Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

February 1, 2010
U7-C-STP-NRC-100034

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Supplemental Response to Request for Additional Information

Reference: Letter, Mark McBurnett to Document Control Desk, "Response to Request for Additional Information,"U7-C-STP-NRC-100020, dated January 20, 2010.

The referenced letter provided STPNOC's response to RAI 06.02.01.01.C-13, and inadvertently did not include the figures referenced in the response. The attachment to this letter provides the response with the figures included. This response supersedes the previous response to this RAI question in its entirety. The attachment provides the following supplemental response:

RAI 06.02.01.01.C-13 Supp

There are no commitments in this letter.

If you have any questions regarding this response, please contact Scott Head at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

D091
NRO

STI 32607379

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 2/1/2010

Mark McBurnett
Vice-President, Oversight and Regulatory Affairs
South Texas Project Units 3 & 4

jet

Attachment:

Question 06.02.01.01.C-13 Supp

cc: w/o attachment except*
(paper copy)

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RAI 06.02.01.01.C-13 Supp:

QUESTION:

In the pool swell analysis (UTLR-0005-P Rev 0 (September 2009)), the wetwell node size is limited to a specific fixed value. Please provide:

a) basis for the choice of this value,

b) discussion on potential effect of different node sizes on pool swell behavior,

c) basis and/or rational for selection of the maximum bubble size,

d) discussion on potential effect of different bubble size, including the effect of the bubble size that does not coincide with the calculational node size

RESPONSE:

a) In the GOTHIC methodology for obtaining bounding values for the pool swell and swell velocity, the swell transient is tracked by noting the time that the liquid volume fraction passes through 0.5 for each node above the initial pool level. The peak swell level could be up to one node height above that indicated by this data extraction process. The reported peak values include one additional cell height to account for this data extraction uncertainty. The GOTHIC methodology for the ABWR pool swell uses a node size that was selected to provide a sufficient number of data points to establish the surface level versus time curve. Also, this limits the uncertainty in the data extraction to that selected node height. This cell height is built into the methodology that was shown to conservatively bound the swell height and swell velocity from the Pressure Suppression Test Facility (PSTF) and the previously accepted DCD values.

b) The GOTHIC model was modified to investigate the effects of using different nodes sizes on the pool swell and swell velocity. Node sizes of one-half and two times the selected node size were used to perform calculations for comparison with the results for the selected node size as documented in UTLR-0005-P Rev. 0. Figures 1 and 2 show the pool swell height and the surface velocity for the three cases. The results show that the pool swell and swell velocity are not very sensitive to node size within the sensitivity study range (one-half to two times node size). The variance in the maximum swell elevation is within the data extraction uncertainty (one node height).

c) In GOTHIC 7.2a, the diameter of large bubbles within a cell is limited to the smaller of 6" and the specified hydraulic diameter for the cell. In the GOTHIC model, the cell hydraulic diameter was very large to minimize frictional drag. Therefore, the large bubbles are limited to 6". This limit is a carry over from GOTHIC's precursor COBRA codes that were used and validated for two-phase in-core analysis. The 6" limit on the large bubble size within a cell does not limit the overall size of a steam/air region. If the steam/air injection

rate is large enough, a contiguous block of cells can be completely filled with the air/steam mixture.

d) To investigate the influence of the large bubble size limit on the pool swell results, GOTHIC 7.2a was modified to change this limit by a factor of two (larger and smaller). Figures 3 and 4 show the pool swell and the surface velocity for the three cases using a large bubble size limit of 3", 6" and 12". These cases all used the 6" node size from the established methodology. The results show that the pool swell and swell velocity are not very sensitive to the maximum bubble size within the sensitivity study range (3" to 12"). The unmodified code gives the highest pool swell by a small margin.

There is no COLA change required as a result of this response.

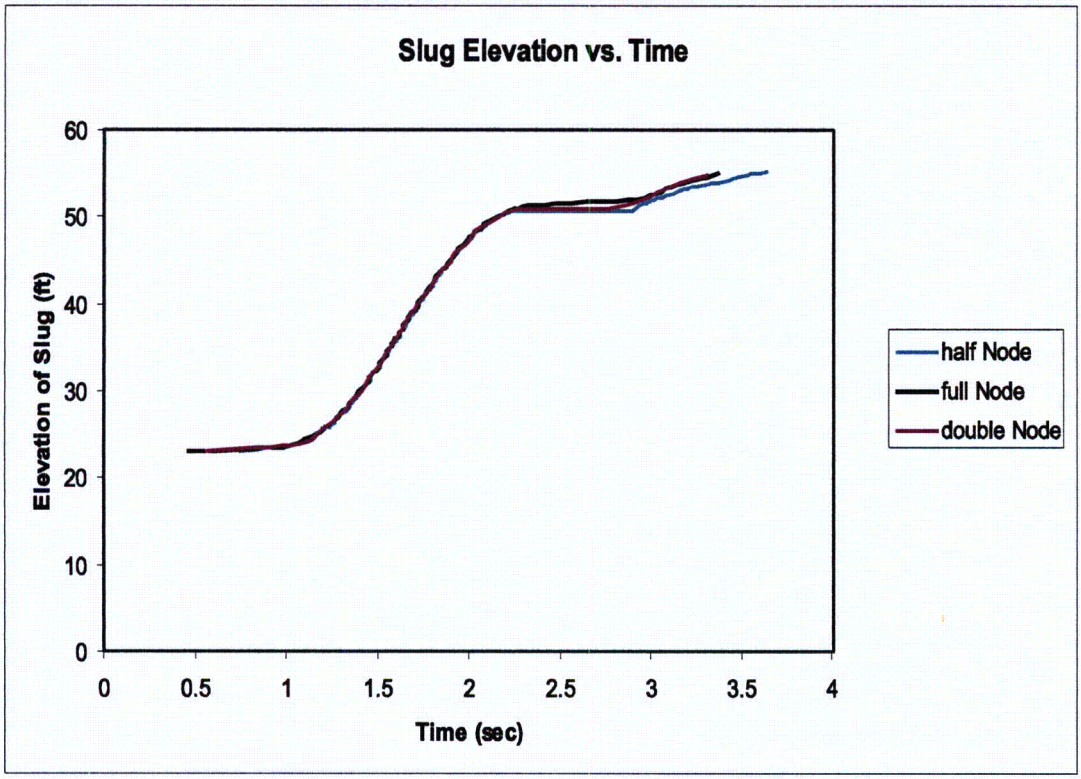

Figure 1 Influence of Node Size on Pool Swell

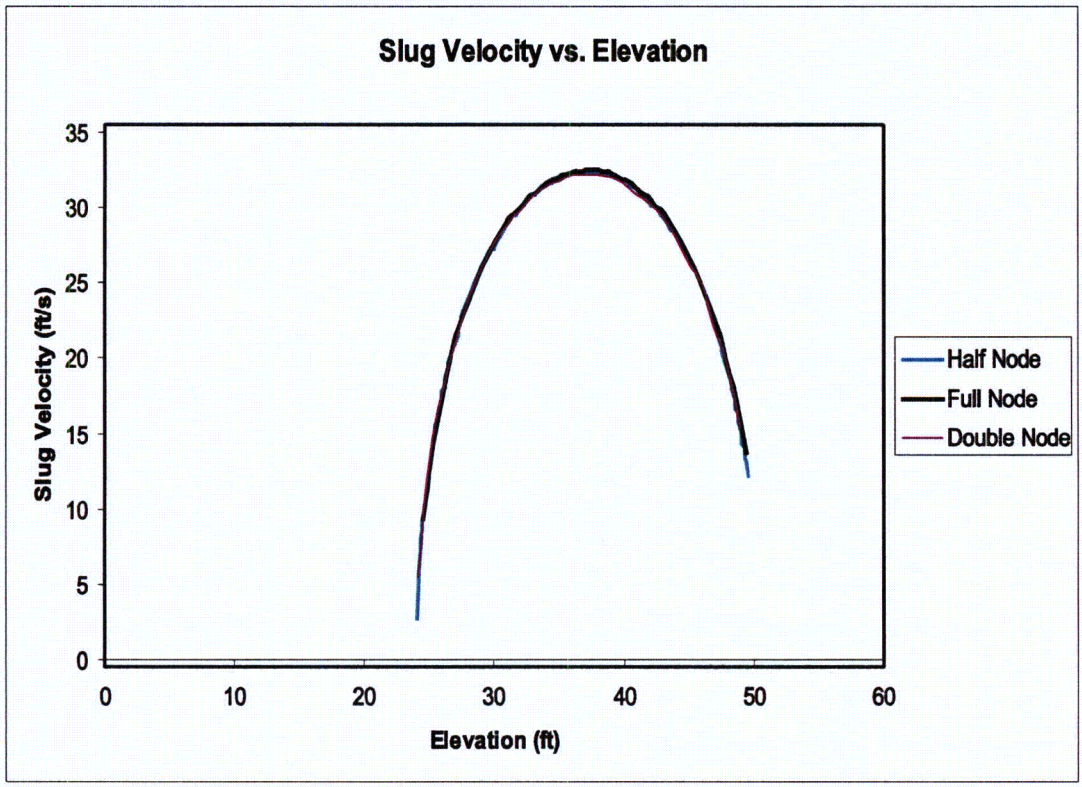

Figure 2 Influence of Node Size on Pool Swell Velocity

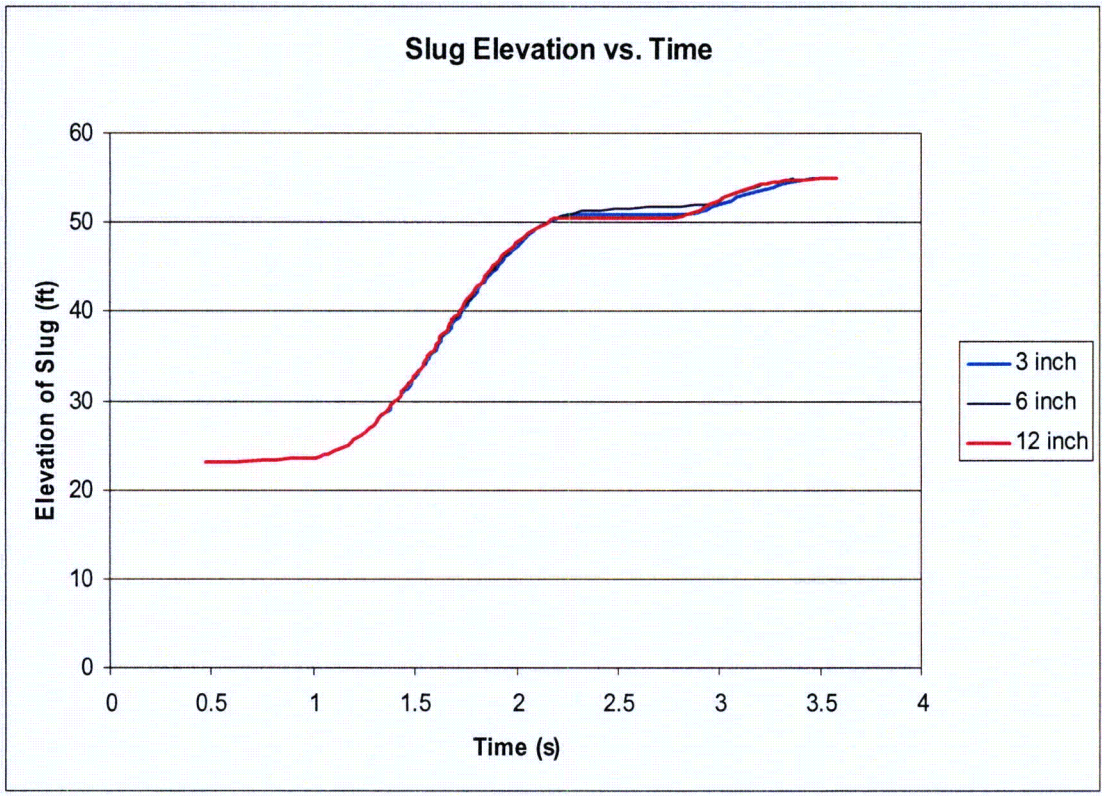

Figure 3 Influence of Large Bubble Maximum Diameter on Pool Swell

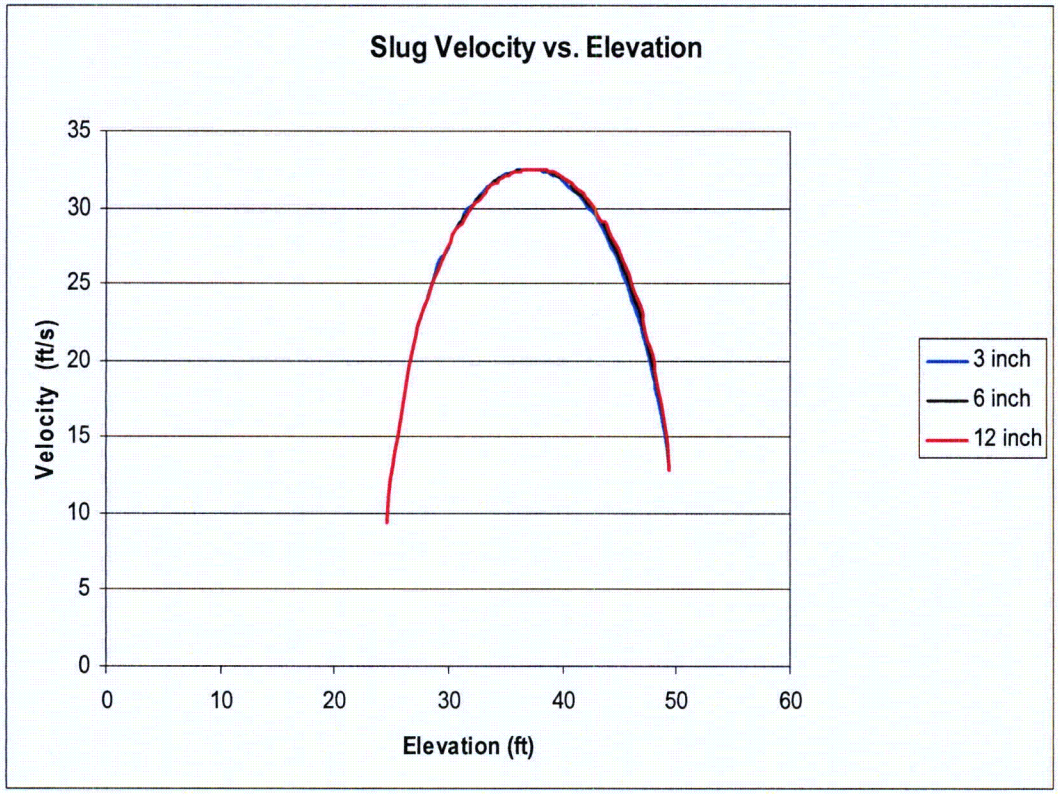

Figure 4 Influence of Large Bubble Maximum Diameter on Pool Swell Velocity