that to individuals.

DR. BEHLING: So you don't realize or you don't know -- have any ideas as to whether or not a large number of people who were there during the operational period continued to work there in the post-operational period?

MR. HALSEY: Just in the general terms that the, city employees were the people that disassembled the plant. We have that kind of language in the reports. But no, as to which individuals were there and how much turnover they had, we have no idea.

DR. BEHLING: Okay.

DR. MAURO: I've got a question that's not directly relevant but why is this system -- this is a commercial -- the fuel wasn't used for weapons. It was used to make electricity in Ohio. How come this -- it is another commercial nuclear power plant.

DR. NETON: Well, it was a demonstration project. I'm not sure why --

DR. MAURO: For some reason they put it in. I didn't see any connection between that.

DR. NETON: I really don't have an answer for that.

CHAIRMAN POSTON: Except I'm sure the money came from AEC.

DR. MAURO: I'm sure it did.

CHAIRMAN POSTON: Instead of through a contractor.

DR. MAURO: Of course that is what is given to us and that's what we've got. Let me see what else I have here. There really isn't much.

CHAIRMAN POSTON: I'm a little bit concerned about the carbon-14 issue because it is extremely difficult to monitor for carbon-14. If you have a real nice way to monitor around a nuclear power plant for carbon-14 you can make a lot of money, John.

DR. BEHLING: That's exactly what, when I was at Three Mile Island for years that was a recurrent problem. No way can you measure what goes out of the facility because the stack monitors cannot pick up C-14.

CHAIRMAN POSTON: So, I mean it's certain a question but it's not one that has an answer.

DR. NETON: I was thinking this was -- there's another plant like this that had been built. Anybody on the phone that can help me out with this? Did Atomics International actually develop and build another similar facility?

MR. POTTER: This is Gene Potter. Yes there was a similar facility at Idaho.

DR. NETON: Right, that's what I thought. And to the extent that this carbon-14 tritium problem existed there may be some information there that could, I understand that it would be surrogate data but is it or is it not a real problem? I don't know. I mean I am just throwing that out. That may be something that we would want to look into, to shore up that piece of the internal dose issue. Because I understand what you are saying, the release rate of the carbon-14 and the tritium is not necessarily parallel to that of particulates. So that may be something we could explore.

DR. BEHLING: But it's likely that this was, unless there is a system that also used the organic coolant, the source-term for C-14 is obviously used.

DR. NETON: I think it was an organically cooled power plant or reactor.

DR. BEHLING: Yes.

DR. NETON: There was another one

that was built in Idaho as a demonstration project. I don't think they went and dug a whole in the ground in Ohio and said let's try it. They tried it like in Idaho first.

CHAIRMAN POSTON: That was the name of this Idaho site at one time, reactor testing station.

DR. NETON: Right. So I mean that's the only thing off the top of my head right now that I can offer that we would certainly be willing to look into. Because I do agree that it's unclear.

CHAIRMAN POSTON: My blush -- I re-read this on the airplane coming up and my take on this, there may be some, as John called them, soft areas, but what you are proposing seems to be fairly claimant favorable. You are assuming the MPC, 2000 hours per year, that kind of stuff and maximum dose because you don't know what is really the dose to each individual. You take the high end of the category in which they were

reported. That seems to be claimant favorable also.

DR. BEHLING: Well, except that the MPC for carbon is especially if it's CO2 carbon is about 4,000 times higher than it is for cobalt-60 and of course we don't have any measurements for that. That is the limiting factor here.

CHAIRMAN POSTON: Well you are going to have to give me a chemistry lesson to see how you are going to get from organic to CO2.

DR. BEHLING: Well you are starting out with an organic coolant and so --

CHAIRMAN POSTON: I understand that.

DR. MAURO: Well, like I said, you know when you read one of these, you say to yourself and you think about it, you know. How are you going to get -- is it possible that the airborne exposure to CO2, carbon-14, or other forms that it might take, I don't

know, and tritium, could be important. It may be just to demonstrate that it could not be important by some way or try to get a handle on what the levels might have been. Unfortunately I think you are right. This is a tough nut to crack and the ratio approach to the coolant really isn't going to work very well. I'm not sure how you would come at that. No tritium samples at all. See you get tritium, you might be able to say okay the tritium is going to be indicative of -- well you have the tritium coming out. I think we showed this, a ratio from the tritium to carbon-14 in the coolant. That would be a little closer to home if there was some tritium measured. They do measure tritium.

DR. BEHLING: Yes, John there's no relationship between the production of tritium and C-14.

DR. MAURO: Okay. So in other words the degree to which they may partition out of the coolant when they opened up somehow

-- whatever the leakage might have been, the tritium -- how I'm thinking is, well the tritium has a certain tendency to become airborne and carbon-14 has a certain tendency to become airborne. If the argument could be made that the tritium has a greater potential to become airborne than the carbon-14, then you can say okay well somehow we can get a handle on what's airborne tritium and we know that since the tritium is even more volatile, let's say, than the carbon-14 then you could say we will use the ratio tritium to carbon-14 in the coolant as a way to get a hook into it. I know that tritium is very often pulled. Do you see where I'm going? I'm trying to find a line on how to get a handle on that.

DR. NETON: I'm recalling now that I think we have one of the claimants, I think it was an Atomics International employee, who was pretty well monitored. We may have bioassay data on that person.

DR. MAURO: That might be your

hook.

DR. NETON: I need to go back. I was just looking through these before the meeting and there is one person that had some bioassay records that I recall. I don't know what it was for, whether it was tritium or not.

DR. MAURO: I remember reading that no one -- the people that were -- a statement was made that the people that were bioassayed no tritium was detected. That's important, I remember reading that. That is important because that might be your hook. You see, in other words you say, okay that means that, trying to come at the problem, you say, well that means the highest concentration could have been, is that concentration which would be just below the limits of detection. That will give you a way to say it was not likely that this guy could have been exposed to levels of tritium that are much higher than this. But of course the tritium has a 10-day

half-life. There are problems. Like I said, this is the softness and this is the one place where I guess I'm not too sure how to skin that cat.

DR. NETON: Well, all I can do is we can take it back and look at it. We are not going to solve it at this meeting.

MR. HALSEY: This is Roger Halsey again. This is kind of not my area so Gene correct me if I'm wrong. This is an organic material. The hydrogen and the carbons are pretty much traveling together when they are burned and released they are pretty much traveling together.

DR. MAURO: Yes. I've been thinking about it in a more classic sense, as tritiated water vapor, but maybe you are right. Maybe any tritium that did become airborne was the hydrogen associated with some carbon. I don't know.

MR. POTTER: This is Gene Potter. There is also apparently a tritium source

from ternary fission that would have just been present in the coolant. I believe we have tritium levels in the fuel storage pool. This is sort of thing that one could use for tritium possibly knowing what the concentration of the water is.

CHAIRMAN POSTON: Yes, the tertiary fission is pretty low but that might be something you can hook onto.

DR. MAURO: If I recall tritium is produced both by fission and also activation, right, at least in light water reactors?

CHAIRMAN POSTON: In light water because you have lithium.

DR. MAURO: Because you have lithium, that's right.

DR. BEHLING: Yes, it's lithium hydroxide.

DR. MAURO: All right, okay. We're trying to find out where we can find some solace. It sounds like, you know, by and

large your argument is very strong. You see our reaction here. That's really all you are getting right now, our reaction.

CHAIRMAN POSTON: Okay. Bill.

MEMBER FIELD: Landauer, they are likely NTA detectors, wouldn't you think, in that time period?

MR. HINNEFELD: I think it would be NTA in that time frame.

MEMBER FIELD: I would think getting that information is going to tell you a lot about other sources and as far as the bioassay it would be interesting to see what they show as far tritium. Now C-14 becoming airborne is that something you can see in the tritium or in the bioassay?

DR. BEHLING: No, I'm not even sure I know how you really check for C-14 in an accurate way. But in the case of this facility, I would assume that a sizeable fraction if not an overwhelming fraction would be in the form of CO2 because of the organic

component of the coolant and as John already mentioned, it would obviously be at least as quick to be removed as tritium in a form of water vapor because it is a gas.

CHAIRMAN POSTON: Well, I don't know about the radiolysis of this hydrocarbon. It seems to me is that's the key to what happens. We know what happens with water but I don't know what happens when you take a hydrocarbon like this and expose it to radiation how it breaks down exactly. And how it might recombine.

DR. NETON: Well, there may be some studies out there, particularly for this application, because it is not very radiolytic.

MEMBER FIELD: They performed the gamma spec with the coolant, right? At least you know that much.

(Simultaneous speaking.)

DR. NETON: There may be some research papers out there that would help

developing this particular coolant material.

DR. MAURO: Well I mean I know how a lot of folks don't like models but in theory you have measurements of carbon-14 and tritium in the coolant. You have those numbers. Those measurements are made I guess in various -- whether it was coolant or whether it was some kind of crud or crust. So you have some numbers. Then you have to ask yourself a question. Okay, what fraction of the inventory that might have escaped and given this operation -- things like that don't happen all the time but it would require some kind of models and assumptions, I don't know what the partitions might be. Something like this, and put an upper bound on it. I don't know.

DR. NETON: Again, we're going to have to go back and look at it. There's a couple of different ways to approach it. Looking at the research of the development of the coolant cell, looking at some of the

bioassay data they may have on one employee --

DR. MAURO: I think bioassay data. If you've got a number of employees.

DR. NETON: I think we might have one.

MR. HINNEFELD: We've only got five claimants.

DR. NETON: There's only one claimant that's been denied.

MEMBER SCHOFIELD: Well I've got a question. Going back to the fuel rods, the spent ones, the base in numbers, the tritium in that area wouldn't that be significantly higher than inside the containment dome. But I would assume the workers don't spend a large amount of time in the basin. I mean I'm not real familiar with it, but correct me if I'm wrong so those numbers would be much more elevated in the basins wouldn't they?

CHAIRMAN POSTON: Well, yes I think you are right. Because half-life of tritium is, I forget what it is, 12, 13?

MR. HINNEFELD: Twelve or 13. I think it is 12 years.

CHAIRMAN POSTON: So it's not going to go away. But the other thing John and this is blue sky stuff but if you have high temperatures, tritium will just go through most anything like piping and so forth but I wouldn't expect carbon-14 to go. I'm going back to yours. If you can pick on the hydrogen on the tritium.

DR. MAURO: Then the ratio holds.

CHAIRMAN POSTON: It has got to be an upper bound to the carbon-14 --

DR. MAURO: Yes. Somehow you can get it.

CHAIRMAN POSTON: It can't be more than that. It has got to be less than that.

DR. MAURO: Yes, exactly. The key is how are we going to try and get a handle on what that tritium might be.

CHAIRMAN POSTON: Anything else

then? Questions?

MEMBER SCHOFIELD: No, I just --

CHAIRMAN POSTON: Bill?

MEMBER FIELD: But don't you have a tritium monitor?

MEMBER SCHOFIELD: Well I mean you would have two totally different exposure scenarios of tritium in the containment vessel versus in the cooling ponds.

DR. BEHLING: But how many of the other potential areas, for instance, the degasification system, purification systems that were basically separate from the reactor containment building itself, where there would have been source-terms for exposure?

CHAIRMAN POSTON: I don't know.

MR. HINNEFELD: Same here, I don't know.

CHAIRMAN POSTON: All we've seen are the pictures. I don't know exactly where the gasification systems are. They are in the containment or they are in the auxiliary

building.

DR. BEHLING: Yes, I try to look and there's no indication here but it would appear that in all likelihood they are outside so they would be more accessible. So you don't have to go into the containment structure to be exposed potentially if these systems were the ones where these radionuclides would have been concentrated and potentially exposed in individuals who were there to maintain these systems.

DR. MAURO: Now, when these people develop new reactor technology and they come up with the tech specs for effluent monitoring and continuous air monitoring, they go back to the first principles and figure out what do we have to look for. Now certainly in a reactor people pull their samples through silica gel because they know that tritium could be a problem. Certain reactors are of course much more of a problem than others, like the Canadian reactors. Is it possible that Atomic

International did their homework, designed the facility, obviously came up with a recommended type of monitoring program which they obviously determined there was no need for the tritium. Now they may have a reason for that in their supporting documentation. But it is kind of strange. You have a reactor and you are not worried about tritium. That's of course an opposite being a light water reactor. Now whether or not -- and they may have an argument that says their work shows that there is no reason to believe.

DR. NETON: That's why I'm thinking this Idaho reactor, which is an experimental test reactor, might have had some of the data on it.

DR. MAURO: Yes. As you can see this is where we are sort of gravitating toward this one issue. Because the other issues seem like they are pretty well covered.

CHAIRMAN POSTON: Do we have access to their safety analysis reports and

all that stuff?

DR. NETON: There are some reports.

MR. HINNEFELD: I don't know does the -- ORAU Team might know what's on there. I don't know if we got their safety analysis.

DR. NETON: Their safeguard analysis or something. I have not looked at them.

DR. MAURO: They could have an accident analysis section. Where they postulate different --

DR. NETON: That's what I'm saying --

DR. MAURO: And in that they have to know if there's a tritium issue it will be there.

DR. NETON: We're going to have to go back and look through all the available documentation and see where we can shorten some.

MEMBER FIELD: Yes, I think the

point made though before is a point I was thinking about it last night when I read this and I know we don't have the breakdown about who worked when. But if everyone that worked in the periods covered or the people employed before, I think that would be very unlikely but I think it is possible. I don't think they have to proceed any further.

DR. NETON: No, that's not the case.

MEMBER FIELD: You know it's not the case?

DR. NETON: We have one claimant out of the five who was an Atomics International employee that there during the operational phase with nothing but exposure --

DR. MAURO: -- nothing but exposure.

DR. NETON: One person is affected by this right now.

MR. KATZ: One current claim.

DR. NETON: One current claim that

could be affected by this.

DR. BEHLING: Were there any claimants, Jim who were exclusively hired during the operational period only or are those five people the sum total of all claims independent of each period?

DR. NETON: Those are all five claims. We have five claims and four of the people worked -- well I don't know. I know that two were compensated before the SEC was awarded. So I don't know. I didn't look at that.

DR. BEHLING: I mean the question is if the SEC were to be extended throughout the operational period, if it makes no difference then it may very well be a decision that it will be prompted by expediency that says it's not going to change anything.

MR. KATZ: There's one individual Hans, at least.

DR. NETON: One claim that we have could be affected by this.

DR. BEHLING: Okay.

DR. NETON: The person that worked a couple of years between `63 and `66, but I'm not sure that was even continuous work at the Piqua reactor. He was an Atomics International employee. He may have gone there and did some troubleshooting and then went back.

DR. MAURO: I want to flip around something a little bit Hans. Clearly your sense was during D&D it was so intrusive relative to it, even though during operations there was a lot of intrusive activity taking place.

DR. NETON: Filter replacements, routine maintenance operations.

DR. MAURO: So, there is really a potential for exposure and the data during D&D did just non-existent also? So they were doing all this stuff and there is nothing. Nothing on tritium. Nothing on -- no measurements.

DR. NETON: Not that they didn't take it; we don't have it.

DR. MAURO: We don't have it. Because the only reason I say this is if there is some data, even though there wasn't enough for you folks to feel that you could dose reconstruction, but there might be some data, that will be -- inform us a little bit. Well it couldn't have been any worse than this during operation. I don't know. I mean that's all we have really. Hans do you have anything else you wanted to bring up?

DR. BEHLING: No, but I guess the question is where do we go from here? As I said, we only reviewed the ER itself as opposed to the primary data that was used to develop the ER and I guess that's up for the discussion next year as to where we go from here.

CHAIRMAN POSTON: Any other questions? Bill?

MEMBER FIELD: I think we will

know a bit more when we get the dosimetry data and the bioassay data then we can use that data and make a decision where to go. At this point there is much more data to review. These are summary reports.

DR. NETON: It seems to me the ball is back in our court. We've heard some, at least verbal issues that have been raised and I think we agree that the tritium issues need to be investigated and provide some sort of a White Paper that would summarize what we have or don't have in our baseline data analysis. That's where we are at. I don't think we are going to solve it here in this meeting.

DR. MAURO: And any bioassay data that --

DR. NETON: Whatever we have.

DR. MAURO: There may be only one individual.

DR. NETON: At best, and I'm not even sure about that person. I recall

flipping through and it looked like there may have been something that looked like bioassay data.

DR. MAURO: The other area, besides the tritium, or the carbon-14, the other area that I felt a little uncomfortable with is if a person is doing hands-on maintenance in a compartment or component on a filter --

DR. NETON: I've got that, yes.

DR. MAURO: The degree to which that situation --

DR. NETON: Partitioning versus maintenance.

DR. MAURO: Yes. I think the neutron issue that I was thinking about, you have the long counter measurements. It sounds like there are a lot of measurements. We didn't look at that data but -- we do have a thorough survey during operation in the locations where there could be some streaming, some neutrons escaping, and nowhere is there

more than 0.5 mR per hour and on top of that you could argue no one was there anyway, physically located there for any period of time. That's a very compelling argument.

CHAIRMAN POSTON: I hate to raise a red herring in all this but has there been discussion about separating this into two pieces, or you're so sure that everybody except for this one person is in the same group of people or there's too many, too few claimants to make that?

DR. NETON: I'm not sure we can separate it into two.

CHAIRMAN POSTON: Well I mean you have the operational period. You have the D&D period and so the exposure scenarios are totally different in those two and the question is we don't know whether those are the same people or not. You said during the D&D period there was one person from GA that wasn't in the operational.

DR. NETON: It was the other way

around.

CHAIRMAN POSTON: It was the other way around. One person who was in the operational. But do we know that the people continued on only or is that an assumption only because of the number didn't change?

MR. HINNEFELD: Well, of the claimants, which are the only people we know about, we know when they worked. We know when they started and when they ended.

CHAIRMAN POSTON: Okay.

MR. HINNEFELD: So we don't know what the total potential number of people who worked at the Piqua reactor were either during operation or during remediation. We only know about the claimants.

DR. NETON: And there were at least 50 people monitored at one time. But we have already done that, right? I mean the people who worked between `66 and `69 if they have 250 days and the right cancer are already in the SEC. That's done

MR. HINNEFELD: Okay.

DR. NETON: I remember that part. Now we are just saying we have concluded at least by the last ER that between `63 and `66 we think we've got enough to bound their exposures because this was the routine operating plant and mainly had some maintenance going on. So we didn't believe that it had any exposures above the MPC for cobalt-60 and ratio based on what's in the coolant. To me the only real outstanding issue would be the carbon-14 and tritium and maybe some sort of a bounding analysis of when you are doing maintenance operations. What is the difference between an air concentration in a CAM versus what happens if you open some --

DR. MAURO: I mean and that goes to the ICRP 103. Had ratios on the order of 10 to 20.

DR. NETON: Right.

DR. MAURO: Between breathing zone and the general air. That may be one way to

put an adjustment factor -- because you don't know how much time the person was there then you really --

DR. NETON: I know. When you are changing out filters to me I'm trying to envision this is not an intrusive. You are in there but are you generating airborne? Do you know what I'm saying. Maybe the tritium and the carbon-14 which could be in a gas, I'll grant you an open system, but otherwise you got a liquid or solid system you are opening. I don't see a giant potential here for generating massive quantities.

DR. MAURO: We are pushing hard to find holes. We want to find them now.

DR. NETON: This is the unique one. I mean this is very interesting.

MEMBER FIELD: If there is any contact with the coolant it is going to turn into a solid. I think that would be avoided.

DR. NETON: You would think so unless someone goes in there and starts, I

don't know. I am trying to think of scenarios, normally grinding, welding, cutting operations.

MR. HINNEFELD: Yes, I think anything would evolve off the coolant would be the only exposure.

DR. MAURO: They do have a gas collection system. To think that there is no airborne radioactivity. There is an off gas collection system, effluent monitoring system.

MR. HINNEFELD: Yes, but it runs probably for when it's running in temperature.

DR. MAURO: Right.

MR. HINNEFELD: So the vapor pressure kind of vanishes.

DR. MAURO: Right. So something is being produced during operation. Some gasses are generated inside the system.

CHAIRMAN POSTON: That's the O series or the K tanks?

DR. MAURO: Right and they collected that, monitoring and discharging it.

Probably holding it for a short period of time because they are all short lived, including the kryptons. Now somehow there are gasses being produced. Now shutdown. You shutdown, you go into some of the components. I don't know where you are going to do some maintenance. And the question becomes, does that create a potential for some of these airborne particulates, including the ones that -- now the continuous air monitors never alarmed. So you don't have any data. In other words they are all less than. It's not that you say we've got these many counts per minute. They are all less than.

MR. HINNEFELD: The reports we have indicate that they didn't find anything above MAC.

DR. MAURO: Right. They couldn't see anything. For all we know there was nothing in the air. But you are assuming we will are going to put it at the MPC because it can't be worse than that because no alarms

went off. That's very strong.

DR. NETON: You couldn't operate a reactor on an NRC license and the MPC for six years straight. I mean --

DR. MAURO: Oh yes.

DR. NETON: I do consider that sort of time-weighted average. So you do have some excursions.

We need to show some credible scenario that it wouldn't be above the MPC there and that kind of comes out in the wash. I don't know.

DR. MAURO: There's no doubt that as a health physicist, you say to yourself, no, there are no problems here. Based on what you wrote on the information provided. But I think we have an obligation to probe, poke and say, listen, where there might be some softness. And I think there are a few places that are soft that it may turn out, maybe they are soft but they're still important. There may not have been very much tritium airborne

or carbon-14 at all. But I think the way to what you are coming at it just doesn't hold up.

DR. NETON: Yes, I agree. I mean even out of the analysis that I showed, the internal exposure produced 500 millirem based on our scenarios. I mean they are very low. I forget which organ that was that we reconstructed. I think most of the organs are going to be very low doses at the MPC.

MR. KATZ: There was one person from the public. We have Richard Decker on the line.

MR. DECKER: Yes.

MR. KATZ: Mr. Decker?

MR. DECKER: Yes.

MR. KATZ: You have been listening to this conversation. We just want to know if you have any comments, thoughts that you'd like to share with the group.

MR. DECKER: Well you know, you gentlemen and ladies are highly educated in

this and talking levels above my comprehension and all of my information, bear with me, is from my step-dad that's passed away so it's third person. I just want to make sure the Board is aware that a lot of things happened that aren't written down, that aren't in concrete. For instance he was required to work part of the disassembly period without any kind of training or monitoring. And that was never reported and in your findings you even reported up in Port Jefferson that one of the helpers was looking down into the vessel itself. Like, oh my god. And just wanted to make sure you keep that in mind that there was a lot of stuff that happened that wasn't written down. You are talking about those soft areas. Those are the soft areas that our ignorance during that time period of the dangers. They were pretty lax sometimes.

MR. KATZ: Thank you Mr. Decker.

MR. DECKER: Thank you.

MR. HINNEFELD: Could I ask, was

that Mr. Becker with a B as in boy or Decker with a D as in Dog.

MR. DECKER: Dog.

CHAIRMAN POSTON: Well, I guess we dropped all the way down to the discussion of the path forward. We've sort of got some notes here. Some of the things that I wrote down were the tritium carbon-14 issue if we can get a hook on it, John?

DR. MAURO: Yes, I don't know. Guys, you want to take a run at that?

(Simultaneous speaking.)

CHAIRMAN POSTON: Oh, I was just waking you up. No I was acknowledging the issue. A further look at the bioassay data. I think the neutron issue perhaps can be laid to rest but if we have any information about entry into containment and power or something like that, that they do in a PWR, that would be interesting. But I think that's a no, never mind and that would, as I think Bill pointed out if we have the Landauer data that

would put that issue to rest. So the Landauer data was the next thing I had on and that to me it is very important to have data. Those summaries are nice but they are not very useful although you know certainly your assumptions using them, it's hard to argue with that, but it would be better if we had the data.

MR. KATZ: On Landauer before we move beyond that there's this ongoing contract with Landauer. Is there time frame on that?

MR. HINNEFELD: We have closed our latest activity and we have a list of their customers that is not comprehensive. We need to open another activity to complete our list. I would have to go back and see. It would seem to me that it covers the years we are talking about but I don't know. So what would it tell us, would be do they have any records and we would then, if so we could request those additionally at some sort of procurement action. But they are usually pretty

reasonable about reproducing records.

DR. MAURO: How about Atomics International? They are still around? They have some people that were involved in the design of this facility and that the investigations that they did regarding various performance of the reactor and what kind testing?

MR. HINNEFELD: That's ETEC right?

DR. MAURO: Yes it is, ETEC.

MR. HINNEFELD: We can check. I would suspect we did some search at ETEC about records of this reactor because we found from their radiation safety officer, the person who gave us the exposure record for the AI employee who was there and has the bioassay, that came from ETEC. So, I would guess we made data capture there but we can check on that.

DR. MAURO: Because, I am saying, in terms of talking with people, you folks who designed this, did you look into the

production tritium and whether or not it was -- they run these models you know.

MR. HINNEFELD: Realistically I don't know that we will find anyone still at ETEC who designed -- who was there working 50 years ago in the design of this reactor.

I don't think we will find anybody but we can check and the other clue is organic moderated reactor experiment. It is essentially the same reactor. What kind of information would you get from that. I would suspect it would have been at ETEC, I don't know if the capture would have done it.

DR. NETON: I don't know if we did anything at Idaho. Again, it is an experimental reactor so you think they would evaluate.

DR. MAURO: Well, you try to build a weight of evidence again. We are always in this situation. At some point you get to a place where most people would agree I think you've made your case, you know, based on

weight of evidence.

MEMBER FIELD: But would NRC have any data on this reactor?

MR. HINNEFELD: They would probably have the summary reports that we have but I don't know if they might have some, you mean design things and things like that?

MEMBER FIELD: Safety analysis report?

MR. HINNEFELD: I don't know.

MEMBER FIELD: Back in that period I thought dosimetry records also were sent, but I don't know how long they keep them.

MR. HINNEFELD: Yes, they send annual summary reports to AEC, yes.

CHAIRMAN POSTON: Yes, that's about, now you have to report individuals but in those days all you did was report a summary. And now they were broken down not by one rem but by hundreds of millirem. So, that data might be useful. For example, if you were to find instead of everybody below one

rem was everybody below 100 millirem that would be interesting.

MS. JESSEN: This is Karin. Do you mind if I say something about data?

MR. HINNEFELD: I wish you would.

MS. JESSEN: We have looked Landauer and Landauer made an attempt to find the City of Piqua dosimetry records and no records were found. Landauer did a more comprehensive search for records at various sites but nothing was found. And in addition we also did some searches on the NRC database, the ADAMS database, and nothing was found there either. Really, during this whole ER process we did pretty much do a really thorough search of records and at this point nothing was found. If I remember correctly, we did interview someone who had said that there were records at one point. They were in a shoe box in his desk drawer. And nobody seems to know what has happened to those records. They are gone somewhere hiding

maybe.

DR. NETON: I had heard at one point the City of Piqua took possession of the records and they got lost from there.

MS. JESSEN: Right. But I do remember specifically this one guy said yes they were in his lower, I think he said his lower left hand drawer in a shoe box. We were never able to find those.

CHAIRMAN POSTON: Sort of like Seaborg's plutonium.

MR. KATZ: So we can cross Landauer off the list it sounds like.

MS. JESSEN: Yes.

MR. KATZ: That's even an option and NRC it sounds like you've plumbed --

MS. JESSEN: Right. You know and we were trying really hard to find some of these records because it is kind of hard to hang your hat on something without records and only just the summary data but you know we have looked in all these places that you are

discussing at this point.

MEMBER FIELD: I'm just curious. Do you have the contract ID with Landauer? Do you have that number to give them?

MS. JESSEN: I do not have that number in my notes.

MEMBER FIELD: If you could just get, find one dosimetry report and find that contract number, that's where they have the access.

MR. HINNEFELD: Sensor ID how they find stuff.

MEMBER FIELD: That is how they access things, so it may be helpful if you can do some discovery if even if one person kept their records from Landauer that would be a good way to find them.

MEMBER SCHOFIELD: It also seems like you should be able to find, well I shouldn't say it that way but the log books for the health physics people would have kept for any job that was considered potentially

hot job and you would expect they used a portable CAM in that area so they would have documented the levels, which would give us a real good shield for what kind of --

DR. MAURO: Radiation work permits.

MEMBER SCHOFIELD: Yes, radiation work permits would give us a real handle on those potential.

DR. MAURO: We are looking forward to seeing it.

MS. JESSEN: And one other thing is that we did talk with Jeff Tack. Are you familiar with Jeff Tack?

MR. HINNEFELD: Jeff Tack works for DOE Legacy Management.

MS. JESSEN: Right and we did talk with him and interview him and let me see. I'm looking at my notes right now. He said that all the operational records went to DOE and DOE-LM inherited approximately two to three cubic feet of records from the Chicago

office. There is not a lot of information, only plant drawings and environmental documents and site monitoring. Let's see and then he went on to say there were never any Legacy records transferred. DOE-LM says that all they have are equipment drawings but no exposure records. Then it goes on to say the DOE-LM Chicago office said that all records were destroyed.

DR. NETON: I've heard that before and they magically surfaced.

MS. JESSEN: And then he also went on to say DOE and the City of Piqua do not have any. They were probably destroyed. So those were my notes from my interview with Jeff Tack in an effort to find individual records.

MR. KATZ: Is that T-A-C-K?

MS. JESSEN: Yes.

MR. KATZ: Thanks.

CHAIRMAN POSTON: In the telephone interviews you talked to the health

physicists. Any indication of incidents and those kinds of things?

MS. JESSEN: I would have to go back. I have in the ER there is a summary of the interviews with the people that we interviewed and I would have to go back and review that. I don't have the answer at this moment. Roger do you remember anything?

MR. HALSEY: Not off the top of my head. I would have to look at the notes too.

CHAIRMAN POSTON: I don't remember anything that's why I asked the question.

DR. NETON: There were two incidents. One is a leaking coolant pipe but it kind of a froze and they cleaned it up and then a soot material from one of the burning operations, it was like 400 dpm.

CHAIRMAN POSTON: I was just thinking if there was any anecdotal evidence that came up when you talked to people. Sometimes they say oh yes, blah, blah, blah.

DR. NETON: I didn't do the

interviews, most people indicated it was a fairly clean operation. Exposures were minimal to non-existent. That is about all we have to go on.

MR. HALSEY: I do have my notes from that coolant leak and I don't remember the job of the guy but he did say no one was exposed. They cleaned it up with a shovel. It solidified like wax. They just picked it up and it set up like soap.

DR. NETON: Like soap.

MS. JESSEN: And if you do look at the end of the ER that has the summary of the interviews, a couple of people do mention incidents and it is under the column that says incidents. I just wrote down what the interviewee was stating about incidents.

MEMBER FIELD: I'm just curious do you have this paper that was published in 1970 by Wheelock? It is called Retirement of the Piqua Nuclear Reactor or Power Facility?

MS. JESSEN: Well I looked at

probably over 200 documents. I don't remember that one in particular but if it's in the SRDB I did look at it.

MEMBER FIELD: I just looked up on PubMed, Google Scholar and it is a technical report. You would think this being a research reactor there would be more published.

CHAIRMAN POSTON: In that time period there was a lot of stuff. But, you know, I remember my early days at Babcock and Wilcox it never had an over exposure. We never had an airborne release. We never had anything. Some of these operations were pretty clean.

Okay let's see. The other things I had sort of a question about the radiolysis of hydrocarbon coolant. I don't know how to address that. It seems to me that we need to understand that before we start postulating carbon-14 or carbon dioxide or whatever. I don't understand the mechanism. That's maybe an academic endeavor. I don't know.

DR. NETON: Like I say if they developed this coolant, they must have tested it and it was picked for a reason.

CHAIRMAN POSTON: Yes.

DR. NETON: I think it withstood the temperature.

CHAIRMAN POSTON: Because as you look at the half-life of the radionuclides with the exception of cobalt-60 and tritium and carbon-14, most of them were fairly short lived.

DR. MAURO: Unfortunately though those samples and the gamma spec analysis and the coolant samples, again no one had the presence of mind let's take a look at the tritium concentration. They do them, sorry, the tritium concentration. That was in the coolant or in this waxy buildup. I wasn't sure when they reported the carbon-14 and they reported the tritium whether that was coolant or some kind of special place where they were having a problem and they wanted to see what

the crust was made out of. There was coolant and the old coolant, they did have this carbon-14 ten to the minus two microcuries per cc, number comes to mind. So obviously --

DR. NETON: And if you take a sample of the coolant and it solidifies, you are trying to measure carbon-14.

DR. MAURO: Did someone get into a liquid simulation detection? In other words --

DR. NETON: Dissolved it.

DR. MAURO: The cocktail is an organic. Maybe it just dissolves. I think is it in the cocktail?

DR. NETON: Yes, the cocktail. I don't know that you would dissolve this.

DR. MAURO: This stuff, yes, I don't know. We're guessing, that is what we are doing.

CHAIRMAN POSTON: And the only other thing I had was some question about can we learn anything from the Idaho reactor?

DR. NETON: Right. That's on my list. That's probably one of our best hopes at this point in my opinion.

CHAIRMAN POSTON: Did you have anything else Ted on your list?

MR. KATZ: I don't.

MR. HINNEFELD: Some of the design information that is a question. Did we for Karin, when Jeff said they had design information but no individual information. Did we go look at that? Did we go try to capture what they had?

MR. HALSEY: This is Roger. I'm afraid Karin had to step away to the restroom for a second.

MR. HINNEFELD: All right.

MR. HALSEY: I'll take the note for her.

MR. HINNEFELD: I was just curious because one of the questions we've talked about is potential exposure and filter changes and things like that and the design might be

relying on that, you know. We wouldn't be able to look for individual information -- or do we already know?

DR. NETON: I think we knew a lot about the design.

MR. HINNEFELD: We may have enough.

DR. MAURO: How did they measure the tritium and the carbon-14 in the coolant? It would be interesting to know what they did, the procedure they followed to see what they did.

MR. POTTER: This is Gene Potter. I believe we have from the final safeguard summary --

MR. KATZ: I'm sorry, Gene. Can you start over just because we have a phone going.

CHAIRMAN POSTON: We're all dancing right now Gene. We'll sit down in a minute.

MR. KATZ: Okay, thank you.

MR. POTTER: Okay, from the final safeguard summary report which is I think what the question came up about that report by probably a different name nowadays. There are figures what they anticipated to be in the coolant for tritium and carbon-14 0.21 microcuries per cc and 1.4 times ten to the minus four microcuries per cc respectively. That is a prospective analysis. I assume it would have been safe cited. But it shows that they were considering the production of those elements or those isotopes in the design of the reactor.

MR. HINNEFELD: Which document was that again Gene?

MR. POTTER: That's the final safeguard summary report for the Piqua Nuclear Power Facility. It's in, this is discussed in the ER in sections 7.2.1.1. Those levels are in that section of the ER.

MEMBER FIELD: Jim, in these cases how often did you get the dosimetry data from

Landauer? For a lot of sites you just can't get it?

DR. NETON: Pretty rarely. I mean I think we got some information from Landauer for GSI and that's about the only one I can think of where we actually got it. Other than Landauer data that was already in the files for some reason.

MR. HINNEFELD: I think we got something just recently.

DR. NETON: It's not a very high probability of success when you go to Landauer looking for medical records.

MEMBER FIELD: Yes, they search by that contract number. That's the key.

DR. NETON: Yes if you don't know what the contract, if they changed names, who the contract was actually -- the formal name of the contract.

MEMBER FIELD: Usually there's a number associated with it.

DR. NETON: Yes.

MEMBER FIELD: And that stays the same.

MR. HINNEFELD: Yes, if you can find a number they can generally find it. Brookhaven, we got a bunch -- we got some things from Brookhaven and actually they sent us the microfiche.

DR. NETON: Just a few instances that I can think of where we actually got Landauer data.

CHAIRMAN POSTON: Does Landauer keep the film? I mean this would be film time.

MR. HINNEFELD: To my knowledge, they don't keep the film. What I think they keep is a copy of the report that they send to the customer. That is generally what we get to see.

DR. NETON: Yes.

DR. MAURO: That was too early.

(Simultaneous speaking.)

DR. NETON: They may save it for

a period of time.

CHAIRMAN POSTON: Because at one time people did save them.

MR. HINNEFELD: Nevada Test Site still has theirs.

DR. NETON: That film goes bad over time. Acetic acid or some kind of a weird reaction.

MR. KATZ: So DCAS has the action list. Does SC&A have anything?

CHAIRMAN POSTON: Well I'm not sure at this point.

MR. KATZ: At this point, yes.

DR. MAURO: My thoughts are, under normal circumstances, you know, we are doing a review of a SEC. We would go into the site query database, check all the numbers, confirm everything. Maybe we actually do a site data capture, make a site visit. That is our standard protocol. We do interviews. We do the kinds of things you folks have done and see if we can uncover. However, I think that

might be premature at this time. I think there are things that you folks would like to do first. It is at that point, then, I think we will make a determination whether you want us to prepare a separate report. You have nothing from us right now, except what you have heard.

DR. NETON: But I think we need to evaluate these soft areas and come back. Who knows what our conclusion will be after we go through all of this. And then we will provide our White Paper and ask SC&A to review it and dig deeper.

CHAIRMAN POSTON: That makes sense to me. I think that's what -- I agree. We need to let you guys do your job.

DR. NETON: The last question is, how soon are we going to produce this, I suppose. I really can't comment until I sit down. We'll get something out on this to you in a time line. I need to talk to the folks on the phone and figure out what their late

schedule looks like.

CHAIRMAN POSTON: Well, I mean, some of these folks have already been compensated. Is that correct?

MR. HINNEFELD: Four out of five.

CHAIRMAN POSTON: So we're doing a retrospective, then?

MR. KATZ: There could be other claimants in the future.

CHAIRMAN POSTON: Well, what I am looking at is one has not been compensated, the other four have been compensated. So that's everybody that's --

MR. HINNEFELD: Who has claimed.

CHAIRMAN POSTON: So this is, in terms of priority, where does this fit in? I guess that is something that we have to talk about. There are things I think needed to be done. We have elucidated those that need to be done and I think we've heard general agreement that those are the things that need to be done. The question is not only, what is

your staff already doing, what's on their plate but whether -- how fast does this need to be done. Should we put it on the back burner for a while?

MR. HINNEFELD: It may be useful to have some sort of Board discussion because the Board has a lot of activity. It has a lot of things going on that we have to try and support them all, as John -- we are trying to support them all. So it may be worthwhile to have some sort of discussion with the Board about here's the universe of things that are hanging or work that is going on. How do you want to handle it in terms of what order? Because we can essentially adjust these kinds of work, this kind of work, we can adjust this as the Board wants us to adjust it unless we get some exterior problem like getting the classified information or something. But as general, we can arrange our priorities in whatever way we see fit here. Now we've made our one-year objective in terms of claims

within a year. We will probably be trying to shorten that so that there will be some things we will have to, some we will have to divert to that. But in terms of available for Board activities, we can work in any order that the Board prefers.

MR. KATZ: Stu, you were going to Jim -- Dr. Melius and I and you had discussed getting sort of a compendium of status.

MR. HINNEFELD: Yes, we are compiling it. I've had guys out on HPS meeting and then on leave and travel. That's where we are.

MR. KATZ: But this is just for John and -- this is -- they are working on sort of a compendium of what's the status of activities related to a variety of things SC&A has reviewed that are on the Board's plate and so on. Where is DCAS with these different items, and I think that this really fits in that conversation that, once we have that, if there can be an ordering of priorities so that

the Board can be helpful to DCAS in setting its priorities related to Board support.

MR. HINNEFELD: Right, and at least we all will be working with the same set of expectations in terms of what are things we really want to try to make progress on.

MR. KATZ: Right.

CHAIRMAN POSTON: Well, two things. We have a telephone conference coming up, right, and we have a Board meeting coming up. I guess the question is, what do I report in terms of the progress that we have met, we've looked at the report, the ER and we have some soft issues that you guys are dealing with.

DR. NETON: I would say it is unlikely we will have a White Paper out before the Board meeting.

CHAIRMAN POSTON: As always seems to happen, they sold this Working Group to me saying, well, this is an easy one. Why don't you take it?

MR. HINNEFELD: It's never as easy as it sounds.

CHAIRMAN POSTON: It's never as easy as it sounds because there are always questions.

MR. KATZ: I actually recall that you enthusiastically volunteered, John.

CHAIRMAN POSTON: I didn't show you the bruises that occurred before that.

MR. KATZ: Someone trying to speak on the phone?

MR. DECKER: Yes, this is Richard Decker again. I just wanted you know, based on what you were saying and I know the Board is busy, I wanted to give you a petitioner's side of the story of what's more important. In my case and my family's case we battled this for nine years before we got the Board's recommendation up in Port Jefferson that helped us out. And I'm on the phone because I want to help anybody that has went through this. Just keep in mind that when you are

setting your priorities and I understand everybody is busy, that some of us out here have been battling this for, like, up to nine years for our family. So I would just keep that in mind when you are trying to prioritize the Board's decisions on what to do next and when to do it and that's all. Thanks.

MR. KATZ: Thank you, Mr. Decker. I think that is always important to keep in mind and that's what makes it really tough for the Board because we have all these host of sites with people in situations like yours. So we would hear the same concern from all the various sites that are on the Board's plate at a given time. That's what makes it tough.

CHAIRMAN POSTON: And I didn't want to sound callous but I'm trying to understand, are there people that need attention and what I heard was that at this point there are no additional petitioners. Is that right? Claimants?

MR. KATZ: There's one claimant,

in other words, who has been denied, right? Denied on a dose reconstruction, so this would be important if a Class was added. So it is important to at least one claimant right now.

DR. MAURO: But for the point of view of the granting the SEC status to the D&D period, that certainly could move forward.

MR. KATZ: That's already done.

DR. MAURO: Oh, that's a done deal?

MR. KATZ: No, that's done. The Board recommended --

DR. MAURO: Oh, okay.

MR. KATZ: That was already added.

DR. MAURO: Okay.

DR. NETON: I'm not sure that one claim -- I don't know how we can figure this out -- has 250 days.

MR. HINNEFELD: Yes, it does.

DR. NETON: It does?

MR. HINNEFELD: I was checking that. It also has a listed cancers.

MR. KATZ: So it's a claimant that would be affected by this decision?

DR. NETON: Two-hundred and fifty days at the Piqua reactor or 250 days --

MR. HINNEFELD: According to his employment on the cover page of his claim, he has about two years of employment. Well, it goes from somewhere in '61 to somewhere in '63. So he's got more than 250 days. He also has 20 years of employment at Idaho.

MR. KATZ: At Idaho. So this is a person, anyway, in Mr. Decker's shoes in effect.

DR. NETON: Even if there were zero, we could get a claim in tomorrow.

MR. KATZ: Right, right, right.

CHAIRMAN POSTON: Okay. So, we are going to put together an overall plan.

MR. HINNEFELD: We're putting together a list of stuff and here are the things we know we have to work on and let's sort out what order we want to do these in

now. It might be better to do it at the Board meeting as opposed to a phone call.

MR. KATZ: I don't think, well since we haven't even seen that yet, I'm assuming that will be more likely ready for the Board's working time during the Idaho meeting. I will actually list it there under the detailed items for the Board working time so we don't lose that.

CHAIRMAN POSTON: Well, I don't have anything else unless we are --

MR. KATZ: No.

CHAIRMAN POSTON: I would hope that we could meet by telephone next time. I was advised that we should always have a face-to-face meeting first, which we've had. Even though it's been basically two hours, it's still been useful. I appreciate everybody coming. Anything else we need to talk about? Jim?

DR. NETON: Not here.

CHAIRMAN POSTON: Anybody? Bill?

Phil?

MR. KATZ: Thank you, everybody.

CHAIRMAN POSTON: All right. Thank you very much.

MR. KATZ: And thank you everyone on the line.

(Whereupon, the above-entitled matter went off the record at 10:19 a.m.)