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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

OFFICE OF SECRETARY
BOARD-MAKING AND
ADJUDICATIONS STAFF

In the Matter of)	
)	Docket No. 30-31373-CivP
CONAM INSPECTION, INC.)	
Itasca, Illinois)	ASLBP No. 98-735-01-CivP
)	
(Order Imposing Civil Monetary Penalty))	

NRC STAFF BRIEF RESPONDING TO LICENSING BOARD QUESTION
ON DEFINITION OF "WHOLE BODY DOSE"

BACKGROUND AND BOARD QUERY

On May 29, 1998, Conam Inspection, Inc. (Conam) filed a Motion "To Authorize Weighted Dose Calculations" (Motion). The reason for the Motion is that Conam's radiation consultant used "weighting factors" in calculating the radiation dose received by William Chastain on February 27, 1996 in Indianapolis, Indiana and in so doing arrived at a dose within NRC's regulatory limits. See the Motion at 2 which reads:

...Conam, on the other hand, has submitted to NRC Enforcement its expert's dose calculations that employ external dose weighting factors set forth in ICRP 26 and ANSI N13.41.

There is no regulatory authority for such a motion. For a materials licensee, such as Conam, to use weighting factors for an externally received radiation dose would require an amendment to Conam's license providing for an exemption from 10 C.F.R.

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Part 20 to use any weighting factor other than one.¹ See footnote 2 to the Table titled "Organ Weighting Factors" in 10 C.F.R. § 20.1003, Definitions. The Licensing Board is not the proper forum to entertain such an amendment nor is a Motion the proper vehicle to achieve an amendment to Conam's materials license. See also the Licensing Board's Memorandum and Order (Granting Request for Hearing and Scheduling Prehearing Conference) dated December 17, 1997, at 2 which iterates that the Board's jurisdiction is limited to adjudicating whether Conam is in violation of NRC regulations as alleged in the Order Imposing Civil Monetary Penalty dated November 5, 1997, and whether that Order should be sustained. Such adjudication does not encompass authority to process and amend Conam's materials license. Any amendment to Conam's license requesting an exemption from the requirements of 10 C.F.R. Part 20 must be filed in accord with 10 C.F.R. § 20.2301 which section specifically addresses exemptions. We also note that contrary to Conam's Motion quoted above, ICRP Publication 26 does not set forth "weighting factors" explicitly for use in determining external dose. We pass these matters for the moment.

As a part of the support for their Motion, Conam quotes from a deposition of Monte Paul Phillips taken on May 14, 1998, in Lisle, Illinois. Mr. Phillips was at that time the Chief of Materials Licensing Branch of the NRC's Lisle, Illinois office. The Motion sets forth pages 132 - 136 of Mr. Phillips' deposition.

¹Counsel for Conam was informed by Mr. Phillips at his deposition that to use a weighting factor other than one would require a licensing action. Phillips' Deposition May 14, 1998, at 143 through 149, pages attached hereto.

On June 4, 1998, the Licensing Board issued its Memorandum and Order (Telephone Conference Call, 6/2/98) (Order). Page 4 of that Order reads as follows, in part:

... [Conam's] motion refers to the deposition of Monte Phillips, Chief of Materials Inspection Branch 2 during the inspection. In particular, on page 13, paragraph 33 of the motion, the following Questions and Answers are cited:

Q. But aren't you calling the result that you're calculating for the thigh a whole body result?

A. I'm calling that a legal whole body value.

* * *

Q. So there's a discrepancy between the legal definition of whole body dose and the whole body dose--

A. What part of the body would actually get.

Q. Is that correct?

A. Yes,

Deposition of Monte Phillips, May 14, 1998, at 132-136, attached as Exhibit F to Conam's motion.

This dialogue appears to put a different emphasis on the weighting factors cited in 10 C.F.R. § 20.1004 than one would glean from the underlying technical publications, ICRP Publication 26. We request each of the parties, prior to the evidentiary hearing, to brief the Board on the distinction drawn by Mr. Phillips between the "legal definition of whole body dose and the whole body dose" and the relation of these two concepts to the dose determination recommendation in ICRP Publication 26. Such briefs should be filed (mailed) by Friday, August 21, 1998."

The Staff's response to the Licensing Board's inquiry follows. It is jointly sponsored by the Office of the General Counsel for its legal content and by the Office of Nuclear Material Safety and Safeguards for its factual content. The Licensing Board's

query is not without its own ambiguity. 10 C.F.R. § 20.1004 sets forth definitions of "Units of Radiation Dose" and is without any specific recommendations for the use of weighting factors for an external dose such as Mr. Chastain received. The Licensing Board's query is premised upon incorrect assumptions as there are no "weighting factors cited in 10 C.F.R. § 20.1004"²

STAFF RESPONSE

1. LEGAL DOSE

The term "whole body dose" is no longer proper. The proper term now is "Total Effective Dose Equivalent (TEDE)" as set forth in 10 C.F.R. § 20.1003. However, for the purpose of responding to the Board's inquiry, the difference in phraseology is not important, and thus the Staff's response will be couched in the language used by Mr. Phillips on May 14, 1998.

Mr. Phillips reference to "legal definition of whole body dose" is to a radiation dose calculated in conformity with the NRC Rules and Regulations as set forth in 10 C.F.R. Part 20 which definitively bind the NRC and all of its personnel and its licensees. That the NRC regulations definitively bind NRC and Licensee actions is simply well accepted *stare decisis* clearly first set forth in *Federal Crop Insurance Corporation v. Merrill*, 332 US 380, 68 S. Ct. 1 (1947). This rule of law has been

²We assume that the Board was referring to the weighting factors set forth in 10 C.F.R. § 20.1003.

directly applied to the Nuclear Regulatory Commission by the Court of Appeals for the District of Columbia in *Nader v. NRC*, 513 F.2d 1045 (1975) where, at 1051, the Court wrote:

To be sure, an administrative agency is bound not only by the precepts of its governing statute but also by those incorporated into its own regulations.

citing *Service v. Dulles*, 354 US 363, 1 L.Ed.2d 1403 (1957) and others³.

Of course the Atomic Energy Commission has recognized this principal in *In The Matter Of Baltimore Gas And Electric Company* (Calvert Cliffs Nuclear Power Plant), 4 AEC 243 (1969) where at 244 it stated:

Further, it should be clear that our licensing regulations-which are general in their application and which are considered and adopted in public rule making proceedings. . . - are not subject to amendment by boards in their adjudicatory proceedings.

2. WHOLE BODY DOSE

"Whole body dose" as something different from "legal whole body dose" as used by Mr. Phillips, is quite clear from the words of his deposition (see Phillips' Deposition page 133, line 18- page 134, line 14 which are quoted in Appendix X to Conam's Motion) and may be iterated again quite succinctly. It is quite possible for a part of the body, such as in Mr. Chastain's situation, his thigh, to receive a dose that is higher than the radiation dose received by other parts of the whole body. "Whole body" is defined in 10 C.F.R. § 20.1003 *for the purpose of external exposure*, as "the head, trunk (including male gonads), arms above the elbow, or legs above the knee," emphasis

³Staff Counsel provided this citation to Conam's Counsel in May 1998

supplied. In Mr. Chastain's situation his thigh was exposed and that exposure was attributed by NRC regulations as his whole body dose [Total Effective Dose Equivalent], even though his head and other body parts may not have received in fact the exact same radiation dose that his thigh received. It would not be unusual for one part of the body to receive a radiation dose that differed from that received by another part of the body, depending upon the source and shielding. The foregoing seems quite clearly explained by Mr. Phillips at his deposition on the pages cited *supra*.

In addition to the foregoing, the Statement of Considerations accompanying the final rule for Part 20 makes clear the NRC's position. It recognizes that the ICRP "permit the use of weighting factors without specific recommendations for the use of weighting factors for external dose." 56 Fed. Reg. 23369, May 21, 1998. The Statement goes on to state:

External doses to the head, trunk (including male gonads), arms above the elbow, or legs above the knee are to be treated as whole-body doses. For the purpose of weighting the external whole-body dose (for adding it to the internal dose), a single weighting factor, $W_T=1.0$, has been specified.

The use of other weighting factors for external exposure may be approved on a case-by case basis upon request to the NRC. 56 Fed Reg 23369, May 21, 1991.

The foregoing quotation from the Statement of Considerations confirms Mr. Phillip's comment that the NRC recognizes a dose to a part of the "Whole Body" as the "Whole Body Dose" and that this principle is legally binding upon the Staff and all licensees.

3. ICRP PUBLICATION 26.

The Board has inquired as to the relation of "legal whole body dose" and "[actual] whole body dose" to ICRP Publication 26, January 17, 1977. First, it should be clearly understood that ICRP Publication 26 is not relevant to the issues before this Licensing Board - only the NRC regulations, specifically 10 C.F.R. Part 20, are relevant to the matters before the Licensing Board. The Board did not specify the part of ICRP Publication 26 with which it was concerned. That publication does not, as previously stated herein, set forth a distinction between weighting factors for internal doses and separately for external doses. The Staff, assumes that the Board is referring to paragraph 183 of ICRP 26, and it is to this paragraph that the Staff responds. The NRC computation of an externally received dose does not permit the use of weighting factors other than one, while the ICRP publication 26 does and states

In accidents or suspected accidents, more detailed information should be sought on the distribution of absorbed dose, dose equivalent or contamination.

ICRP 26, paragraph 183.

In this we generally agree with this distinction drawn by Conam's counsel on page 2 of its Motion. We use the word "generally" because ICRP 26 does not itself set forth any weighting factors for an externally received radiation dose. The doses computed by Conam's consultant of 2.347 rems and 2.906 rems, Motion at 2, paragraph 2, employ weighting factors other than one and by law (NRC Regulations, Part 20) are not relevant to this proceeding.

There is another matter which should be addressed here. The Motion at 7, paragraph 16, states that the Berger analysis using weighting factors:

"was submitted [the NRC] for the purpose of showing that there was no violation of 10 C.F.R. § 20.1201(a)(1)(I). In so doing Conam believed that it was submitting Ms. Berger's weighting factors for 'approval' pursuant to footnote 2 to the 'weighting factor' definition in 10 C.F.R. § 20.1003."

This is a sophistry cannot pass without comment. Appendix D to the Conam Motion sets forth pages from the transcript of the enforcement conference. In regard to the Berger analysis which computes rems using weighting factors other than one, Mr. Slack, Radiation Safety Officer for Conam, handed the Berger analysis to NRC stating "I have that [Berger Report] available for you" (Tr. at 30 and 40) and as the conference ended, Mr. Slack stated "...I believe you folks should give consideration to it [Berger Report]...." (Tr. at 41). This is a bit too informal to qualify as a request for an amendment to Conam's materials license which is required to be filed in conformity with 10 CFR § 20.2301.⁴ The statement in Conam's Motion must also be considered *in para materia* with Mr. Slack's statement made under oath at his deposition taken on May 13, 1998, where he stated that he, Robert Slack, had not requested approval from the NRC to use weighting factors to calculate the dose received by Mr. Chastain. (Tr. at 62, page attached hereto as Exhibit 1). The NRC did consider the consultant's use of weighting factors in its Order Imposing Civil Monetary Penalty-\$16,000.00", dated November 5, 1997. See Appendix A pages 2 through 6.

⁴See also 10 C.F.R §§ 30.38 and 30.32

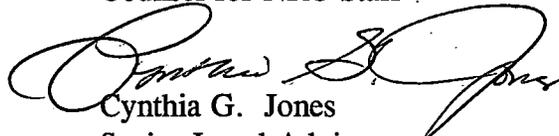
CONCLUSIONS

In summary, Mr. Phillips' "legal dose" [Total Effective Dose Equivalent] is a dose calculated in conformity with 10 C.F.R. Part 20. The actual whole body dose may be different than the maximum dose received by a part of the "whole body" as defined in 10 C.F.R. § 20.1004. The ICRP Publication 26 in effect, although not specifically, recognizes the use of weighting factors in calculating an external radiation dose while the NRC Rules and Regulations do not.

Respectfully Submitted,



Charles A. Barth
Counsel for NRC Staff



Cynthia G. Jones
Senior Level Advisor
for Health Physics

Dated at Rockville, Maryland
this 20th day of August 1998

1 instruction that is given, when one indicates that you
2 should perform a survey of the camera and the guide tube,
3 primarily the guide tube should be surveyed from one end to
4 the other, as best an individual can do, that would allow
5 him to assure that the source was either not in the tube or
6 -- I'm sorry -- not some place in the tube.

7 BY MR. BARTH:

8 Q Mr. Slack, has Conam, by that I mean you,
9 requested approval from the NRC to use external weighing
10 factors to calculate the dose Mr. Chastain received?

11 A To my knowledge, no.

12 Q Also to the best of your knowledge had the NRC, in
13 regard to the Chastain incident, ever approved the use of
14 external weighing factors to this date?

15 A In Mr. Chastain's case, to my knowledge, no.

16 [Discussion off the record.]

17 BY MR. BARTH:

18 Q Mr. Slack, I hand you a document dated July 7th,
19 1997 which is a letter to the NRC to James Lieberman signed
20 by counsel Clifton A. Lake. I ask you to take a look at it,
21 please, and ask the reporter to mark that as Government
22 Exhibit Number 6.

23 MR. BARTH: Do you have a copy?

24 MR. BROOKS: I do.

25 [Government Exhibit 6 was marked

1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

3 - - - - -x

4 In the Matter of: :

5 DEPOSITION OF :

6 MONTE PAUL PHILLIPS :

7 (CLOSED) :

8 - - - - -x

9 U.S. Nuclear Regulatory Commission

10 Region III

11 801 Warrenville Road

12 Lisle, Illinois 60532-4351

13 Thursday, May 14, 1998

14
15 The above-entitled matter came on for
16 continued deposition, pursuant to notice, at 9:15 a.m.

17 BEFORE:

18 CHARLES BARTH, Investigator

19 APPEARANCES:

20 On Behalf of the Nuclear Regulatory Commission:

21 MR. DENNIS C. DAMBLY,

22 Deputy Assistant General Counsel

23 Office of the General Counsel

24 U. S. Nuclear Regulatory Commission

25 Washington, D.C. 20555

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1 seems to prevail.

2 BY MR. BROOKS:

3 Q If the dose that Mr. Chastain received was as
4 you've calculated at 6.6 REM, how serious a violation would
5 you characterize that?

6 A That would per our policy be a straight Level 3.

7 Q What makes the severity level three?

8 A The fact that it's greater than five and less
9 then, I believe, ten. I don't have it -- do you have a copy
10 of the enforcement policy here?

11 Q I don't have it in front of me but I have a copy
12 of it.

13 A It works in multipliers. I want to say two times
14 the five times is a two and five times above would be a one.
15 But I cannot remember off the top of my head if it's two
16 times or three times is that multiplier that gets you into
17 two space.

18 I know it's greater than five times your one space
19 because I just did one of those about a year ago.

20 Q I'm sorry, I didn't understand that.

21 A Greater than five times, the limit is one,
22 variable one. But I can't remember.

23 Q Have you seen a report calculation prepared by
24 Carol Burger for Conam in this matter?

25 A Yes, I did, a long time ago.

1 Q What was the occasion for your reviewing that
2 report?

3 A The Enforcement Panel or conference I believe, it
4 came just before the conference and I know it was presented
5 at the conference.

6 Q Did you draw any conclusions or form any opinions
7 as a result of viewing Ms. Burger's calculations?

8 A Yes, as a matter of fact I did. I concluded that
9 our enforcement was right on because her calculations would
10 support in both cases our severity level would be assigned.

11 Q In what way?

12 A Her calculation, I got it in front of me, is that
13 one of your policy that I can look at by any chance.

14 Q I don't think it is.

15 A But if my memory serves me right , she had a
16 dose calculation using our re-enactment and as she put it,
17 the licensee's re-enactment. And in the licensee's
18 re-enactment even in that re-enactment there was a dose, I
19 believe, to the thigh that was greater than 5 REM or less
20 than ten. I can't remember. I want to say nine but I'm
21 just pulling that out of a hat.

22 Q Can you --

23 A And that was support from our definition of whole
24 body, again, a violation -- in three space.

25 Q You don't recall that Carol Burger employed

1 a --

2 A Yes, she did but I threw that out because our
3 regulations don't allow that except on a case specific basis
4 pre-approved by the NRC which didn't exist here. As a
5 matter of fact -- I don't believe we ever looked at that.

6 Q Why not?

7 A I can't give you that because I'm not the one who
8 gets to do the approvals. That all goes to headquarters and
9 they make the decisions.

10 Q Now the --

11 A You will, I think eventually somebody is going to
12 probably apply and who knows, but so far anybody's who's
13 applied, I don't know if any of them have been approved yet.

14 Q Are there applications under consideration
15 currently?

16 A I wouldn't know. Because they wouldn't come to
17 me.

18 Q There are regulations though or a regulation that
19 defines waiting, is that correct?

20 A In the footnotes it says you can do waiting
21 factors if it's been pre-approved by the NRC but only if
22 it's been pre-approved.

23 Q Did you have any role in creating that footnote?

24 A Excuse me, no, I did not. Again, I don't know who
25 did.

1 Q Do you know under what circumstances waiting could
2 be or would be approved?

3 A No, because I wouldn't be the authority that would
4 be able to approve it. And by the way I'm not speaking in
5 my current job which is as a licensing person, because it
6 would, if Conam for example wanted to have that waiting
7 factor, they would actually send their application to me.
8 We would then take that application and forward it on to
9 headquarters, MNSS for them to do the review and determine
10 whether it was acceptable and they then would come back to
11 us and say, we approve or disapprove. And if they approve,
12 they would tell us how to write the license condition then
13 we would then send to Conam, in their license that would
14 either approve what approved or disapproved or just say it's
15 disapproved, that would be the end of it.

16 Q Why did you do that in the matter of licensing
17 rather than a strategy for dose calculations?

18 A Because it does say pre-approval. And that
19 implies you have to gun the NRC, that's a licensing
20 function.

21 Q Where does it say, pre-approved?

22 A I believe you have to, in the footnote itself.

23 MR. BROOKS: You don't have your CFR here, do you?

24 MR. YOUNG: Yeah, I'll get it.

25 THE WITNESS: I'm now hunting for the footnote.

1 There's one footnote but it's not the right footnote.

2 MR. BROOKS: 2103.

3 THE WITNESS: I'm working my way back but I'll
4 take your word for it, so I'll turn back another page, real
5 quick.

6 MR. BROOKS: Don't take my word for it.

7 MR. YOUNG: It's in the definition's line.

8 THE WITNESS: Is that where it is? Is that where
9 the footnote is in the definitions?

10 MR. YOUNG: Under waiting factors.

11 MR. BROOKS: Just for the record, we're looking at
12 Part 20 of CFR, specifically, Section 20.1003.

13 THE WITNESS: Right, here we are.

14 MR. BARTH: Mr. Phillips, please, could you
15 identify the year for the folks so --

16 THE WITNESS: Yeah, sure.

17 MR. BARTH: -- they come out every darn year.

18 MR. YOUNG: Yeah, this one is revised as of
19 January 1st, 1997.

20 MR. BROOKS: And just for the record --

21 THE WITNESS: It's under waiting factors, it's
22 Footnote 2.

23 MR. BROOKS: Okay. And can you read that.

24 THE WITNESS: And what it says, it's for the
25 purpose of waiting the external whole body dose. For any

1 internal dose, a single waiting factor of 1.0 has been
2 specified. The use of other waiting factors for external
3 exposure will be approved on a case by case basis until such
4 time as specific guidance is issued.

5 BY MR. BROOKS:

6 Q So there's nothing there that requires
7 pre-approval?

8 A Well, technically that's what it means by a
9 case by case basis, and gee, a case by case will be an
10 individual licensee, your license or my license or
11 somebody's else's license wants to use different waiting
12 factors they come to the NRC and say, this is the approach
13 that we'd like to use.

14 Q Well, is there anything in that footnote that
15 indicates to you that it's a licensing matter rather than
16 case by case referring to instance by an instance, if the
17 need arises?

18 A In the footnote itself?

19 Q Yes.

20 A Not it's not that clear, unfortunately.

21 Q Is there anything else that you know of other than
22 the footnote that indicates that it's a licensing matter
23 rather than something to be considered on a matter by matter
24 basis --

25 A I've been told by our headquarters office.

1 Q Has anybody in your headquarters office told you
2 why they believe there's a pre-approval requirement?

3 A Why there's a pre-approval requirement? No, I
4 haven't got the why. You need to talk to the headquarters
5 types to know the answer to that one.

6 Q Who in headquarters told you that pre-approval was
7 going to be required and that it was a licensing matter?

8 MR. BARTH: I do object. That assumes facts not
9 in the record, without a foundation --

10 MR. BROOKS: It's a fair objection, let me back
11 up.

12 BY MR. BROOKS:

13 Q You said you were told something by somebody in
14 headquarters, what was it that somebody in headquarters told
15 you?

16 A Basically, we were told, when I say we, I mean
17 licensing, because we're the licensing entity, okay. That
18 we're not authorized to make those kinds of decisions or
19 approvals without having headquarters basically do the
20 reviews and approvals.

21 Q Who told you that?

22 A That came from, actually Fred Combs's staff.

23 Q Could you spell his last name.

24 A C-o-m-b-s. It's considered to be an exemption.

25 And by definition, we're not allowed to process any

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
CONAM INSPECTION, INC.)
Itasca, Illinois)
)
(Order Imposing Civil Monetary Penalty))

OFFICE OF SECRETARY
RULEMAKING AND
ADJUDICATIONS STAFF
Docket No. 30-31373-CivP
ASLBP No. 98-735-01-CivP

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF BRIEF RESPONDING TO LICENSING BOARD QUESTION ON DEFINITION OF 'WHOLE BODY DOSE'" in the above-captioned proceedings have been served on the following by deposit in the United States mail, first class; or as indicated by an asterisk, through deposit in the Nuclear Regulatory Commission's internal mail system this 20th day of August 1998.

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