

COVER



SHEET

To: Bill Huffman/L. Lois(NRC), Cliff Fineman(INEL), L. Hochreiter(PSU)
Subject: Text to close WCOBRA/TRAC CAD Discussion Items 1i(3),2a,12a,12b
Date: February 28, 1997
Pages: 3, including this cover sheet.

COMMENTS:

Attached are responses, in accordance with our telecon of 2/18/97, to close discussion items 1i(3), 2a, 12a, 12b. A completely new response is provided for the former two items, while additions to the previously provided responses to items 12a and 12b are highlighted in the text. Comments about the attachment may be directed to the undersigned. In the near future, responses will be provided to close items 2e and 2g. Further, responses to the remaining discussion items will be provided as they become available.

cc: B. Rarig, B. McIntyre (for informal NRC correspondence file), E. Novendstern

EC-E 3-09

A handwritten signature in cursive script, appearing to read "Bob".

From the desk of...
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Response to Question 1-3

This phenomena is ranked lower in the Westinghouse PIRT as compared to the LANL PIRT. There were two elements to the LANL rationale for the ranking of this item from page 64 of the LANL report, "Multidimensional effects in the core enhance the heat transfer by supplying more water to the high powered bundles below the quench front". We agree with this part of the statement and is one reason that the low powered regions are modeled as a separate channel in the WCOBRA/TRAC PWR model. The quench front is uniform across the core such that the lower powered bundles quench at about the same time as the high powered bundles, and there is cross flow into the hot assembly from the adjacent, lower powered assemblies BELOW the quench front.

LANL also says in the same sentence on page 64, "and more entrained water in the liquid deficient region". We do not agree that there is more water entrained into the hot assembly from the adjacent assemblies ABOVE the quench front which is what the LANL statement implies.

Therefore, we ranked this item as a "5", but did consider it important enough that we modeled multiple channels in the reactor to capture this three-dimensional behavior.

Response to Question 2a

The calculated PCTs are significantly below the threshold for significant zirc/water reaction which can influence the resulting PCT. However, the methodology which is used to calculate the AP600 PCT is the same as that used for the three and four loop plants. Therefore, the uncertainty of the zirc/water reaction and its effects will be calculated in the "hot spot" calculations; however, since the PCTs are expected to be so low, the impact of the uncertainties and the zirc/water reaction are expected to be negligible.

12. The following questions relate to Section 4.4.

- a. Table 4.4-1: Has the Westinghouse grid deformation analysis been approved by the NRC? If not, will Westinghouse commit to addressing grid deformation if the NRC review results in this becoming a concern for the AP600? For mixed cores, how will Westinghouse address mixed cores if they are used in AP600 in the future?

Since seismic loads are a site-specific parameter, it is difficult to assess their impact at this time. The structural and mechanical integrity of the fuel is evaluated for each fuel cycle. In the event fuel grid deformation becomes a concern for a proposed AP600 site, Westinghouse will address its impact on the large break LOCA analysis. If Westinghouse fuel of a different design or another vendor's fuel is placed into AP600 in the future, an evaluation will be performed of the mixed core; the evaluation will consider any differences in the dimensions, hydraulic resistances and burnup effects between the fuel types to be loaded.

- b. Westinghouse identified power shapes (PSs) 2, 3, 4 and 11 as the PSs it would evaluate from the RMR to determine the limiting PS for AP600. Justify the basis for selecting these PSs as the ones to study the AP600. Could the excellent blowdown cooling for the AP600 cause the limiting axial power shape(s) to change for AP600 relative to the 3-/4-loop plants? Also, Westinghouse has an approach to identify limiting axial power shapes to meet Appendix K, Item I.A. Does this approach have any applicability for AP600? Justify your answer.

The 3/4 loop power shapes were established to be bounding for all Westinghouse core designs, and they are bounding for AP600 as well. To further demonstrate the limiting nature of power shapes 2, 3, 4 and 11 for AP600, a bottom-skewed power shape case was also executed and shown to be non-limiting. Power shape 3 is the bounding shape and is applied in all AP600 matrix sensitivity cases. The power shape results will be reported and justified in the SSAR large break LOCA section.

FAX to DINO SCALETTI

March 5, 1997

CC: Sharon or Dino, please make copies for:

Ted Quay
Bill Huffman
Diane Jackson
Tom Kenyon
Joe Sebrosky

Cindy Haag
Don Lindgren
Robin Nydes
Brian McIntyre
Ed Cummins
Bob Vijuk

This is a reminder list of the Open Items where we have recently provided background documentation showing the difference between "W Status" and "NRC Status". In all cases, we believe the next action is with NRC and await your definitization of a Westinghouse action or your direction to change the "NRC Status" to something other than "Action W". Note that we have received no information from NRC on items on this list for over a week. **Note that submittal dates over a year old and request dates over a month old are in bold type.**

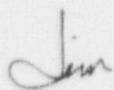
Open Item Number	Westinghouse Submittal	Request for Status Change
142 (M3.11-9)	2/29/96	2/3/97 3/4/97
157 (M5.2.5-13)	1/9/97	2/12/97
164 (M5.2.5-20)	1/10/97	2/12/97
172 (M5.2.5-29)	1/14/97	2/14/97
173 (M5.2.5-30)	1/14/97	2/17/97
182 (M5.4.11-5)	1/10/97	2/20/97
184 (M5.4.11-7)	1/13/97	2/20/97
405	7/8/96	2/11/97
681 (DSER 3.8.2.4-3)	2/11/97	2/17/97
706 (DSER 3.8.2.4-28)	2/11/97	2/17/97
710 (DSER 3.8.3.1-1)	1/16/97	2/18/97
716 (DSER 3.8.3.2-5)	1/16/97	2/18/97
717 (DSER 3.8.3.3-1)	1/16/97	2/18/97
718 (DSER 3.8.3.3-2)	1/16/97	2/18/97

Open Item Number	Westinghouse Submittal	Request for Status Change
722 (DSER 3.8.3.4-3)	1/16/97	2/18/97
724 (DSER 3.8.3.4-5)	1/16/97	2/18/97
729 (DSER 3.8.3.4-10)	1/16/97	2/18/97
731 (DSER 3.8.3.4-12)	1/16/97	2/18/97
740 (DSER 3.8.4.1-3)	1/16/97	2/20/97
754 (DSER 3.8.4.4-6)	1/16/97	2/20/97
757 (DSER 3.8.4.5-1)	1/16/97	2/20/97
758 (DSER 3.8.4.5-2)	1/16/97	2/20/97
782 (DSER 3.9.2.3-1)	6/30/95	2/28/97
783 (DSER 3.9.2.3-2)	2/19/97	2/28/97
786 (DSER 3.9.3.1-1)	2/29/96	2/28/97
793 (DSER 3.9.3.3-2)	2/19/97	2/28/97
801 (DSER 3.9.6.2-4)	2/19/97	2/28/97
802 (DSER 3.9.6.2-5)	2/19/97	2/28/97
805 (DSER 3.9.6.2-8)	2/19/97	2/28/97
807 (DSER 3.9.6.3-1)	2/19/97	2/28/97
809 (DSER 3.9.6.4-2)	2/19/97	2/28/97
854 (DSER 4.2.8-1)	4/12/96	3/4/97
1172 (DSER 11.2-6)	2/21/97	3/4/97
1210 (DSER 12.4.2-2)	4/30/96	2/6/97
1227	7/8/96	2/11/97
1228	7/8/96	2/11/97
1231	7/8/96	2/11/97
1232	7/8/96	2/11/97
1716	12/17/96	2/28/97
1727	12/17/96	2/28/97
1730	2/19/97	2/28/97
1731	2/19/97	2/28/97
1736	2/19/97	2/28/97

Open Item Number	Westinghouse Submittal	Request for Status Change
1740	10/11/96	2/28/97
1742	12/17/96	2/28/97
1745	12/17/96	2/28/97
1747	12/17/96	2/28/97
1753	12/17/96	2/28/97
1760	12/17/96	2/28/97
1792 (DSER-CN 3.9.2.1-4)	10/23/96	2/28/97
1793 (DSER-CN 3.9.2.3-1)	10/23/96	2/28/97
1797 (DSER-CN 3.9.2.4-4)	10/14/96	2/28/97
1802 (DSER-CN 3.9.3.3-3)	9/5/96	2/28/97
1803 (DSER-CN 3.9.3.3-4)	9/5/96	2/28/97
1807 (DSER-CN 3.9.7-1)	6/19/96	2/28/97
1888 (DSER-COL 3.8.2.4-1)	2/11/97	2/17/97
2034 (DSER-OI50 13.)	7/8/96	2/11/97
2066	12/17/96	2/28/97
2347	1/16/97	2/18/97
2348	1/16/97	2/18/97
2349	1/16/97	2/18/97
3057	5/30/96	2/18/97
3247 (RAI 230.98)	4/30/96	2/18/97
3372 (RAI 210.213)	1/8/97	2/28/97
4617	2/14/97	2/14/97
4998	2/19/97	2/28/97
4999	2/19/97	2/28/97
5001	2/19/97	2/28/97
5002	2/19/97	2/28/97

Note that the status was changed for a large number of items so they have been removed from the table.

Thanks for your help.

A handwritten signature in cursive script, appearing to read "Jim".

Jim Winters

FAX to DINO SCALETTI

March 5, 1997

CC: Sharon or Dino, please make copies for:

Ted Quay
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NRC is requested to please acknowledge receipt of information related to each of the following Open Items. These are a subset of the items with "Action W" in "NRC Status" for which I have personally checked, since the first of the year, that we have submitted what we believe is the resolving information. Unlike those on the other list I will send you today, I have not prepared a background package for each of these. However, the reviewer in each case should have a submittal from Westinghouse as identified in OITS for the item. Recognizing that reviewing for completeness of the response in each case constitutes an NRC action, we recommend that receipt acknowledgement be accompanied by direction to change their "NRC Status" to "Action N". If these are truly "Action W", please provide a description of the action Westinghouse is expected to take. We know of no action required. This is the seventh weekly request of this type. Many of these are very (over 6 months) old. We are not asking for resolution or even NRC review at this time, just acknowledgement that you have received the information as outlined in the OITS Status Detail. If your investigation shows I goofed and didn't remove item numbers that I should have, please let me know.

3, 142, 157, 164, 172, 173, 182, 184, 262, 300, 305, 308, 333, 405, 425, 457, 458, 628, 681, 698, 706, 710, 716, 717, 718, 722, 724, 729, 731, 740, 754, 757, 758, 782, 783, 786, 793, 801, 802, 805, 807, 809, 854, 972, 973, 1009, 1101, 1102, 1172, 1210, 1225, 1226, 1227, 1228, 1231, 1232, 1317, 1458, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1707, 1716, 1727, 1730, 1731, 1736, 1740, 1742, 1745, 1747, 1753, 1760, 1792, 1793, 1797, 1802, 1803, 1807, 1885, 1888, 1996, 1999, 2018, 2019, 2023, 2024, 2025, 2034, 2040, 2045, 2066, 2051, 2199, 2200, 2201, 2202, 2272, 2273, 2347, 2348, 2349, 2442, 2457, 2515, 2676, 2683, 2684, 2686, 2691, 2698, 2939, 2942, 2945, 2958, 2959, 2960, 2961, 2962, 2963, 2964, 2965, 2966, 2967, 2968, 2969, 2970, 2971, 2972, 2973, 2974, 2975, 2976, 2977, 2978, 2979, 2981, 2982, 2983, 2984, 2985, 2986, 3057, 3098, 3122, 3126, 3127, 3128, 3197, 3202, 3247, 3372, 3398, 3399, 3400, 3401, 3402, 3427, 3439, 3468, 3469, 3470, 3471, 3472, 3473, 3505, 3517, 3895, 3944, 3945, 3946, 3947, 3948, 3949, 3950, 3951, 3952, 3953, 3954, 3955, 3956, 3957, 3958, 4116, 4117, 4118, 4119, 4120, 4121, 4122, 4123, 4124, 4125, 4126, 4127, 4128, 4129, 4130, 4131, 4132, 4133, 4134, 4135, 4136, 4137, 4138, 4139, 4140, 4141, 4142, 4143, 4144, 4151, 4202, 4203, 4204, 4205, 4206, 4209, 4214, 4224, 4225, 4226, 4227, 4998, 4999, 5001, 5002, and 5012.



412-374-5290

INSERT 1

Fire Barriers

As described in subsection 9.5.1.2.1.1, non-combustible fire barriers are provided in accordance with BTP CMEB 9.5-1 and NFPA 803 (Reference 2). The equivalent fire barrier ratings are shown in Figures 9A-1 through 9A-5. ~~Fire barriers or equivalent structural features form the boundaries of fire areas. For most fire zones in containment, fire barriers separate redundant equipment. If cables of a safety-related division must pass through or adjacent to a fire area or fire zone of an unrelated division, they are protected by fire barriers.~~

INSERT 2

Fire Areas

Fire areas are three dimensional spaces designed to contain a fire that may exist within them. They are surrounded by fire barriers, ~~structure equivalents to fire barriers~~, fire barrier penetration protection, and other devices, such as those within the heating and air conditioning ducts, that isolate a fire to within the fire area.

INSERT 3

Outside containment, zone of influence is not defined. A fire outside containment is assumed to affect its entire fire area. Inside the containment fire area, the zone of influence is defined as the entire fire zone containing the fire.

In containment, fire zones are usually bounded by physical structures equivalent to a 3-hour fire barrier. In some cases, other fire protection features apply, such as distance or lack of fuel. For example, fire zone 1100 AF 11300A has no physical barrier between it and fire zone 1100 AF 11300B. This is due to the fact that all combustibles are at the extreme ends of these fire zones and are separated by more than 40 feet. There will be no communication of a fire from one fire zone to the other. Other examples include fire zones 1100 AF 11301 and 1100 AF 11302 which are open at their tops into fire zone 1100 AF 11500. Fire zone 1100 AF 11500 is the open upper containment. With no fuel sources over fire zones 1100 AF 11301 and 1100 AF 11302, there will be no fire communication between these zones and fire zone 1100 AF 11500.

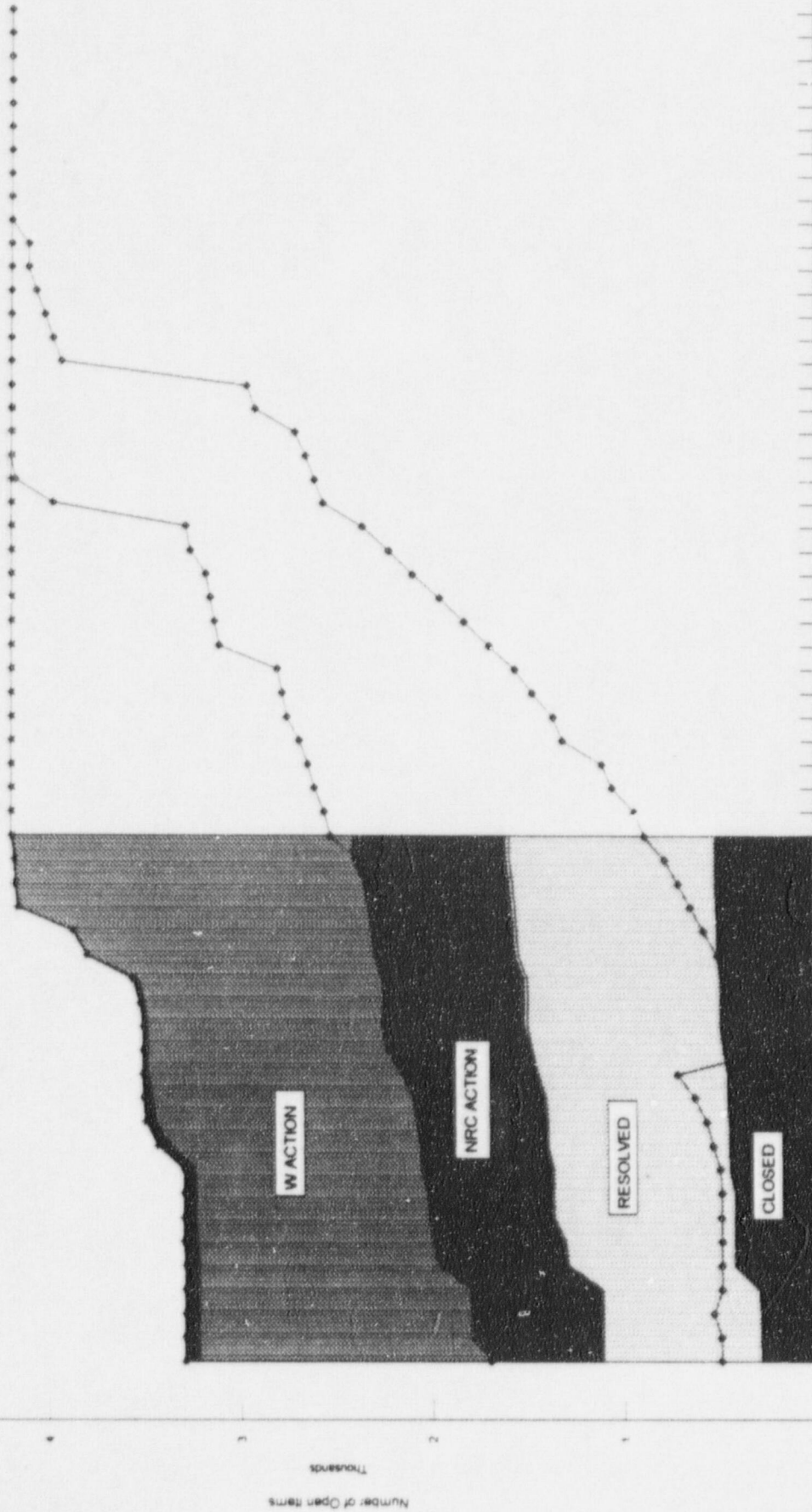
INSERT 4

Fire Zones

Fire zones are three dimensional spaces within fire areas. Fire zones are identified uniquely to indicate that they have fire protection features or attributes different than other fire zones in a given area. ~~For example, this difference may be due to different sprinkler coverage due to different fuel loadings.~~ In containment, fire zones are identified to establish "zones of influence".

OPEN ITEM CLOSURE

03/06/97



- ◆ Closed Goal
- ◆ Action W Goal
- ◆ Total Open Items
- ◆ Closed
- ◆ Resolved
- ◆ Confirm W
- Confirm N
- Audit N
- Action N
- Action W
- Others