From: Christian Araguas
To: <JTDAVIS@southernco.com>
Date: 2/23/2007 3:42:18 PM
Subject: Followup to RAI 2.3.4-4

Jim,

Per our discussion, attached is the 5% exceedance bounding curve that the staff generated.

Christian Araguas

Hearing Identifier: Vogtle_Public
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Creation Date: 2/23/2007 3:42:18 PM
From: Christian Araguas

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Recipients
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Reply Requested: No
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None

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Follow-up for RAI 2.3.4-4

Brad Harvey
Joe Hoch

February 21, 2007

RAI: Section 2.3.4 of the SSAR states that the 0-2 hour maximum sector-dependent 0.5 percentile χ/Q values are greater than the corresponding overall site 5 percentile χ/Q values at the EAB and LPZ. The staff ran the PAVAN computer code using the PAVAN input files provided during a site audit conducted on December 6, 2006 and found the overall site 5 percentile χ/Q values at the EAB and LPZ are the limiting values for the site. Please confirm which set of χ/Q values (the maximum sector 0.5 percentile χ/Q values or the overall site 5 percentile χ/Q values) are bounding.

Conference Call: The applicant stated that the summary table from the PAVAN output file was not correct and they used the "raw" overall site χ/Q data instead to calculate the overall site 5 percentile χ/Q value. [1]

Follow-up: The staff disagrees with the applicant's assessment. The staff would like to draw attention to Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants," Section C.3, "Determination of 5 percent overall site χ/Q value." This section states the following (emphasis added):

> *"Using the χ/Q values calculated according to regulatory position 1, an overall cumulative probability distribution for all directions combined should be constructed. A plot of χ/Q versus probability of being exceeded should be made, and* ***an upper bound curve should be drawn****.* ***The 2-hour χ/Q value that is exceeded 5 percent of the time should be selected from this curve*** *as representing the dispersion condition indicative of the type of release being considered."*

As an example, the staff produced the following graph of overall site EAB χ/Q values from a PAVAN output generated from the applicant's PAVAN input file. This graph shows the "raw" overall site χ/Q values and the resulting upper bound curve on a log-normal scale. Based on this curve, the 5 percent overall site EAB χ/Q value is 3.42×10^{-4} sec/m^3. This χ/Q value is larger than any of the 0.5 percentile sector-dependent χ/Q values and therefore should be used as the 0–2 hour EAB χ/Q value.

[1] The "raw" overall site χ/Q data are defined as the ordered χ/Q values and the frequency with which these values are reached or exceeded.
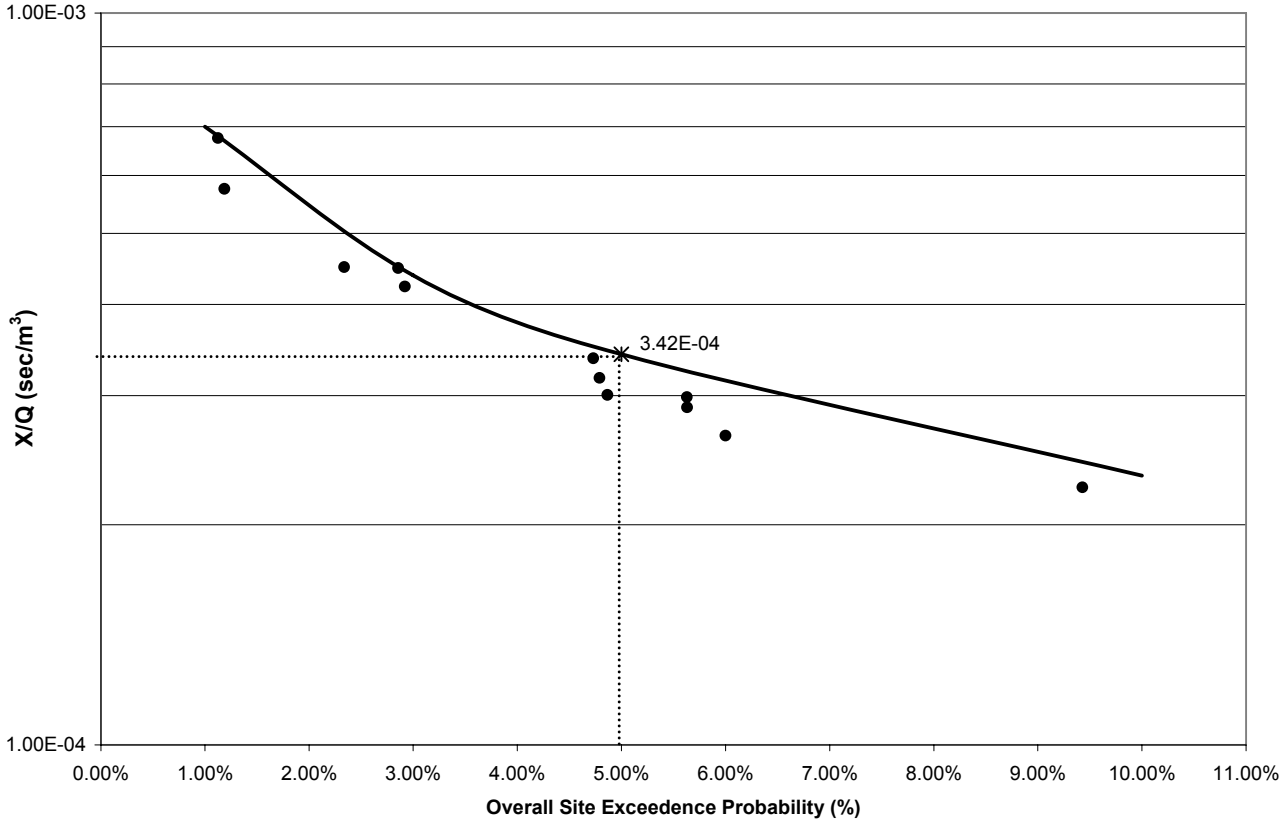
Figure 1: Vogtle ESP Overall Site EAB χ/Q Values
Ordered χ/Q Values versus the Upper Bound Curve χ/Q Values