COVER SHEET

FAX

To: Ralph Landry (NRC)
Cliff Fineman (INEEL)

Subject: Quench Model

Date: March 10, 1997

Pages: Three, including this cover sheet.

COMMENTS:

Ralph,

Attached is a draft write-up from the T/H Uncertainty report and a figure that attempts to explain the Quench Model we discussed last week. Please give a copy to Bill Huffman. Thanks.

Earl

cc: B. McIntyre (NRC Informal File), L. Hochreiter, M. Young, R. Osterrieder, C. Thompson, A. Gagnon, R. Fittante, File 7.6

From the desk of...

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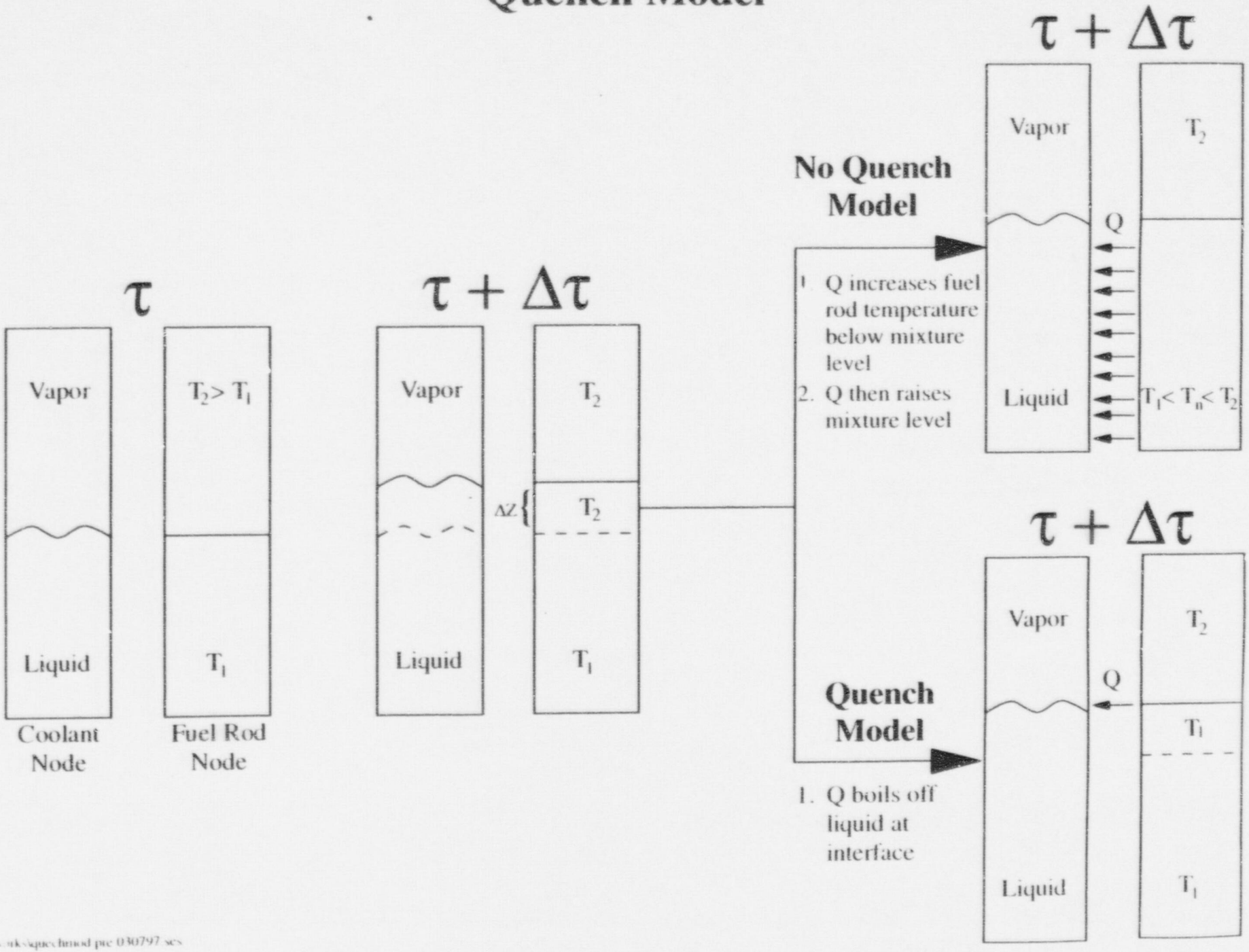
Quench Model

Item 7 above, " Core Node Heat Transfer Model", has been modified from the model described in Reference 5.2.3, Chapter 7. The model described in Reference 5.2.3 would determine the amount of stored energy in the fuel rod covered by the advancing mixture level. The stored energy in the portion of the fuel rod which was covered by the mixture level during a time step was combined with the stored energy of that portion of the fuel rod which was below the mixture level in the previous time step. This combining of the energies resulted in an increase in the temperature of the fuel rod below the mixture level. While this method conserved energy, it also resulted in an increase in heat transfer between the portion of the rod below the mixture level and the associated fluid node. The increased heat transfer below the mixture level increased the void fraction, which swelled the mixture, forcing the mixture level higher. This process of coupling the mixture level and the fuel rod temperature could feedback upon itself resulting in a rapid increase in the mixture level to a height above the active fuel, particularly at low pressure. When the mixture level rises above the top of the active fuel, the coupling between the mixture level and fuel temperature no longer exists and NOTRUMP's drift flux, bubble rise, and mixture level tracking models allow the mixture level to fall back to an appropriate level within the core. This tendency for the mixture level to spike to a height above the active fuel was corrected by requiring the energy removed from the fuel rod at the mixture interface to generate steam at the mixture interface, instead of increasing the fuel rod temperature below the mixture level. This approach more closely models the effects of fuel rod quenching and corrects the previous models tendency to swell the mixture and force the mixture level upwards in situations where an uncovered core was recovering.

Reference:

5.2.3 Meyer, P. E., "NOTRUMP, A Nodal Transient Small Break and General Network Code," WCAP-10079-P-A (Proprietary) and WCAP-10080-A (Non-Proprietary), August 1985.

Quench Model



FAX to DINO SCALETTI

March 14, 1997

CC: Sharon or Dino, please make copies for: Tom Kenyon
Ted Quay

Ed Cummins
Bob Vijuk
Brian McIntyre

OPEN ITEM #405

To meet the SECY-97-051 schedule of "Applicant Submits Final SSAR Revisions & Documentation" by 5/97, we believe that NRC must acknowledge receipt of all Westinghouse submittals by May 30, 1997. This is just 77 calendar days away. In my quest to make sure we have provided NRC with everything needed to prepare an FSER, I have been providing background packages for open items that we believe are complete. Relevant documentation related to Open Item #405 is attached. We provided a revision of the AP600 Security Design Vulnerability Analysis on July 8, 1996 (over 8 months ago). We discussed this submittal with a reviewer in a telephone conversation over six weeks ago. NRC obviously had our submittal at than time. We then submitted a revision of the analysis document on February 28, 1997, but there were no changes affecting the vulnerability analysis itself. We believe that this information resolves the concerns of item #405 and that NRC has a responsibility to acknowledge its receipt. We requested a change in the NRC Status for this item with others in Chapter 13 on February 11, 1997 (over a month ago). It seems a reasonable request that NRC acknowledge receipt of the information. We request that NRC provide a definitive action for Westinghouse or provide direction to change the status of this item. We recommend "Action N" or "Closed". I will be sending this message by both fax and E-Mail. Thank you.

Jim

Jim Winters
412-374-5290

AP600 Open Item Tracking System Database: Executive Summary

Date: 3/14/97

Selection: [item no] between 405 And 405 Sorted by Item #

Item No	Branch	DSER Section/ Question	Type	Title/Description Detail Status	Resp Engineer	(W) Status	NRC Status	Letter No. /	Date
405	NRR/TSGB	13.6	MTG-OI		McIntyre, B	Closed	Action W		7/8/96

(October 25, 1994 Security Meeting) Provide a vulnerabilty analysis

Vulnerability analysis will b: submitted with revised Security plan

AP600 Security Design Vulnerability Analysis submitted 7/8/96

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