

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH

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ADVISORY BOARD ON RADIATION AND
WORKER HEALTH

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WORK GROUP ON PIQUA

+ + + + +

MONDAY
APRIL 11, 2011

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The Work Group convened via
teleconference at 9:30 a.m. Eastern Daylight
Time, John W. Poston, Chairman, presiding.

PRESENT:

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

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ALSO PRESENT:

TED KATZ, Designated Federal Official
ELIZABETH BRACKETT, ORAU Team
ROGER HALSEY, ORAU Team
KARIN JESSEN, ORAU Team
JENNY LIN, HHS
JOHN MAURO, SC&A
CHARLES NELSON, DCAS
JIM NETON, DCAS
ARIS PAPADOPOULOS, SC&A
GENE POTTER, ORAU Team
LAVON RUTHERFORD, DCAS
MUTTY SHARFI, ORAU Team
DAN STEMPFLEY, ORAU Team

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

2 9:30 a.m.

3 MR. KATZ: Okay. Let's get
4 started. It's time.

5 This is the Advisory Board on
6 Radiation and Worker Health Piqua Work Group.

7 We'll begin with roll call, beginning with
8 Board Members, with the Chair.

9 CHAIRMAN POSTON: John Poston, no
10 conflicts.

11 MR. KATZ: Thank you.

12 MEMBER FIELD: Bill Field.

13 MR. KATZ: Go ahead again, Bill
14 Field, and speak the conflict too, please.

15 MEMBER FIELD: No conflict.

16 MEMBER SCHOFIELD: Phil Schofield,
17 no conflict.

18 MR. KATZ: Very good. Do we have
19 any other Board Members on the line?

20 Okay. NIOSH-ORAU Team?

21 DR. NETON: This is Jim Neton,
22 NIOSH, no conflict.

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1 MR. NELSON: Charles Nelson,
2 NIOSH, no conflict.

3 MR. RUTHERFORD: LaVon Rutherford,
4 NIOSH, no conflict.

5 MR. SHARFI: Mutty Sharfi, ORAU
6 Team, no conflict.

7 MS. BRACKETT: Elizabeth Brackett,
8 ORAU Team, no conflict.

9 MS. JESSEN: Karin Jessen, ORAU
10 Team, no conflict.

11 MR. HALSEY: Roger Halsey, ORAU
12 Team, no conflict.

13 MR. POTTER: Gene Potter, ORAU
14 Team, no conflict.

15 MR. STEMPFLEY: Dan Stempfley,
16 ORAU Team, no conflict.

17 MR. KATZ: I'm sorry. Can you say
18 that again, the last one?

19 MR. STEMPFLEY: Dan Stempfley.

20 MR. KATZ: Dan Stempfley? Thank
21 you.

22 That's quite a crew.

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1 Is that it for NIOSH-ORAU?

2 Okay. SC&A Team?

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

5 MR. PAPADOPOULOS: Aris
6 Papadopoulos, SC&A, no conflict.

7 MR. KATZ: Okay. Other federal
8 officials, contractors for the Feds, HHS or
9 other agencies?

10 MS. LIN: This is Jenny --

11 MR. KATZ: Whoever that was, I
12 just caught the end of it.

13 MS. LIN: This is Jenny with HHS.

14 MR. KATZ: Jenny, hi.

15 Any others?

16 How about members of the public?

17 Any members of the public who want to identify
18 themselves?

19 Okay. John, it's your agenda.

20 CHAIRMAN POSTON: Thank you, Ted.

21 Basically, as I see the agenda, we
22 have two things to consider.

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1 First, the tritium and carbon-14
2 issue at the Piqua Organic Moderated Reactor.

3 The other is a recent document
4 that was March 3, 2011 on the neutron exposure
5 at the Piqua Reactor.

6 These were the two issues as far
7 as I could tell that were outstanding that we
8 needed to have more information on before we
9 could side or make a vote on whether or not to
10 accept NIOSH's recommendation that they could
11 reconstruct dose.

12 Without any order to this, I would
13 like to start with the tritium and carbon-14.

14 I know that Mr. Papadopoulos is on the line
15 and perhaps it would be good to have sort of a
16 summary of that review of the NIOSH document.

17 MR. PAPADOPOULOS: Okay. We did
18 respond in a paper the SC&A's response on
19 that.

20 Our final conclusion was that the
21 White Paper -- our response was that we agreed
22 with the NIOSH position on the volatility

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1 issues of tritium and carbon-14. We agreed
2 that it's technically defensible.

3 I heard about the teleconference
4 about half an hour ago. I don't have in front
5 of me the carbon-14 response or the issue.

6 But if I recall correctly, we
7 questioned the volatility of the tritium and
8 carbon-14 when at locations or when outside
9 when the coolant was exposed.

10 The response was the point for
11 which carbon-14 and H3 -- the point where the
12 coolant is solid is in room temperature.
13 Therefore, it does not release as gases the
14 carbon-14 and H3 into the airstream.

15 There was a technical presentation
16 in the paper in terms of those points. They
17 appear to be technically correct.

18 CHAIRMAN POSTON: I have a
19 question, perhaps for John Mauro.

20 John, the paper that I reviewed
21 was labeled draft and it's dated December 20
22 of last year.

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1 DR. MAURO: Okay.

2 CHAIRMAN POSTON: Has that been
3 approved? The paper I have wasn't approved by
4 Mr. Papadopoulos nor you, and I was just
5 wondering if that's --

6 DR. MAURO: What you have in your
7 hand, I can say that it has gone through
8 SC&A's review and approval.

9 Whether or not it has been
10 actually issued as a White Paper through Nancy
11 Johnson and is officially part of the record,
12 I'd have to check with Nancy. I've been
13 operating on the premise that it has because
14 it has gone through the SC&A's cycle. And the
15 summary that Aris just described is as I
16 recall it.

17 In fact, if I could add one more
18 point, I believe there was also -- not only
19 was it theoretically argued regarding the
20 solidification issue on the organics. But
21 also there is actually some empirical work, I
22 believe it was in Idaho, a reactor of a very

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1 similar nature which had data which confirmed
2 that the NIOSH strategy for estimating the
3 potential for airborne exposure was valid.

4 As far as this being officially
5 delivered, I could find out very quickly for
6 you by just checking with Nancy.

7 MR. KATZ: John, this is Ted. I
8 can speak to that. It was officially issued
9 through Nancy.

10 DR. MAURO: Very good.

11 MR. KATZ: Yes.

12 DR. MAURO: Excellent. So, yes.
13 That paper is in fact officially on the record
14 and it's SC&A's position that we find
15 favorably regarding NIOSH's position.

16 CHAIRMAN POSTON: I just wanted to
17 make sure that we checked all the boxes and so
18 forth here.

19 DR. MAURO: Sure.

20 CHAIRMAN POSTON: Any of the Board
21 Members, Bill or Phil, do you have questions
22 about the tritium and carbon-14 issue?

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1 MEMBER SCHOFIELD: No. I think
2 the White Paper covered it pretty good.

3 CHAIRMAN POSTON: Bill?

4 MEMBER FIELD: No. I didn't have
5 any problems. I thought it was fine.

6 CHAIRMAN POSTON: Any of the NIOSH
7 staff or no need to comment? Do you have
8 comments you want to make? I don't want to
9 leave you out.

10 DR. NETON: None here.

11 CHAIRMAN POSTON: Let's move on to
12 the next issue, which is the neutron exposure.

13 This was issued March 3 so it's
14 only about a month old. I don't know exactly
15 which would be the best way to approach this.

16 I'm at a little bit of a loss. I can't tell
17 whether this particular document -- I really
18 don't remember if this document is an SC&A
19 document. I think it is. Or is it a NIOSH
20 document?

21 DR. NETON: John, this was a NIOSH
22 document that was generated in response to one

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1 of the comments raised by SC&A.

2 CHAIRMAN POSTON: Okay.

3 DR. NETON: In fact, it was in
4 that paper that was just summarized. The only
5 outstanding issue that they identified there
6 was the neutron reconstruction.

7 CHAIRMAN POSTON: Would it be
8 appropriate then to have NIOSH give us a quick
9 summary of the paper?

10 DR. NETON: Yes. I think that's
11 appropriate.

12 CHAIRMAN POSTON: I have read it.
13 Whenever I read something I always put my
14 initials on it and check it so I know I read
15 it. But I'm sort of not functioning as well I
16 perhaps should be today.

17 Let's go on and discuss this
18 particular document.

19 MR. NELSON: Okay. This is
20 Charles Nelson. I can summarize the document.

21 Roger Halsey was also quite
22 involved in writing this. He can jump in as

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1 necessary.

2 Would you like me to give you a
3 detailed review or a cursory review?

4 CHAIRMAN POSTON: I mean, I've
5 certainly read it and I understood it. I'm an
6 old neutron dosimetrist myself.

7 Why don't you give us a summary?
8 And if Bill or Phil have questions, we'll go
9 to those first.

10 MR. NELSON: Okay. That's not a
11 problem.

12 Some of the areas SC&A was
13 concerned was the number of personnel
14 monitored, were they working in containment,
15 and what types of surveys do you have for the
16 neutron.

17 That's kind of what the approach
18 of the White Paper was, let's gather all the
19 neutron information we have, let's lay it out
20 and show everybody what exists, and based on
21 that do we have a good collection of evidence
22 to say that neutrons were minimal or really

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1 not an issue, which actually was our
2 conclusion.

3 As far as monitoring workers, what
4 we relied pretty heavily upon was interviews
5 with an HP technician, health physicists, and
6 workers. Without exception the result of
7 those interviews was that everybody wore
8 badges all the time.

9 The HP tech said that the folks in
10 the Auxiliary Building wore them and they were
11 exchanged monthly and quarterly. And he never
12 recalled anyone ever forgetting to wear their
13 badge. He said they used RWPs and a checklist
14 prior to going into the area. So they were
15 controlled, the workers going in there.

16 Also, we have the results of -- it
17 was actually in one of the case files. It was
18 an Atomics International employee. In looking
19 at his records, there was a summary of 31
20 Atomics International workers that worked in
21 there between the first two and a half years,
22 and it had their results. It showed that

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1 those folks were monitored.

2 Also the HP tech said not only
3 were Piqua workers monitored; Atomics
4 International people were monitored as well as
5 the AEC representative. He also went on to
6 say that they used NTA-type film.

7 As we've mentioned before in
8 previous Working Groups, we don't have the
9 actual results of the dosimetry. Those were
10 at Landauer and we have not been successful in
11 recovering those. But we do have AEC summary
12 reports for every year.

13 We corroborated -- lifted that
14 data and balanced it against one of the
15 reports that we have. Everything matches as
16 far as the doses that the workers received,
17 less than one rem annually for all the years
18 except for 1966.

19 Okay. That covers the monitoring
20 of workers. That was the first part of that.

21 The next theme, access to
22 containment. I looked at some of the

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1 transcripts from the first meeting and there
2 seemed to be maybe a little confusion about
3 where the containment was and all that type of
4 information. I'll kind of go over that.

5 Does everybody have in front of
6 them the Technical Basis, the White Paper for
7 the neutrons?

8 CHAIRMAN POSTON: I do.

9 MR. NELSON: It's kind of helpful
10 in looking at some of the pictures.

11 If you look at page 4, Figure 1,
12 that's a nice view of the reactor containment
13 dome. That would be to the right.

14 Then you'll see to the left of
15 that but in the center, that's the Auxiliary
16 Building. You see the mounded up dirt all the
17 way around.

18 Then to the left is the spec.

19 The reactor and the Auxiliary
20 Building together formed a single structure.
21 The Auxiliary Building had administrative
22 folks and below it had a filtration and

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1 exhaust system.

2 There was access between the
3 Auxiliary Building and the main containment.
4 That's considered the 100-foot level. That
5 was an airlock to get into that containment.

6 Then if you look at the next page,
7 Figure 2, that kind of gives you a good
8 cutaway drawing to show you the people in
9 there at the 100-foot level. That's above the
10 reactor floor.

11 The reactor is actually below all
12 of that and entombed in concrete, contained
13 within the lower section.

14 Then looking at one of the
15 documents we've referenced called Piqua
16 Nuclear Power Facility Operating Limits and
17 Controls was a 1965 Atomics International
18 document.

19 It stated no person shall enter
20 the reactor containment shelf during periods
21 when -- without first obtaining permission
22 from the shift leader. And the work would be

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1 controlled using a special work permit.

2 It also said in that document that
3 they found that radiation throughout the plant
4 was sufficiently low to prevent normal
5 operation and maintenance activities without
6 imposing time limits.

7 So people were actually in that
8 part of the containment periodically after
9 they verified all the exposure rates in those
10 areas. I think before there was some question
11 of whether people were in containment.

12 Now to talk a little about the
13 shielding, which becomes very important. If
14 you look at page 6, Figure 3, it has a nice
15 cross-section of the reactor as well as the
16 shielding that's involved.

17 Looking at that you'll notice that
18 there's a big what's called a bioshield on
19 each side of the reactor. It's 8 feet and, I
20 think, 4 inches -- 6. It's ordinary concrete.

21 Then within the reactor vessel
22 there's some other shielding, the thermal

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1 shield and that type.

2 Above the reactor --

3 MR. KATZ: I'm sorry, Chuck. I'm
4 sorry to interrupt.

5 Would everybody who is not
6 speaking please mute your phone? We're having
7 a lot of feedback or background noise. If you
8 don't have a mute button, hit *6. That will
9 mute your phone and *6 again will unmute your
10 phone.

11 Thank you.

12 MR. NELSON: Okay. As far as the
13 reactor goes, if you're going upward from the
14 reactor there is a reactor vessel head at 8
15 and a half inches of steel. That's a grid
16 lay-in, I guess, that would be below that at 8
17 inches. Above that there's 17 and a half feet
18 of organic coolant.

19 So if you look here and look at
20 all the shielding that's involved, there's
21 quite a bit of shielding to keep those
22 neutrons within the reactor core.

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1 So neutrons aren't an issue unless
2 the reactor is running. Then we have to look
3 at where the exposure points are.

4 Rather than me going through the
5 entire write-up here, the bottom line is they
6 did many surveys outside of the shielding of
7 the reactor. They did them at various levels
8 as they ramped up power, post-critical
9 operational tests.

10 We have several statements in the
11 Technical Basis White Paper that support that
12 no neutrons were located except for one
13 location. There are actually some coolant
14 lines that come out the bioshield.

15 This was found in the interviews
16 with the HP tech. We also found it in
17 progress reports. Everybody talks about the
18 one place where there were some neutrons.
19 They were recorded at less than 0.5 millirem
20 per hour. That was also stated by the HP
21 tech.

22 In fact, he said that that's the

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1 only location they ever found any neutron
2 unless they were doing a source check. He
3 said they have never had anybody assigned any
4 neutron dose and it was never found on their
5 film badge.

6 Those locations, like I've
7 mentioned, were in these pump rooms where
8 these coolant lines came out of this big
9 bioshield. There was associated gamma dose
10 rates with them.

11 If you look on page 8, which is
12 Table 1-2, that was taken right out of one of
13 the reports. What we're looking at is Item 11
14 and 12.

15 What it has is, for instance, Item
16 11 says 13.5. That's millirem per hour.
17 That's the photon exposure rate -- gamma
18 exposure rate with an associated less than 0.5
19 millirem per hour neutron. Right below that
20 it's 11 millirem per hour gamma and less than
21 0.5 millirem neutron.

22 Basically, we looked at those. We

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1 wanted to use those since that's really the
2 only information we have other than all these
3 other things that say, "No, we didn't find any
4 neutrons." This is the only good survey that
5 we have that shows anything about neutrons at
6 any level.

7 You can look at Items 1 and 3,
8 where it says no neutrons. This is the only,
9 I guess I'd say quantified number. But it
10 still shows less than 0.5 millirem per hour.

11 Looking at those numbers, that
12 results in about 3.8 percent or 4.5 percent
13 neutrons relative to gamma. We're assigning
14 10 percent or a one to ten ratio in the
15 Evaluation Report.

16 The technician used what he called
17 a Long John, which is a long counter. That's
18 a pretty good instrument for measuring
19 neutrons.

20 That's kind of a quick summary of
21 it. I can go into more detail if you want.
22 But hopefully that gives everybody an idea of

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1 what the White Paper was about and where we're
2 coming from.

3 CHAIRMAN POSTON: Any questions,
4 Bill, Phil?

5 MEMBER FIELD: Jim, this is Bill.

6 I just had a question about that
7 10 percent. Is that the customary ratio?

8 MR. NELSON: No. We went ahead
9 and did it as claimant-favorable number
10 because the highest -- we would have about --
11 4.5 percent was the highest that we found. We
12 believe it to be way less than that but that
13 was just the claimant-favorable number that we
14 found.

15 CHAIRMAN POSTON: Bill, I know
16 that you're always being admonished for using
17 surrogate data. But in my reactor experience,
18 the answer to your question is that is
19 typical. That's a reasonable assumption that
20 your data shows less but -- moderated
21 reactors -

22 Hello?

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1 MEMBER SCHOFIELD: Hello?

2 MEMBER FIELD: Hello?

3 CHAIRMAN POSTON: Bill, are you
4 there?

5 MEMBER FIELD: Yes, I'm here.

6 MEMBER SCHOFIELD: Yes, I'm here.

7 CHAIRMAN POSTON: Do you have any
8 questions, Phil?

9 MEMBER SCHOFIELD: No, I don't.
10 The White Paper seemed to answer most of the
11 questions I had.

12 CHAIRMAN POSTON: Okay. John, do
13 you or anybody in SC&A have comments?

14 DR. MAURO: Yes. Aris did have a
15 chance to look at it.

16 Aris, I think you actually put
17 something out on this too.

18 MR. PAPADOPOULOS: Yes. We have
19 prepared the response, the basic conclusion of
20 which -- I don't know at what stage it is
21 right now in terms of being official or not.
22 But anyway, it was out of my hands going to

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1 John and the rest of the processing.

2 Based on my cursory review of the
3 paper, we have concluded that the position is
4 technically defensible. And the paper's
5 extensive close look at the data shows that
6 there are no more concerns or uncertainty
7 issues related with neutron exposures.

8 We believe that the methodology
9 described in the Evaluation Report is bounding
10 and is claimant-favorable.

11 CHAIRMAN POSTON: Thank you very
12 much, Aris.

13 MR. PAPADOPOULOS: Sure.

14 CHAIRMAN POSTON: Again, just to
15 get it on the record but also to refresh my
16 memory, the recommendation of NIOSH was that
17 you believed that you could reconstruct doses
18 for these workers. That's correct?

19 MR. NELSON: That's correct. This
20 is the operational period.

21 MR. PAPADOPOULOS: During the
22 operational --

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1 CHAIRMAN POSTON: During the
2 operational period?

3 MR. NELSON: Yes. This is Charles
4 Nelson. That's January 1963 through May 1,
5 1966.

6 DR. NETON: There is already --
7 this is Jim Neton - a Class in the D&D phase.

8 CHAIRMAN POSTON: It's January
9 1963 through what, again?

10 MR. NELSON: May 1, 1966.

11 CHAIRMAN POSTON: Okay.

12 MR. NELSON: The proposed Class
13 goes from May 2, 1966 through February 28,
14 1969.

15 CHAIRMAN POSTON: Okay. So that's
16 already been added?

17 MR. NELSON: That's already been
18 added.

19 DR. NETON: That's correct.
20 That's an added plus.

21 CHAIRMAN POSTON: But we don't
22 have to consider that in this?

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1 MR. NELSON: No.

2 CHAIRMAN POSTON: All right.
3 Bill, I'll try to enunciate. Bill, do you
4 have any additional questions?

5 MEMBER FIELD: Yes. I just have a
6 couple maybe Jim could answer.

7 During this operational period
8 there were no reports of accidents or the
9 reactor operating above full power?

10 MR. NELSON: This is Charles
11 Nelson. No. I didn't see anything. I saw
12 that they went up to 100 percent of power but
13 no accidents or any exceedance of 100 percent.
14 I didn't see anything relative to that.

15 I mean, we asked in the interviews
16 about accidents and there were two issues
17 brought up, and we found them in reports. We
18 talked about them actually during the initial
19 presentation to the Board.

20 MEMBER FIELD: Right.

21 MR. NELSON: But that was, they
22 had a spill and this material went to near-

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1 room temperature. As soon as it gets below
2 300 degrees it solidifies into a wax. They
3 said they simply just scraped it up with a
4 flat shovel and it was no big deal, no
5 airborne, no contamination event whatsoever.

6 MEMBER FIELD: Right. But nothing
7 new since then?

8 MR. NELSON: No.

9 MEMBER FIELD: Okay. Thanks.
10 That's all I had.

11 CHAIRMAN POSTON: It seems that
12 it's appropriate that we have some sort of
13 motion. We've certainly discussed the issues.

14 I think it's inappropriate for the
15 Chair to make a motion so I'll turn it over to
16 one of you guys.

17 MEMBER FIELD: Yes. This is Bill.
18 I'm more than happy to make a motion to
19 accept the recommendation.

20 CHAIRMAN POSTON: Is there a
21 second?

22 MEMBER SCHOFIELD: I'll second

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1 that motion.

2 CHAIRMAN POSTON: Okay. Is there
3 additional discussion before we vote on this
4 motion? Certainly if there's any questions,
5 lingering questions or concerns, I want to
6 make sure that they're addressed while we have
7 everybody here.

8 Hearing none, I would ask Ted to
9 call for a swift vote.

10 MR. KATZ: Go ahead. There's
11 three of you, so one at a time.

12 MEMBER FIELD: This is Bill Field.
13 Yes.

14 MEMBER SCHOFIELD: This is Phil
15 Schofield. Yes.

16 CHAIRMAN POSTON: John Poston.
17 Yes.

18 MR. KATZ: And that would be
19 unanimous in favor of awarding the NIOSH
20 recommendation that dose reconstruction is
21 feasible for this Class.

22 CHAIRMAN POSTON: For January 1963

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1 through May 1966.

2 Ted, I have a procedural question
3 for you.

4 MR. KATZ: Yes?

5 CHAIRMAN POSTON: We have a
6 telephone meeting coming up. Should we report
7 then or should we wait until the next Board
8 meeting which is also coming up?

9 MR. KATZ: Let me settle that with
10 Dr. Melius as to whether he wants that to
11 happen during a teleconference. Generally we
12 like to keep these to the face-to-face Board
13 meetings. I don't know if this is an
14 exception or not.

15 CHAIRMAN POSTON: I didn't think
16 it was an exception but I was just wondering
17 what the procedure is.

18 MR. KATZ: Right. I would plan on
19 making a presentation to the full Board. At
20 this time I would just plan on doing that for
21 the May meeting unless you hear differently.
22 I'll get back to you very shortly on your

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1 question.

2 CHAIRMAN POSTON: Okay. That
3 makes me happy because you know my situation.

4 MR. KATZ: Yes.

5 CHAIRMAN POSTON: I may not be
6 available.

7 MR. KATZ: Then it's simple to
8 just keep it to May. I don't even need to
9 raise the question with Dr. Melius.

10 CHAIRMAN POSTON: All right. I
11 want to thank everybody for their hard work on
12 this, their professionalism, and so forth.
13 I'm glad that we were able to resolve these
14 issues and come to a unanimous agreement on
15 the path forward.

16 I appreciate SC&A, NIOSH,
17 everybody that's participated, and certainly
18 the two Work Group Members.

19 If there's no other questions,
20 comments, or statements, I think this meeting
21 should be adjourned.

22 Any other --

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1 MR. KATZ: No. Thank you, John.

2 And thank you everybody.

3 (Whereupon, at 9:59 a.m. the
4 meeting was concluded.)

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