HLWYM HEmails

From: Patrick Laplante
Sent: Thursday, December 13, 2007 12:14 PM
To: James Durham; Ali Simpkins
Cc: 'PA_Group'
Subject: TPA BDCF Distributions

Jim/Ali/others,

As a follow-on from our DOSE3 workshop last week, and with some valuable assistance from Osvaldo in developing a script to read/compile cumulative BDCF TPA code output into a usable format, I have generated a table of our current BDCF distributions from TPA 5.1 (groundwater scenario, pluvial, ICRP72, 300+ realizations) and placed it on my S drive for anyone interested. A copy was also handed to K. Compton. This form of information has not been compiled and charted for about a decade (last done in CNWRA 97-009 report).

For those not familiar with box and whisker plots the box represents the 25^{th} and 75^{th} percentiles and whiskers 10^{th} and 90^{th} with circles noting individual outliers beyond 10^{th} or 90^{th}. One notable difference from the prior chart is that, in general, the BDCF distributions include less variation and this is the expected result of the finalization of the NRC regulations that specify use of mean values for behavioral parameters (including consumption rates) as well as perhaps some residual reduction in variation by specifying some other parameters as constants to improve code efficiency. The larger amount of variation propagated to Tc99 results, for example, relative to other radionuclides, is representative of the “biological mobility” of Tc (it goes to all pathways and therefore result is based on more pathway models and thus sampled inputs than, for example, Nb94 which is mostly external dose (very limited # of inputs in simple pathway model).

The magnitude of values, in general, has decreased over the years as we have refined inputs and reduced excessive conservatisms (including update to ICRP72 dose coefficients). Also, in general, our mean values are somewhat lower than current DOE mean values, mostly because as we have been emphasizing “realism” (i.e., reducing excessive conservatism) over the past decade and they have continued to use conservative methods and assumptions as well as include additional models (e.g., swamp cooler, radon from soil, etc). So far, I haven’t noticed anything unusual or unexpected in this compilation of the output. A chart comparing our values with DOE values is in the works and will be made available when finished.

Thanks
Pat

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