

Dennig, Robert

From: Basu, Sudhamay *RS*
Sent: Monday, August 27, 2012 2:44 PM
To: Dennig, Robert
Subject: FW: [EXTERNAL] RE: 27 Case Results

Follow Up Flag: Follow up
Flag Status: Flagged

Bob,

Further follow-on to your DBA DF calculations (RASCAL etc.). Ignore the last two e-mail in the chain. Those are not pertinent to your subject.

Sud

-----Original Message-----

From: Osborn, Douglas [mailto:dosborn@sandia.gov] *sandia*
Sent: Monday, August 27, 2012 2:39 PM
To: Hart, Michelle; Basu, Sudhamay
Cc: Lee, Richard; Bixler, Nathan E
Subject: RE: [EXTERNAL] RE: 27 Case Results

Michelle and Sud,

In order to determine a 2-hr dose at the EAB, we would need to modify the current MACCS2 model. I would need to work with Nate on this and I am not certain how long it would take to make the change and rerun all the models (~70 MACCS2 cases).

For the LPZ dose, if you consider the 'duration of the accident' to be EITHER

1. the one-week emergency-phase dose, and/or 2. a person at the EAB which reaches a predetermined dose limit and is then evacuated within the one-week emergency-phase

Then we do currently report this as the 'Peak Dose' in the results I've provided.

Regards,
Doug

-----Original Message-----

From: Hart, Michelle [mailto:Michelle.Hart@nrc.gov] *INFO*
Sent: Monday, August 27, 2012 7:00 AM
To: Basu, Sudhamay; Osborn, Douglas
Cc: Lee, Richard
Subject: RE: [EXTERNAL] RE: 27 Case Results

The siting criteria for currently licensed power reactors is given either in 10 CFR 100.11 (for plants that have not implemented an alternative source term (AST)), or in 10 CFR 50.67 for plants that have implemented an AST. These are doses from immersion and inhalation of the passing plume and do not include groundshine.

100.11 criteria are 25 rem whole body and 300 rem thyroid (1) at the exclusion area boundary (EAB) for the first two hours after the accident, and (2) at the outer boundary of the low population zone (LPZ) for the duration of the accident.

50.67 criteria are 25 rem TEDE (1) at the EAB for the worst two-hour period after the accident, and (2) at the outer boundary of the LPZ for the duration of the accident.

The EAB is generally about 0.5 miles.

Michelle

-----Original Message-----

From: Basu, Sudhamay
Sent: Friday, August 24, 2012 12:09 PM
To: 'Osborn, Douglas'
Cc: Lee, Richard; Hart, Michelle
Subject: RE: [EXTERNAL] RE: 27 Case Results

I believe it is 5 rem TEDE at the controlled area boundary (minimum distance of 100 meters). I am copying this to few other folks so they can confirm or provide correction. You may also want to check with Dana, Nate, and others at your end. A further reference is 10 CFR Part 72.106(b).

-----Original Message-----

From: Osborn, Douglas [mailto:dosborn@sandia.gov]
Sent: Friday, August 24, 2012 11:02 AM
To: Basu, Sudhamay
Subject: RE: [EXTERNAL] RE: 27 Case Results

What is the DBA dose limit and at what location from the plant?

-----Original Message-----

From: Basu, Sudhamay [mailto:Sudhamay.Basu@nrc.gov]
Sent: Friday, August 24, 2012 8:44 AM
To: Osborn, Douglas
Cc: Ross, Kyle Wayne; Cardoni, Jeffrey Neil; Lee, Richard; Bixler, Nathan E
Subject: RE: [EXTERNAL] RE: 27 Case Results

Hi Doug,

What are you doing there today? I thought it's your day off. Thanks anyway for the explanation. I am on board but that said, I was posing the question in a more naïve way. That is, given your MACCS calculations, I know the dose etc. with a prescribed filter DF (2, 10, 100, and ...). Is the calculated dose, for example with a DF of 10, close to the DBA dose limit? Conversely, what filter DF would it take (for example, 12) to produce a MACCS calculated dose that is within the DBA dose limit? Don't know if my naïve way of thinking has any merit.

Sud

-----Original Message-----

From: Osborn, Douglas [mailto:dosborn@sandia.gov]
Sent: Friday, August 24, 2012 10:27 AM
To: Basu, Sudhamay
Cc: Ross, Kyle Wayne; Cardoni, Jeffrey Neil; Lee, Richard; Bixler, Nathan E
Subject: RE: [EXTERNAL] RE: 27 Case Results

I am not sure what the DBA scenario for Peach Bottom is for the LTSBO, but the way we are determining a DF should NOT be used to compare our MACCS2 results with the DBA. We only account for a DF reduction in the release fractions of the source term. Particle size distribution of the particulate source term is not taken into consideration.

If we were to model a water filter, the applicable DF that results will change the particle size distribution than what we are currently using for the source terms which is the original unfiltered source term particle size distribution. This change in particle size distribution will have an effect on the deposition of material and thus change our dose, LCF risk, land contamination, and economic estimates.

Also, depending on the type of filtered vent scenario, the accident progression results in an environmental release that is not through the wetwell or drywell vent path (e.g., RB blowout panels or RB roof failure); making the DF of the filtered vent more or less a non-issue since the majority of the source term will result in the bypass of the filtered vent paths.

Finally, depending on the metric used to determine your MACCS2 DBA results (e.g., LCF risk or economic costs), the DF you apply will not linearly extrapolate between metrics. A reduction to get your LCF risk below the DBA may not provide enough reduction for economic costs. This is due to the different variables of importance regarding the source term for each of the metrics considered.

Regards,
Doug

-----Original Message-----

From: Basu, Sudhamay [mailto:Sudhamay.Basu@nrc.gov]
Sent: Friday, August 24, 2012 8:11 AM
To: Osborn, Douglas
Cc: Ross, Kyle Wayne; Cardoni, Jeffrey Neil; Lee, Richard
Subject: RE: [EXTERNAL] RE: 27 Case Results

Thank you Doug for straightening me out. The question from NRR, you probably guessed, is what DF would it take to get an equivalent DBA dose using MACCS calcs. NRR ran RASCAL and their finding is it would take a DF of 5000 or more to get there.

-----Original Message-----

From: Osborn, Douglas [mailto:dosborn@sandia.gov]
Sent: Friday, August 24, 2012 7:38 AM
To: Basu, Sudhamay
Cc: Ross, Kyle Wayne; Cardoni, Jeffrey Neil
Subject: RE: [EXTERNAL] RE: 27 Case Results

Case 26 is Case 4 with DW sprays at 8 hrs.

Case 27 is my Case 18 (Case A3) with cycled venting.

Doug

-----Original Message-----

From: Basu, Sudhamay [mailto:Sudhamay.Basu@nrc.gov]

Sent: Thursday, August 23, 2012 8:29 PM

To: Osborn, Douglas

Subject: [EXTERNAL] RE: 27 Case Results

Doug,

I thought Case 26 is with cycled venting. What is it then? Can you please describe briefly cases 26 and 27?
Thanks.

From: Osborn, Douglas [dosborn@sandia.gov]

Sent: Thursday, August 23, 2012 6:12 PM

To: Basu, Sudhamay

Subject: 27 Case Results

Sud,

I just finished with Case 27, which is Case 18 (Case A3) with cycled venting.

Doug