

COMMENTS on DG-1053 (1999)

COMMENTS FROM:

Name: Alireza Haghighat

Organization: The Pennsylvania State University

Phone: (814) 865-0039

E-Mail: haghigha@gracie.psu.edu, or iaw@psu.edu

Fax: (814) 865-8499

CMT #	Page Number	Line Number	Paragraph Number	Comment	Recommended Corrective Action
1	2	30	4	It is stated that the methodology is adequate for BWR reactors. I believe this is not an accurate statement. Because of the axial variation of the void-fraction, the source and material distributions in a BWR require 3-D representations.	Either remove the statement, or add a footnote with regard to the need for 3-D source and material distributions.
2	3	13	2	How do you specify that a data base is "statistically significant"?	This statement has to be qualified.
3	6	14	2	The guide should not set a max. on the number of groups	Replace "(≥100-200)" with (≥100)
4	6	17	2	The guide should not set a max. on the number of groups	Replace "(≥50-100)" with (≥50)
5	6	29	3	The guide should not set a max. on the number of groups	Replace "(≤50)" with (~50)
6	6	footnote		The name "Radiation Shielding Information Center (RSIC)" is changed.	Present name is "Radiation Safety Information Computational Center (RSICC)"

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7	8	25	3	The guide should not set a max. on the number of angular intervals	Replace “at least 40 to 80 angular intervals” with “at least 40 angular intervals”
8	9	19	2	It is stated that “a coarse axial mesh of ~.5 interval per inch” is adequate. Such a large axial mesh may result in a large aspect ratio that may result in numerical oscillations.	The guide should provide a reference or supportive statement.
9	10	40-42	5	The statement “the input is generally....” is redundant. It has similar difficulties as it is encountered in preparing an input for the Sn deterministic calculation.	Remove the statement.
10	11	9-11	2	The statements “....introduce a bias in the flux estimate. If the size of the tally region introduces.....” are not accurate. The size of the tally region does not bias the value of a tallied quantity. Since Monte Carlo tallies are averaged over volume/area, different sizes provide different averages. To resolve this issue, more detailed tally cells should be used.	Revise these statements, by stating, for example, if the tally varies significantly in a tally volume, the tally volume has to be partitioned into sub-volumes for a more detailed tallying.
11	11	22	3	Word “reflecting” is not the common term.	It should be replaced with ‘reflective’
12	11	34-37	4	The statement “However, due to the finite....” is obvious and redundant, and may be misleading!	Remove the statement.

CMT #	Page Number	Line Number	Paragraph Number	Comment	Recommended Corrective Action
13	11	40-43	5	The statement “....., all statistical tests provided.....” is too strong. For example, the magnitude of VOV is very small, and generally it is very difficult to verify that VOV drops inversely with N.	It is adequate to state that the behavior of the relative error should be examined. For example, if the “central limit theorem” is used to estimate the relative error, it is necessary to examine that error drops inversely with the \sqrt{N} (N is the no. of histories).
14	12	10-11	1	The 5 th test is too stringent.	I believe that the statement should be removed.
15	12	20, 25	2	Misspelled word “talley”	Correct spelling is ‘tally’.
16	12	26-29	2	Verification of the variance reduction methods with an unbiased simulation is impractical/impossible.	The use of deterministic adjoint (“importance”) function should be recommended. For example, a version of MCNP called A ³ MCNP ^{TM1} utilizes the deterministic adjoint for variance reduction.
17	12	29-32	2	It is not adequate to examine the variance reduction techniques in 1-D. It may be misleading.	(same as comment 16)
18	13	3-4	1	Misspelled word “talley”.	Correct spelling is ‘tally’

¹A. Haghghat et al. “Performance of the Automated Adjoint Accelerated MCNP (A³MCNPTM) for Simulation of a BWR Core Shroud Problem, Proceedings of the M&C’99, Madrid, Spain, Vol. 2, 1381-1392, Sept. 27-Oct. 1, 1999.

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19	13	5-7	1	The energy cutoff is commonly used for situations that particle need not to be followed beyond the cutoff energy, hence, there is no biasing!	Remove the statement.
20	13	10	2	Misspelled word “talley”.	Correct spelling is ‘tally’
21	13	13-19	2	A version of MCNP called A ³ MCNP™ automatically performs source biasing within the weight-window technique.	Use Refs. 1-3 given on Page 6.
22	13	20-35	3	A version of MCNP called A ³ MCNP™ automatically performs transport biasing within the weight-window technique.	(same as comment 21)
23	13	36-41	4	A version of MCNP called A ³ MCNP™ automatically performs source and transport biasing within the weight-window technique.	(same as comment 21)
24	14	42	5	I appears that Eq. 3 refers to an Eq. in Reg. Guide 1.99. Is this correct?	If the answer is yes, I recommend that a word or two be added (e.g., ‘of this reference’)
25	15	3	1	What is “extrapolation parameters”?	The phrase should be explained
26	16	23	3	Through a recent OECD benchmarking activity, it is demonstrated that the results presented in Ref. 44 are inaccurate compared to 3-D calculations.	Use Refs. 4 and 5 on page 6. Also, add a sentence indicating that results of 3-D transport calculations are in close agreement with the experimental data.

CMT #	Page Number	Line Number	Paragraph Number	Comment	Recommended Corrective Action
27	17	4	1	What do you mean by “streaming component”? Do you refer to the “ray effect”?	Explain, or revise.
28	20	32	6	The recent OECD benchmark activity should be referenced.	Use references 4 and 5 on page 6.
29	20	footnote			A space missing between ‘Reference’ and ‘58’.
30	21	13-15	3		Refs. 4 and 5 on page 6 should be referenced.
31	22	6	1		A space missing between ‘the’ and ‘application’.
32	43			This page is missing!!	Add the page.
33	43	Ref. 32			Replace Ref. 32 with a more recent reference given in the footnote ²
34	45	Ref. 58		It has already been published.	Give the correct citation.

References

1. J.C. Wagner and A. Haghighat, “Automated Variance Reduction of Monte Carlo Using the Discrete Ordinates Adjoint Functions,” Nuclear Science and Engineering, Vol. 128, 186-208, 1998.
2. J.C. Wagner and A. Haghighat, “A³MCNP, Automated Adjoint Accelerated MCNP - User’s Manual,” The Pennsylvania State University, Revised Aug. 1998.

²B. Petrovic and A. Haghighat, “New Directional Theta-Weighted (DTW) Differencing Scheme and Reduction of Estimated Pressure Vessel Fluence Uncertainty,” Proceedings of the 9th International Symposium on Reactor Dosimetry, Editors: H. Ait Abderrahim, P. D’hondt, and B. Osmera, World Scientific Publishing Co., 1998.

3. A. Haghighat et al. "Performance of the Automated Adjoint Accelerated MCNP (A³MCNP™) for Simulation of a BWR Core Shroud Problem," Proceedings of the M&C'99, Madrid, Spain, Vol. 2, 1381-1392, Sept. 27-Oct. 1, 1999.
4. G. Hehn and B. C. Na, "New NEA Benchmarks reveal Decisive Improvements in Calculating fast neutron fluence for prediction of embrittlement in reactor pressure vessel," Reactor Dosimetry, ASTM STP 1398, J. G. Williams, D. W. Vehar, F. H. Ruddy, and D. M. Gilliam, Eds., American Society for Testing and Materials, West Conshohoken, PA, 2000.
5. A. Haghighat, H. Aït Abderrahim, and G.E. Sjoden, "Accuracy and Performance of PENTRAN™ Using the VENUS-3 Benchmark Experiment," Reactor Dosimetry, ASTM STP 1398, J. G. Williams, D. W. Vehar, F. H. Ruddy, and D. M. Gilliam, Eds., American Society for Testing and Materials, West Conshohoken, PA, 2000.