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Mar. 19, 2004

Dr. Andrew J. Murphy
Engineering Research Applications Branch
Division of Engineering Technology
Mail Stop: T-10D20
U.S. Nuclear Regulatory Commission
Rockville, MD 20555-0001

Dear Dr. Murphy,
This is our monthly letter status report for February, 2004.

Project Title: Evaluation of 2002 USGS National Seismic Hazard Assessment
Job code: Y6797
P.I.: Arthur Frankel
Period of Performance: August 2003-March 2004
Reporting Period: Feb. 1-29, 2004

Expenses in Feb. 2004 charged to the NRC project:
Estimated Salaries: $18,238.52
Estimated Assessments: $7964.77
Total for Feb. 2004: $26,203.29

Total spending to date: $172,358.66 (including assessments)
Remaining funds: approx. $25,641.34

The work this month involved (1) customizing the deaggregation procedure to the requirements of RG 1.165 Appendix C (2) adjusting the logic trees and assessing the effect on the results. We have found that the deaggregation of the median model can be

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very sensitive. In other words, the deaggregation of the median +1 model can be very different from the deaggregation of the median model. RG 1.165 requires finding the median model in each magnitude, distance bin, which is different from the usual USGS deaggregation procedure. We have modified our code accordingly.

We found that the logic tree we used for the smoothing parameter of the historic seismicity and for the completeness factors produced a small bias (about 15-20% in some cases) in the hazard values. We are investigating using other weighting schemes for these parameters, so that the mean seismicity rates and the mean hazard curves are not biased relative to those of the national seismic hazard maps.

We are also investigating different strategies for choosing models of the seismicity. Presently we use a 4-model draw, with the models being based on 1) magnitude 3 and above since 1924, 2) magnitude 4 and above since 1860, 3) magnitude 5 and above since 1700 and 4) background zones. Without varying the smoothing parameter results in very low values of the 15^{th} percentile hazard curve in many locations. This is caused by models 2 and 3 being very low in areas far removed from M4 and M4 earthquakes historically. We are looking into whether using larger smoothing values will change this undesired result. Another strategy we are considering is using a 2 model draw between a model based on the sum of the three modesl using spatially-smoothed seismicity and a model based on the background zones. We are currently evaluating the effects of these different strategies on the hazard curves and their estimated uncertainties.

Sincerely,

Arthur Frankel

cc: M. Mayfield, P. Cross-Prather, D. Dorman