

In contrast, Ndubizu at 234 equation 1, equates the rate of flow of fuel into the fire as the fuel evaporation rate m_v . The portion of the fuel which actually burns is a fraction of the evaporation rate as shown in equation 4, **Id.** at 235. This leads to the conclusion that Ndubizu's model requires that the rate of fuel combustion must be equal to or less than the evaporation rate. This result also negates Applicant's definition of the burn rate as emphasized above.

Again, the result of CD 2.35 is a **confirmation** of the Board's doubts regarding the competency and credibility of the Applicant's evidence in support of its application. In this instant, Applicant not only misquotes Applicant's reference, but also misquotes Applicant's own CD .97. The question arises, is there any other way to interpret Applicant's actions other than the conclusion that Applicant has purposefully tried to mislead the Board with false statements?

3. Conclusions Regarding the Competency and Credibility of Information in CD 2.35

After careful consideration of CD 2.35, it is concluded that it is flawed with the same types of errors and misrepresentations as were already observed in CD .97, and CD 2.30. Other points could be made about the inadequacies of CD 2.35 but there is no need to proceed further in its review.

In conclusion, CD 2.35 only serves to confirm the previous Board doubts about the competency and credibility of Applicant's evidence in support of its application.

L. MARCH 23, 1994 BOARD MEETING

Of critical importance to the Board's decision are the March 23, 1994 Board meeting discussions set forth below.

DR. PINTO: ... One of the problems I had was with your claimed residence time calculation. . . . You imposed a condition . . . that the heat transfer coefficients were equal in the flame and in the surrounding region, and then you had an explanation for that in document 230, which doesn't convince me for the following reason:

If we apply the condition at steady state which is what you have in your flame, you don't have time dependent condition, at steady state, the flux out of the flame of energy must be equal to the flux that is entering the environment.

If we apply ... your condition that the two heat transfer coefficients are the same, that implies that the temperature gradient in the two regions are the same; therefore, if the temperature gradient in the flame is zero, the temperature gradient in the surrounding air is zero, which is not acceptable in my mind.

The only other condition that you could have is that the flux from the flame is zero. Those are the only two conditions that can satisfy that requirement. In other words, . . . it's violating the first law of thermodynamics. Could you respond to that?

MS. FOSTER²⁶: *I can not directly respond to that.* I guess I -- there are legitimate -- I understand what you're saying, and what I'm trying to say is that there are legitimate areas of uncertainty in modeling this type of situation and --

DR. PINTO: There's no uncertainty in the first law of thermodynamics though.

MS. FOSTER: I understand what you're saying.

²⁶Sarah Foster, previously employed by Clement Engineering Corporation, was the project manager for the Southdown risk assessment.

DR. PINTO: And that is the basic principle that you're applying to your calculations, and that's what concerns me, is the people that checked these calculations should have been aware of this.

MS. FOSTER: The people that developed this methodology and responded to the comments is the person that needs to respond to your question.

DR. PINTO: But the response that was provided I guess was not adequate is what I'm saying. Are you accepting that as an incorrect calculation is what I want to know?

* * *

MS. FOSTER: I'm accepting that the flame temperature that was used in calculating the k values was not adequately discussed, because we used 1000 °k as opposed to 2108 °k.

I'm accepting that the flame height could differ from what we estimated, and I'm accepting that the DREs may and will differ from what we've estimated. I'm accepting that the result of our calculations is at best going to be within an order of magnitude.

DR. PINTO: My point is slightly different, and this is what I want you to respond to. ***There are certain fundamental engineering assumptions that have been made in those calculations that are independent of the sophistication of the knowledge in these types of calculations. These are well-known principles. There are errors in applying these principles.***

MS. FOSTER: ***I can't answer that because that's not my area of specialization. ... I would like an opportunity -- I can't answer that specific question. I keep coming back to what if, what if.*** I don't think that the analysis is not credible overall in this risk assessment.

DR. PINTO: That's not what I'm addressing. I'm addressing the technical competence of the staff that did these calculations and therefore the technical competence of the staff at Southdown as well to check the calculations or at least review them.

I'm not sure if I should continue with other specific questions that I do have with regard, for example, ***to the fact that you have an inconsistent temperature in the calculation, which you admitted, and again, to me any good engineering solution***

requires that you have internal consistencies. There are no consistencies in the temperature, and there are no consistencies in the material balances.

MS. FOSTER: *Well, the bum rate issue, the bum rate is the bum rate --* mass bum rate of the entire material burned. The evaporation rates that were calculated were for a specific subset of POHCs and two products of combustion.

DR. PINTO: That's correct.

MS. FOSTER: You wouldn't expect the evaporation rate of those specific constituents in the waste fuel to add up to the bum rate that was calculated for the material as a whole.

DR. PINTO: Well, the people who checked these calculations in my opinion should have seen that one part of the calculation -- it's the same flame. One part of the calculation used a stoichiometric ratio, the other did not. That to me is an inconsistency in the material balance of the solution.

*The people who were doing the calculations should have caught **that**, but I can accept errors at **that** point, but the organization should have had a mechanism in place that would catch errors of that type.*

(Emphasis added.)

Tr. at 96 -101.

From the above discussion:

1. As to Dr. Pinto's question of whether the information contained in the risk assessments violated the first law of thermodynamics, Applicant responds: "I can not directly respond to that."
2. As to Dr. Pinto's statement that the risk assessments contain errors in applying certain fundamental engineering assumptions, Applicant responds: "I can't answer that because that's not my area of specialization. . . . I would like an opportunity -- I can't answer that specific question. I keep coming back to what if, what if."
3. As to Dr. Pinto's statement that the risk assessments contain inconsistent temperature calculation, which have been admitted, and that any good engineering

solution requires that you have internal consistencies, Applicant responds: "Well, the bum rate issue, the bum rate is the bum rate."

4. As to Dr. Pinto's statement that the people who were doing the calculations should have caught the inconsistencies and that the organization should have had a mechanism in place that would catch errors of that type, Applicant did *not* respond.

The underlying theme to Applicant's response seems to be "Don't ask me, I don't know."

Attention is further directed to discussion between Applicant's chosen contractor and Dr. Bair regarding deficiencies in Applicant's quality assurance / quality control ("QA/QC") program:

DR. BAIR²⁷: Are there steps taken to confirm, review or *verify calculations* by a separate group within your company so *that the people who are working on Southdown don't perform the review or the confirmation, and is that part of the QA/QC process you discussed?*

MS. FOSTER: The QA/QC process really involve two different aspects. One was a verification of calculations performed by Staff who did not perform the calculations. The other was an executive level review by a senior scientist to review the substantive and technical quantity of the report as a whole, in addition to its pieces.

The **fire** scenario, I do not disagree that this is probably one of the most uncertain areas of quantitative risk assessment modeling that currently exists today.

There's a lot of research that needs to be done in this area. We're actually going to be presenting a paper with an analysis we performed for a subsequent risk analysis that, in fact, is really more of a call for research. There are many areas of uncertainty involved in modeling these types of scenarios.

But in getting back to what you asked, there's two levels of review. *There's no independent body that is assigned to review the document that did not perform it*

²⁷Board Member geologist from a state university.

completely separately.

On occasion a project may choose to have a peer review body, an outside peer review body, *but there was none for this project.*

DR. BAIR: Is it reviewed by Southdown after they receive it from you?

MS. FOSTER: Yes, it is.

DR. BAIR: Is it verified? Let's not use the word review. Is it confirmed and verified?

MS. FOSTER: You mean who checks the calculation?

DR. BAIR: Yes.

MS. FOSTER: Besides the QA/QC within the risk assessment corporation?

DR. BAIR: Yes.

MS. FOSTER: I don't believe anybody else checks the calculations.

DR. BAIR: Does anyone within Southdown do that?

MR. SADOWSKI²⁸: I'd like to speak to that. Southdown did conduct reviews of draft documents of the risk assessment; however, **the** primary reason for employing a consultant with the type of technical expertise that they possess is because we *don't possess that technical expertise.*

So to the extent that we can review the document and detect any errors or **miscommunications** or misstatements, we did so, *but we do not have the expertise in-house to conduct the type of detailed verification process of the complexity, of the level that they are dealing with.*

(Emphasis added.)

Id. 91 - 94.

From the above discussion:

²⁸Director of Compliance for Southdown, Incorporated.

1. As to Dr. Bair's question of whether there is a procedure in place so that the QA/QC function is performed by persons not involved in the Southdown project, Applicant responds that:

there's no independent body that is assigned to review the document that did not perform it completely separately. **On occasion, a project may choose to have a peer review body, an outside peer review body, but there was none for this project.**

2. As to Dr. Bair's question regarding the scope of Southdown's review of the risk assessment, Applicant responds that: "we do not have the expertise in-house to conduct the type of detailed verification process of the complexity, of the level that they are dealing with."

We learn from this discussion that the Southdown project was an occasion where the contractor should have chosen to have outside peer review.

M. DISCUSSION OF PROCEDURE AND ACTION

1. Record As Exclusive Basis Of Decision

O.A.C. 3745-1-50(B) provides that:

the **record**²⁹ shall be the exclusive basis for decision by the Board. After the filing of the report of the hearing examiner, the board, upon its own motion or the motion of a party, may permit the parties to introduce further documentary evidence, or, after granting an opportunity to any opposing party for preparation,

²⁹The record include-s 'all testimony, . . . oral statements, oral argument, . . . written statements, . . . transcript of the public hearing . . . the report of the hearing examiner to the Board, the parties objections to such report, and such other documents or information as may be accepted into the record by the Board.' O.A.C. 3745-1-50(A).

may take additional testimony or remand the matter to the hearing examiner for the taking of additional testimony.

As stated *supra*, the Board through its staff undertook an independent, rigorous examination and evaluation (including verification) of Applicant's risk assessments. This risk assessment, regardless of whatever reason or motive Applicant may have had for its submittal, or whatever name is attached, is part of the record of this proceeding^{30,31} and a appropriate subject for Board review. It is properly assumed that the document was submitted into the record of this proceeding by Applicant in support of its application, and if said document and discussions in

³⁰Applicant states that:

(It should be noted that Southdown's risk assessment was prepared at the request of the Regional Air Pollution Control Agency (RAPCA) in conjunction with the air permitting process for Southdown's kiln. Southdown submitted the risk assessment into the record in this proceeding in response to public comment at a public hearing on March 19, 1992. In this proceeding, the risk assessment has been taken out of context and not used for its intended purpose.

CD 2.35 at 3.

“At the March, 1992 public hearing the presiding officer announced:

Ohio law requires that a representative of the applicant who has knowledge of the location, construction, operation, and closure of the facility attend this public hearing in order that they may respond to questions concerning the facility directed to them by the presiding officer. . . .

If you [persons in attendance at the hearing] have any questions regarding the application to which you desire a response from the applicant, . . . please state them to me when you give your presentation, and I will direct them to the applicant.

Southwestern Portland Cement will be held accountable for their responses provided here today. If they so indicate, the applicant may request to respond to certain questions in a written form. (Emphasis added.)

CD .80 at 5.