INTERNATIONAL CRITICALITY SAFETY BENCHMARK EVALUATION PROJECT
INL
- Representatives from the ICSBEP participated in the NDAG and CSEWG Meetings in November and in NCSP 10-Year-Vision activities in October and November.
- ICSBEP participants focused on new evaluations that will be submitted to the annual ICSBEP Technical Review Group Meeting.
- Arrangements for the annual ICSBEP Technical Review Group Meeting were solidified. This meeting will be held in Prague, Czech Republic, 5 – 9 May 2008.

ANALYTICAL METHODS DEVELOPMENT AND CODE SUPPORT
ANL
- Collaboration is ongoing with BNL, Petten and Vienna to implement the Monte Carlo-based methodology for evaluation of covariance data (D. Smith).
- Code comparisons with MCNP based on a validation suite of ICSBEP FAST- and INTER-systems have been completed (R. Blomquist).
- Progress on improved numerical reliability in collision physics (which is increasingly important due to the large number of histories in standard Monte Carlo analyses).

LANL
- Presented the class "Introduction to MCNP" at Los Alamos during the quarter.
- Participated in OECD NEA Working Group on Nuclear Criticality Safety and the Expert Group on Source Convergence ("Status of MCNP5 Criticality Calculations Convergence, Acceleration, and Dominance Ratio" [LA-UR-07-5506]).
- Tested MCNP5 1.50 and ENDF/B-VII neutron and $S(\alpha,\beta)$ libraries. Identified and corrected a few minor deficiencies.
- Published two reports on advanced MCNP criticality methods for dominance ratio calculations [LA-UR-07-5462 and LA-UR-07-6637].
- Responded to initial user feedback on incorporation of ERRORJ covariance processing module in NJOY.
- Converted all NJOY modules (except ERRORJ) into Fortran 90 and initiated testing.
- Developed tutorial material for NJOY workshop to be presented at ICRS11/RPSD2008.

LLNL
- Participated in the CSEWG and USNDP meetings at BNL.
- Completed the criticality safety evaluation supporting WR1 casting (a Defense Program Level 2 Milestone) using COG10 due to geometric complexity and COG compatibility with PRO-E numerical contour design data.
- Beta testing of COG11 with ENDF/B-VII.0 data continuing.

ORNL
- Completed and distributed FY 2007 annual SCALE maintenance report.
- Provided 180 responses to users requesting technical assistance.
- SCALE 5.1 KENO workshop completed October 2007.
- Special SCALE session and SCALE Monte Carlo workshop presented at ANS Winter Meeting.

- SCALE development and website maintenance (www.ornl.gov/sci/scale):
  - Development of automated benchmark testing for CE-KENO and MG-KENO in progress.
  - Updates on 14 SCALE modules, data and program libraries for SCALE 6.
- AMPX Maintenance and Library Generation:
  - Produced updated CE and initiated MG ENDF/B-VII.0 libraries for testing with SCALE 6.
  - Updates to correct Bondarenko factor generation and fission spectrum processing for MG library generation.
  - SCALE 5.1 covariance library updated to include new Atlas of Resonance parameter data for approximate covariance files.
- Spatial mesh needed for TSUNAMI calculations was added to KENO-VI.
- RSICC activities (see rsicc.ornl.gov for monthly newsletters):
  - Distributed 525 software packages and updated 8 software packages.
  - 104 SCALE & 160 MCNP packages distributed.
  - Electronic notebook entries for SCALE and MCNP.
  - RSICC quarterly report issued.
- TSUNAMI analysis of IRSN structural experiments was documented in letter report to NCSP and IRSN. ORNL met with IRSN in Washington and again in Paris to discuss results and plan further collaboration.
- ORNL participated in first meeting of OECD Expert Group on Uncertainty Methodology for NCS.

NUCLEAR DATA
ANL
- Participated in Nov 2007 CSEWG meeting, including organizing and chairing new Covariance Committee (D. L. Smith), chairing Data Validation Committee (R. D. McKnight), providing summary of committee meetings, and presenting data testing results using ENDF/B-VII.0 data library.
- Leading (D. L. Smith and Y-S. Yang) the technical discussion to resolve issues with the ENDF/B formats for covariance data for fission spectra.
- Participated in NEMEA-4 Workshop (4th Workshop on Neutron Measurements, Evaluations and Applications) and in OECD/NEA WPEC Subgroup-26 (SG-26) on nuclear data needs which is heavily involved in generation and use of covariance information for criticality safety applications.
- Participated in the initial meeting of the OECD/NEA Expert Group on Uncertainty Analyses for Criticality Safety Assessment (UACSA).
- Organized and chaired November 2007 NDAG meeting.
- Provided NDAG review and input for 4 Integral Experiment Requests (IERs).
- Participated in NCSP Task Force to produce the new Ten-Year Mission and Vision document.
- Organized and provided NDAG responses to NDAG Tasks 2007-3 (Differential Nuclear Data Measurement Options) and 2007-4 (Review of Draft NCSP Vision Document).
- Participating in Task Force for Preserving the ZPPR Materials.

BNL
- Produced low-fidelity covariances for remaining 88 isotopes (structural materials and heavy materials) in the fast neutron region. The results were sent to ORNL for merging with the low energy data.
- Continued collecting new evaluations for ENDF/B-VII.1. Evaluations are available under ENDF/A on the ENDF library website.
- Organized the CSEWG annual meeting on November 6-8, 2007 at BNL, and hosted NDAG meeting on November 5, 2007.

LANL
- Participated in NDAG and CSEWG meetings at BNL in November. Reported validation test results, progress on new libraries, and plans for next release of ENDF/B-VII.
- Completed the production of low-fidelity covariances in the fast neutron range for 46 actinides and transmitted to ORNL. Data include uncertainties for nubar and covariances for total, elastic, fission, inelastic, and capture cross sections above 5 keV.
- Constructed covariances for the light-element standards ^{1}H, ^{6}Li, and ^{10}B, as well as for ^{19}F. Covariances have been propagated from those of the R-matrix parameters used to determine the evaluated cross sections. These covariance evaluations are complete in the sense that they cover the entire energy range.
- Published journal article "Evaluation of Neutron Reactions for ENDF/B-VII: $^{232-241}$U and ^{239}Pu" in Nuclear Data Sheets [Nucl. Data Sheets 108, 2591-2656 (2007)].
- Performed coupled-channels optical model calculations for ^{235}U using Sukovitskii potential with the ECIS code, to assess usefulness of the potential and to produce improved (n,n') cross sections and neutron transmission coefficients.
- Performed GNASH calculations for Ti isotopes. Results will be translated into ENDF-6 format for integral data testing.

ORNL
- Initiated collaboration with IAEA to perform high-energy cross-section evaluation to complete ENDF/B data file for ^{55}Mn.
- Initiated efforts to determine appropriate File 33 energy boundaries to preserve resonance covariance information in conversion of File 32 covariance into File 33 for ^{233}U, ^{235}U, ^{238}U, and ^{239}Pu.
- Completed ^{19}F resonance parameter analyses using Russian inelastic measured data—internal testing in progress.
- Completed investigation of ^{39,40,41}K data normalization issue and evaluations.
- Journal articles submitted to NS&E for ^{232}Th and ^{238}U evaluation work.
- Interacted with ANL on improved URR evaluation methodology.
- Mike Dunn chaired ENDF/B Formats Committee Meeting November 7, 2007 at CSEWG.
- Dunn, Luiz Leal, and Nancy Larson participated in NDAG meeting November 5, 2007.
- Dunn identified as member of U.S. ENDF/B contingent to participate in WPEC meeting in June 2008.

- Opened job position at ORNL to hire nuclear data staff that could work to implement SAMMY transition plan.

- Dunn, Leal, and Larson participated in the CSEWG meeting November 6–8, 2007.
- Completed ORNL/TM report on ENDF/B-VII ^{233}U cross-section data update for SCALE 5.1.
- Leal visited IAEA in November 2007 to perform nuclear data evaluation collaboration work for ^{55}Mn and tungsten.
- December 3–6, 2007, Leal participated in IEA-R1 reactor Workshop in São Paulo, Brazil—gave presentation on resonance region analyses methodology and met with IEA-R1 staff to discuss integral measurement capabilities to support NCSP evaluation efforts.
- Issued updated SAMMY package for use on internal evaluations.

DIFFERENTIAL MEASUREMENTS
ORNL
- Completed ^{52}Cr transmission and capture measurements.
- Completed ^{58,60}Ni capture measurements.
- Completed reliable ORELA operation for ~300 hours with power level ~5 kW, 525 Hz frequency, 8 ns pulse width, and 10^{-8} torr vacuum.

INTEGRAL EXPERIMENTS
INL
- The contract for NCSP collaboration on the IRSN Matériaux Interaction Réflexion Toutes Epaisseurs (MIRTE) Program was signed by INL in October and IRSN in November of 2007.
- The NCSP Manager, an NCSP Staff member, and the ICSBEP Task Manager traveled to the IRSN offices in Paris, France and participated in the first programmatic meeting on the MIRTE Program in November of 2007.
- IRSN certified on 11 December 2007 that the safety documentation, component design, and experimental device manufacture was completed. This represents completion of the first FY2008 Milestone.

LANL
- Successfully supported all required DAF TSR surveillances, maintenance activities.
- Manufactured the Lucite shells necessary for executing the BRP ball – Lucite subcritical experiment:
  - Executed a dry run of the Lucite experiment with ORNL personnel verifying successful technology transfer with regard to subcritical noise technique.
- Supported various NCSP planning activities including 5-year and 10-year vision development.
- Supported NDAG and other NCSP tasks as required.

ORNL
- T. Valentine traveled to DAF for week-long evaluation of LANL staff for proficiency in performing subcritical noise analysis measurements.
- Proficiency checklist prepared for evaluation of LANL experimental staff in performance of subcritical noise measurements.

INFORMATION PRESERVATION AND DISSEMINATION
Fluor Hanford
ARH-600
- The review of the CritView beta review package is complete, and CritView is ready for release on the NCSP web site.

55-GALLON DRUM
- Approach was drafted.
- Internal testing of question set is underway.

LLNL
- Deployed revision two of the online Request for Integral Experiments form (CED-0).
- Created dedicate backup script to IER form database.
- Continuously enhance NCSP website menu and web pages.
- Developed NCSP online survey forms (80 percent done). Will be deployed in the end of February.

ORNL
- The ORCEF Heritage is in final editing and DVD production by the ORNL Visual Instrumentation department. Final version contains 11 sessions with 32 topics and several hundred subtopics.
- Contract extended for former Oak Ridge Electron Linear Accelerator (ORELA) Director to edit seven sessions of recording for the ORELA Heritage video.

TRAINING AND QUALIFICATIONS
LLNL
- Completed a class on 12/06/2007.
- Completed a class on 12/11/2007.
- Developed and deployed a second neutron detector built from surplus LLNL parts with new electronics. This detector is user-friendly and operated by simply pushing one button without computer interface.

ORNL
- Continued revisions to TSUNAMI primer.
- Initial draft of NCSET module for subcritical noise analysis is near completion.

NUCLEAR CRITICALITY SAFETY PROGRAM SUPPORT
ANL
- Development of the NCSP vision statement.
- The CSSG meeting held at the November 2007 ANS meeting.
- Several teleconferences about the disposition of the ZPPR materials.
- Initial planning for the April 2008 CSSG meeting.