

Summary of the Meeting of the Joint Benchmark Committee

June 1, 2003

San Diego, CA

The Joint Benchmark Committee (JBC) of the American Nuclear Society met on Sunday, June 1, in the Dover Room of the Town and Country Hotel and Convention Center in San Diego, CA. The meeting was called to order by JBC chair Barry Ganapol of the University of Arizona at approximately 11 a.m. Four other JBC members were present: Hamilton Hunter of Oak Ridge National Laboratory (RPSD co-chair), Russ Mosteller of Los Alamos National Laboratory (RPD co-chair), Steve Baker of Transware Enterprises (RPD member), and Richard Sanchez (MCD member) of CEA Saclay. It should be noted that approval of proposed benchmarks requires a minimum of seven JBC members voting in favor; this is the second consecutive meeting in which fewer than that number of JBC members have been present.

Fifteen other people also attended the meeting. They included Dick Amato of Bettis Atomic Power Laboratory, Yousry Azmy of Pennsylvania State University, Forrest Brown of Los Alamos National Laboratory, Bill Charlton of the University of Texas, Y. A. Chao of Westinghouse, Dimitri Cokinos of Brookhaven National Laboratory, Jess Gehin and Bernadette Kirk of Oak Ridge National Laboratory, Dale Lancaster of NuclearConsultants.com, Dom Napolitano of NISYS Corporation, Cassiano de Oliveira of the Imperial College, Abder Ougouag of Idaho National Engineering and Environmental Laboratory, Farzad Rahnema of the Georgia Institute of Technology, Glenn Sjoden of the University of Florida, and Hironobu Unesaki of Kyoto University.

The summary of the November 2002 meeting was approved by a voice vote.

Two new members of the committee have been appointed and a third has been re-appointed, each for three-year terms. The new members are Michael Smith of Argonne National Laboratory, representing MCD, and Bill Charlton, representing RPD. Enrico Sartori of the OECD NEA Data Bank has been re-appointed as a representative of RPSD. Russ Mosteller distributed a matrix of the JBC members, organized by division and last year of membership on the committee. A few days after the meeting, Nolan Hertel resigned as an RPSD member and has been replaced by Dom Napolitano. An updated matrix of JBC members is attached. Any further changes or corrections to that information should be reported to Russ.

The question arose as to how the existence of JBC benchmarks could be publicized. It was suggested that the JBC benchmarks should be discussed in the newsletters of the three sponsoring divisions. Another suggestion was to write letters to the editors of ANS journals, specifically *Nuclear Science and Engineering*, to publicize their existence. Barry volunteered to check with the editor of *Nuclear News* to see if there might be interest in a short article on the JBC or at least in publishing a letter to the editor on that topic.

Along the same lines, it was suggested that the benchmark website at the Radiation Safety Information Computational Center (RSICC) should include links to other websites related to benchmarking. Ham said that he will add links to the MCD website, the Cross Section

Evaluation Working Group (CSEWG) website, and the Japanese Atomic Energy Research Institute (JAERI) website. Suggestions for links to additional websites should be sent to Ham at hunterht@ornl.gov. Ham also reported that the RSICC benchmark site had more than 4,500 hits during the first three months of 2003.

The question also arose as to whether, in addition to the benchmark specifications themselves, solutions to those benchmarks that are submitted to the JBC should be posted on the websites at RSICC and the Nuclear Energy Agency (NEA). After some discussion, a consensus was reached that the submission forms should contain a checkbox in which respondents submitting a solution could indicate their preference. It also was decided to permit revised solutions to be submitted.

The subject of wellness of fit, which had been discussed briefly at the previous JBC meeting, was discussed again. Ham suggested that some metric should be devised to measure the level of agreement between measured and calculated results for benchmarks. He felt that such a metric would be a useful guide for people who use the benchmarks to validate their methods. Russ responded that, at least for reactor-physics benchmarks, the criterion for acceptance traditionally has been the quality of the experiment rather than agreement between experimental and calculated results. He pointed out that good benchmarks which don't produce good agreement with calculations often highlight deficiencies in codes or nuclear data. No final consensus was reached on this subject.

The following items also were discussed, but they are presented by division rather than in the order of discussion.

RPD Items

- (1) Barry reported that the set of three light-water-reactor (LWR) lattice benchmarks that had been submitted for approval as JBC benchmarks at the November meeting had been approved by e-mail vote. Members who voted to approve the benchmark are Steve Baker, Barry Ganapol, Bill Hopkins, Ham Hunter, Dick McKnight, Russ Mosteller, Charles Rombough, Richard Sanchez, and Enrico Sartori. The benchmark specifications and the submitted solutions will be posted on the RSICC and NEA websites.
- (2) Russ briefly discussed the special session he organized for this ANS meeting, "ANS Joint Benchmark Committee Benchmarks and Related Efforts." The session has eight papers, and there is at least one paper in the subject area of each of the three divisions. The session will be held on Monday afternoon.
- (3) Professor Unesaki gave a presentation on "Update Status of Benchmark Activity for Reactor Physics Study of LWR Next Generation Fuels," and he distributed copies of his VuGraphs. He will make the same presentation at the special session Monday afternoon. His presentation summarized the progress that has been made by the Working Party on Reactor Physics for Next Generation Fuels, which has been organized by JAERI. In addition to specific benchmark problems, his presentation also discussed other related

activities, including post-irradiation analyses of high-burnup fuel samples and experimental results from the VENUS-2 and MISTRAL critical experiments.

- (4) Steve Baker presented a summary of some sensitivity studies he has performed for an isotopics benchmark that he and other members of a working group are preparing. The benchmark is based on measured isotopics of fuel pins removed from a lead test assembly in Calvert Cliffs Unit 1 after three and four cycles of irradiation. Steve has obtained some encouraging preliminary results, and he expressed the hope that sufficient progress will be made for the JBC to vote on this proposed benchmark at its next meeting. He also will be presenting these results in the special session Monday afternoon.

RPSD Items

- (6) Ham discussed the progress on the new release of the SINBAD database. SINBAD includes CSEWG shielding benchmarks, Nuclear Energy Agency (NEA) shielding benchmarks, and a set of fusion benchmarks.
- (7) Ham also briefly discussed a potential pressure-vessel benchmark for H. B. Robinson Unit 2. The original plan was to include it as a benchmark in SINBAD, but unfortunately that did not happen. Instead, Ham would like to submit it for approval as a JBC benchmark, ideally at the next JBC meeting. The proposed benchmark can be reviewed at <http://www-rsicc.ornl.gov/BENCHMARKS/hbrobinson.html>, and a working group may be formed to review it in detail. Anyone who has comments on the proposed benchmark or would like to join the working group can contact Ham at hunterht@ornl.gov. Those who wish to perform calculations should contact Ham for additional information.

MCD items

- (8) Barry handed out an outline of a document describing a set of analytical, steady-state, infinite-medium benchmarks that he would like to submit (eventually) to the JBC for approval. Richard Sanchez questioned whether such benchmarks are useful when all modern calculations are performed on computers. Forrest Brown responded that the development team for the MCNP Monte Carlo code maintains a suite of similar benchmarks for verification purposes. The committee encouraged Barry to prepare the document and to submit it to the JBC for review.

Barry adjourned the meeting at approximately 1 p.m. and invited those present to a cocktail reception at 6:30.