From: Mohseni, Aby
Sent: Tuesday, November 24, 2015 1:44 PM
To: Mark Leyse
Cc: Inverso, Tara; Kokajko, Lawrence; Burnell, Scott; Doyle, Daniel
Subject: RE: Fwd: Status of PRM-50-93/95

Mr. Leyse,

Your questions and comments have been forwarded to the staff reviewing the petition and will be taken into consideration. We appreciate your patience as the NRC's completes the evaluation of your petitions and the related comments. A full response to your rulemaking requests must wait until the NRC's evaluation is complete; please consider the following information to be preliminary. The staff's review of the completed simulation shows the cladding and steam temperatures at the 7-ft elevation (at 18 seconds) are as follows.

No MWR: Tcladding = 1446 K Tsteam = 1313 K
CP: Tcladding = 1526 K Tsteam = 1370 K
BJ: Tcladding = 1561 K Tsteam = 1397 K

The NRC's findings on PRM-50-93/95 issues will not be final until the NRC publishes a notice of final action on this petition for rulemaking in the Federal Register. Your email will be placed in ADAMS as requested.

Respectfully,

Aby Mohseni

Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

From: Mark Leyse [mailto:markleyse@gmail.com]
Sent: Sunday, November 22, 2015 8:10 AM
To: Mohseni, Aby <Aby.Mohseni@nrc.gov>
Subject: [External_Sender] Fwd: Status of PRM-50-93/95

Dear Mr. Mohseni:

I am forwarding you the e-mail that I sent you on November 9, 2015. As of this date, you have neither replied to my November 9, 2015 e-mail nor answered the two simple questions I asked you in that e-mail.

These are the two questions that I asked you on November 9, 2015:

First) Would you please acknowledge that the NRC's TRACE simulation of FLECHT Run 9573 did **not** predict what cladding temperatures would be at the test bundle's **7 foot elevation** at either 18 seconds or 18.2 seconds?

Second) Would you please acknowledge that the NRC's TRACE simulation of FLECHT Run 9573 did **not** predict what steam temperatures would be around the test bundle's **7 foot elevation** at either at 16 seconds, 18 seconds, or 18.2 seconds?

I would appreciate it if you would answer my two questions. Background information related to my questions is in the November 9, 2015 e-mail that I have forwarded.

In an October 22, 2015 e-mail to Daniel Doyle of the NRC, David Lochbaum of Union of Concerned Scientists stated: "The information requested by Mr. Leyse seems entirely on par with the information exchanged between NRC and NEI --- yet NRC declines to provide Mr. Leyse that which it freely and readily provided NEI." Mr. Lochbaum's entire e-mail is copied in the forwarded November 9, 2015 e-mail.

I believe the message of Mr. Lochbaum's e-mail also applies to the two simple questions that I asked you on November 9, 2015. Please answer those questions.

And please place this e-mail in ADAMS.

Thank you,

Mark Leyse

---------- Forwarded message ----------
From: **Mark Leyse** <markleyse@gmail.com>
Date: Mon, Nov 9, 2015 at 11:55 PM
Subject: Re: Status of PRM-50-93/95
To: "Mohseni, Aby" <Aby.Mohseni@nrc.gov>
Cc: "Gilles, Nanette" <Nanette.Gilles@nrc.gov>, johari.moore@nrc.gov, Patrick.Castlernan@nrc.gov, Alan.Frazier@nrc.gov, amy.cubbage@nrc.gov, Tamara.Bloomer@nrc.gov, robert.krsek@nrc.gov, "bobleyse@aol.com" <bobleyse@aol.com>, "shadis@prexar.com" <shadis@prexar.com>, "Burnell, Scott" <Scott.Burnell@nrc.gov>, "Bladey, Cindy" <Cindy.Bladey@nrc.gov>, "DeJesus, Anthony" <Anthony.DeJesus@nrc.gov>, "Inverso, Tara" <Tara.Inverso@nrc.gov>, "dlochbaum@ucsusa.org" <dlochbaum@ucsusa.org>, "elyman@ucsusa.org" <elyman@ucsusa.org>, "michal_freedhoff@markey.senate.gov" <michal_freedhoff@markey.senate.gov>, "mmckinzie@nrdc.org" <mmckinzie@nrdc.org>, "tcochran@nrdc.org" <tcochran@nrdc.org>, "gfettus@nrdc.org" <gfettus@nrdc.org>, "balemayehu@nrdc.org" <balemayehu@nrdc.org>, "DBrancato@riverkeeper.org" <DBrancato@riverkeeper.org>, "PGallay@riverkeeper.org" <PGallay@riverkeeper.org>, "Dean, Bill" <Bill.Dean@nrc.gov>, "Johnson, Michael" <Michael.Johnson@nrc.gov>, "jim.riccio@greenpeace.org" <jim.riccio@greenpeace.org>, "Doyle, Daniel" <Daniel.Doyle@nrc.gov>, Raeann.Shane@nrc.gov, Michael.Weber@nrc.gov, Paul Gunter

<paul@beyondnuclear.org>, Rulemaking Comments <rulemaking.comments@nrc.gov>, PDR Resource <pdr.resource@nrc.gov>, Diane Curran <dcurran@harmoncurran.com>, Richard Webster <rwebster@publicjustice.net>, Clay Turnbull <necnp@necnp.org>, Chairman@nrc.gov

Dear Mr. Mohseni:

Thank you for your reply. I appreciate your pointing out that the NRC has already acknowledged the existence of the severe-damage zone in the test bundle from FLECHT Run 9573, which Westinghouse reported. I should have noticed that the NRC mentioned the severe-damage zone on page 4 of the October 2012 Draft Interim Review.

On page 4 of the October 2012 Draft Interim Review, the NRC stated:

"During this test [FLECHT Run 9573] there were numerous heater element failures as temperatures exceeded 2200 degrees F. A post-test inspection of the bundle found there to be severe local damage near a Zircaloy spacer grid at the 7-ft elevation due to temperatures in excess of 2500 degrees F. Several possible causes of the high temperatures were cited, with metal-water reaction of Zircaloy being a likely candidate (Cadek et al., 1971)."

(A reference to the October 2012 Draft Interim Review is below.)

Now it's nice that the NRC mentioned the severe-damage zone; however, it's a problem that the NRC said "there were numerous heater element failures as temperatures exceeded 2200 degrees F." Westinghouse did **NOT** report that there were heater element failures **AS** temperatures exceeded 2200°F.

Westinghouse reported: "At the time of the initial failures, midplane [at the 6 foot elevation] clad temperatures were in the range of 2200 - 2300°F." But Westinghouse explicitly stated that "[t]he heater rod failures were apparently caused by localized temperatures in excess of 2500°F."

The heater rod failures occurred around the 7 foot elevation, which had cladding temperatures **in excess of 2500°F**. Who knows how high the cladding temperatures actually were; they could have been hundreds of degrees higher than 2500°F. At the time of the heater failures, cladding temperatures were **between 2200 and 2300°F at the 6 foot elevation**.

Please direct the NRC Staff members reviewing PRM-50-93 and PRM-50-95 to clarify that cladding temperatures of 2200°F or just above 2200°F did **NOT** cause the heater rods to fail. Please direct them to explicitly state what Westinghouse reported--that apparently cladding temperatures **in excess of 2500°F** caused the heater rod failures.

For the record here are two quotes from Westinghouse's WCAP-7665 (page 3.97):

First quote) "Post-test bundle inspection indicated a locally severe damage zone within approximately ±8 inches of a Zircaloy grid at the 7 ft elevation. The heater rod failures were apparently caused by localized temperatures in excess of 2500°F."

Second quote) "During the test, heater element failures started at 18.2 seconds... At the time of the initial failures, midplane [at the 6 foot elevation] clad temperatures were in the range of 2200 - 2300°F. The only prior indication of excessive temperatures was provided by the 7 ft steam probe, which exceeded 2500°F at 16 seconds (2 seconds prior to start of heater element failure)."

(A reference to WCAP-7665 is below.)

With all due respect, Mr. Mohseni, I do not understand why you answered one of my questions, yet not the other. The unanswered question is simple and pertinent to work the NRC has already completed for its draft interim review.

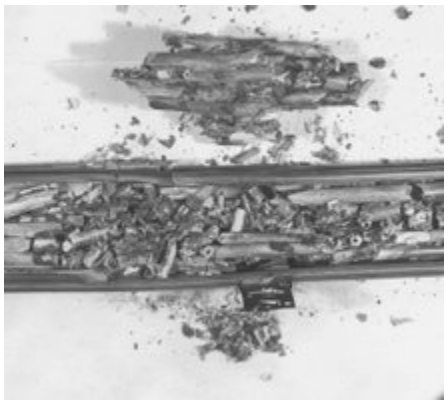
Please answer the following two related questions:

First) Would you please acknowledge that the NRC's TRACE simulation of FLECHT Run 9573 did **not** predict what cladding temperatures would be at the test bundle's **7 foot elevation** at either 18 seconds or 18.2 seconds?

Second) Would you please acknowledge that the NRC's TRACE simulation of FLECHT Run 9573 did **not** predict what steam temperatures would be around the test bundle's **7 foot elevation** at either at 16 seconds, 18 seconds, or 18.2 seconds?

An adequate TRACE simulation of Run 9573 would have predicted cladding temperatures for the test bundle's 7 foot elevation at either 18 seconds or 18.2 seconds. Or an adequate TRACE (or another code or a modified version of TRACE) simulation of Run 9573 would have predicted steam temperatures around the test bundle's 7 foot elevation at either 16 seconds, 18 seconds, or 18.2 seconds.

Such a TRACE simulation of Run 9573 could have been compared to the Westinghouse data indicating that thermal runaway occurred around the test bundle's 7 foot elevation.



The severe-damage zone where thermal runaway occurred--within approximately ±8 inches at the 7 foot elevation.

In an October 22, 2015 e-mail to Daniel Doyle of the NRC, David Lochbaum of Union of Concerned Scientists stated: "The information requested by Mr. Leyse seems entirely on par with

the information exchanged between NRC and NEI --- yet NRC declines to provide Mr. Leyse that which it freely and readily provided NEI." Mr. Lochbaum's entire e-mail is copied below.

I believe that the message of Mr. Lochbaum's e-mail also applies to simple questions I have asked (and are presently asking) you. Please acknowledge that the NRC's TRACE simulation of FLECHT Run 9573 did not predict what cladding temperatures would be at the test bundle's 7 foot elevation at either 18 seconds or 18.2 seconds.

And please acknowledge that the NRC's TRACE simulation of FLECHT Run 9573 did not predict what steam temperatures would be around the test bundle's **7 foot elevation** at either at 16 seconds, 18 seconds, or 18.2 seconds.

Please place this e-mail in ADAMS.

Thank you,

Mark Leyse

References:

1) F. F. Cadek, D. P. Dominicis, R. H. Leyse, Westinghouse, "PWR FLECHT (Full Length Emergency Cooling Heat Transfer) Final Report," WCAP-7665, April 1971, (ADAMS Accession No. ML070780083).

2) NRC, "Draft Interim Review of PRM-50-93/95 Issues Related to Conservatism of 2200 degrees F, Metal-Water Reaction Rate Correlations, and 'The Impression Left from [FLECHT] Run 9573' ," October 16, 2012, (ADAMS Accession No. ML12265A277).

David Lochbaum's October 22, 2015 e-mail:

From: **Dave Lochbaum** <DLochbaum@ucsusa.org>
Date: Thu, Oct 22, 2015 at 12:11 PM
Subject: RE: Re: Status of PRM-50-93/95
To: "Doyle, Daniel" <Daniel.Doyle@nrc.gov>, Mark Leyse <markleyse@gmail.com>

Dear Mr. Doyle:

I do not understand why the NRC is unable to provide a detailed response to Mr. Leyse's questions about the TRACE computer code.

The NRC places high emphasis on transparency.

I understand, and fully respect, that NRC cannot disclose pre-decisional information.

But this matter seems outside of those limitations and boundaries such that the clarification sought by Mr. Leyse could, and should, be provided.

A quick review of documents publicly available in ADAMS returns quite a large number where information on very similar matters is exchanged between NRC and the Nuclear Energy Institute. A few of the many examples includes https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML15257A222, https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML14232A816 ,https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML14246A394, and https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML13136A178.

The last document shows NEI how the NRC staff plans to incorporate NEI's comments on draft Interim Staff Guidance -- allowing the licensees to craft regulatory requirements that might someday apply to them. Seems. pre-decisional information by anyone's definition.

I am not suggesting or implying that any of those exchanges was untoward. I stipulate the opposite - these exchanges were perfectly acceptable because they help reduce the "surprise factor" between the NRC and its licensees.

I cite these examples of entirely proper communication with external stakeholders to question why Mr. Leyse, another external stakeholder, does not get the same treatment. The information requested by Mr. Leyse seems entirely on par with the information exchanged between NRC and NEI --- yet NRC declines to provide Mr. Leyse that which it freely and readily provided NEI.

That seems unfair.

What regulations, policies, or procedures allowed NRC to provide information to NEI and deny information to Mr. Leyse?

I trust that NRC will be able to respond to my question. If not, I guess I could ask Mr. Pietrangelo of NEI if he'd be so kind as to ask the question for me. That would apparently ensure the NRC responded and responded quickly.

Thanks,

Dave Lochbaum

UCS

On Fri, Nov 6, 2015 at 9:48 AM, Mohseni, Aby <Aby.Mohseni@nrc.gov> wrote:

> Mr. Leyse,

The NRC staff understands your concerns and will take your first and third questions into consideration as it develops the final evaluation. In response to your second question, the October 2012 draft interim review noted this damage on page 4, lines 23 – 27. The NRC's findings on PRM-50-93/95 issues will not be final until the NRC publishes a notice of final action on this petition for rulemaking in the Federal Register.

Respectfully,

Aby Mohseni

Deputy Director

Division of Policy and Rulemaking

Office of Nuclear Reactor Regulation

U.S. Nuclear Regulatory Commission

From: Mark Leyse [mailto:markleyse@gmail.com]
Sent: Thursday, November 05, 2015 3:42 AM
To: Mohseni, Aby
Cc: Burnell, Scott; Doyle, Daniel; Inverso, Tara; Kokajko, Lawrence; CHAIRMAN Resource; CMRSVINICKI Resource; CMROSTENDORFF Resource; CMRBARAN Resource; bobleyse@aol.com; shadis@prexar.com; Bladey, Cindy; DeJesus, Anthony; dlochbaum@ucsusa.org; elyman@ucsusa.org; michal_freedhoff@markey.senate.gov; mmckinzie@nrdc.org; tcochran@nrdc.org; gfettus@nrdc.org; balemayehu@nrdc.org; DBrancato@riverkeeper.org; PGallay@riverkeeper.org; Dean, Bill; Johnson, Michael; jim.riccio@greenpeace.org; william.freebairn@platts.com; bpanko@eenews.net; Mary Lampert; Paul Gunter; RulemakingComments Resource; PDR Resource; Powers, Dana A; Diane Curran; Richard Webster; Clay Turnbull
Subject: [External_Sender] Re: Status of PRM-50-93/95

Dear Mr. Mohseni:

Thank you for your reply. Would you please answer the **second** and **third** of the three questions I asked you in the e-mail I sent on November 1, 2015. The second and third questions are simple questions pertinent to the TRACE simulation of FLECHT Run 9573. These two questions are pertinent to work the NRC has **already completed** for its draft interim review. The questions are copied below.

Three Questions:

First) Please tell me, was the section of the Run 9573 test bundle that Westinghouse called the "severe-damage zone," where local temperatures exceeded 1644.3 K (2500°F) at 18.2 seconds, bounded by the TRACE "average" temperature predictions when the metal-water reaction is accounted for with either the Cathcart-Pawel or Baker-Just models? If your answer is **YES**, please explain why.

Second) Would you please acknowledge the existence of severe-damage zone that Westinghouse reported?

Third) Would you please acknowledge that the NRC's TRACE simulation of FLECHT Run 9573 **excluded** the 7 foot steam-probe thermocouple data that Westinghouse reported? That is the test data that indicated thermal runaway.

To answer the **second question** all you need to do is read page 3.97 of the Westinghouse report WCAP-7665. On page 3.97 of WCAP-7665 you'll see the statement:"Post-test bundle inspection indicated a locally severe damage zone within approximately ±8 inches of a Zircaloy grid at the 7 ft elevation." (A reference to WCAP-7665 is below.) You can access WCAP-7665 simply by clicking this link: http://pbadupws.nrc.gov/docs/ML0707/ML070780083.pdf

To answer the **third question** all you need to do is review the NRC's "Draft Interim Review of PRM-50-93/95 Issues Related...Metal-Water Reaction Rate Correlations..." (A reference to the Draft Interim Review is below.) You can access the Draft Interim Review simply by clicking this link: http://pbadupws.nrc.gov/docs/ML1226/ML12265A277.pdf Please note that on page 3.97 of WCAP-7665 there is a reference to the the 7 foot steam-probe thermocouple data.

(I realize that it may be difficult to answer the **first question** at this point; after all, the severe-damage zone (the section of zirconium cladding that incurred thermal runaway) and its related data were **not** included in the NRC's TRACE simulation of FLECHT Run 9573. As I said in my November 1, 2015 e-mail, that is like simulating a forest fire and omitting the areas of the forest where trees burned down.)

What the NRC Commissioners Instructed on January 31, 2013:

At a January 31, 2013 meeting on public participation, the NRC Commissioners instructed: "The staff should consider and respond to Mark Leyse's comments regarding his petition for rulemaking PRM-50-93 in its review of that petition." (A reference to the Commissioners' meeting is below.)

The Staff has **NOT** responded to the comments I made to the Commissioners. I gave the Commissioners my presentation over two and a half years ago. My comments were about the NRC's flawed TRACE Simulation of Run 9573--about the fact that the data from the 7 foot elevation was omitted. That is the test data that indicated thermal runaway. I also showed the Commissioners photographs of the test bundle's severe damage zone.

Please place this e-mail in ADAMS.

Thank you,

Mark Leyse

References:

1) F. F. Cadek, D. P. Dominicis, R. H. Leyse, Westinghouse, "PWR FLECHT (Full Length Emergency Cooling Heat Transfer) Final Report," WCAP-7665, April 1971, (ADAMS Accession No. ML070780083).

2) NRC, "Draft Interim Review of PRM-50-93/95 Issues Related to Conservatism of 2200 degrees F, Metal-Water Reaction Rate Correlations, and 'The Impression Left from [FLECHT] Run 9573' ," October 16, 2012, (ADAMS Accession No. ML12265A277).

3) NRC, "Staff Requirements: Briefing on Public Participation on NRC Regulatory Decision-Making, January 31, 2013," March 5, 2013, (ADAMS Accession No. ML13064A407).

4) Mark Leyse, "Mark Leyse's Comments for the January 31, 2013 Meeting on Public Participation in NRC Regulatory Decision-Making," January 30, 2013, in NRC, "Public Participation in NRC Regulatory Decision-Making," January 31, 2013, (ADAMS Accession No. ML13031A508).