NCSP Activities and Accomplishments in FY12

Analytical Methods

LANL AM:
- MCNP6 was shipped to RSICC for general beta distribution.
- The latest version of NJOY2010 was shared with ORNL.
- The new NJOY2010 Manual was completed and sent to LANL's Technology Transfer department.
- A new MCNP continuous library was completed and an ANS summary submitted.
- MCNP Continuous-energy Sensitivity Coefficient Capability: newly developed and incorporated in MCNP6; slated for release in next beta version; comparisons to OECD/NEA WPNCS sensitivity / uncertainty benchmarks in progress.
- Organized Monte Carlo Workshop at PHYSOR-2012; contributions from LANL, BNL, Michigan, and BAPL; available on MCNP website as LA-UR-12-20397.
- Five Papers Presented at PHYSOR-2012: "Impact of Delayed Neutron Precursor Mobility in Fissile Solution Systems," "Temperature Effects of Resonance Scattering for Epithermal Neutrons in MCNP," "Comparison of Discrete and Continuous Thermal Neutron Scattering Treatments in MCNP5," "Chord Length Sampling Method for Analyzing VHTR Unit Cells in Continuous Energy Simulations," and "Preliminary Tests of a 3rd Monte Carlo Neutron Transport Code for Reactor Analysis Using Nvidia C2050 Gpu Card and Cuda Environment."
- Presented papers at ANS Meetings on MCNP and MCNP data libraries:
    - "MCNP Developments", F.B. Brown & B.C. Kiedrowski, invited paper for session on NCSP Accomplishments, LA-UR-11-03736
    - "MCNP6 Shielding Validation Suite: Past, Present, and Future", B.C. Kiedrowski, F.B. Brown, N.A. Gibson, A.S. Bennett, M.A. Gonzales, LA-UR-11-03719
- Gave three invited talks at the ANS Winter Meeting workshop on "Neutron Cross Sections for Nuclear Engineers."
- NJOY Development and Support: updated covariance processing routines to handle evaluated files with multiple angular distribution data sets; provided end-user NJOY consultation to LANL and external users.
- Report prepared on MCNP6 results for the OCED/NEA sensitivity/uncertainty benchmarks. Comparisons to other codes such as TSUNAMI and MONK.
- Issued report on MCNP5 & MCNP6 verification/validation and computer performance: F.B. Brown, B.C. Kiedrowski, J.S. Bull, "Verification of MCNP5-1.60 and MCNP6-Beta-2 for Criticality Safety Applications," LA-UR-12-21041 (2012).
- Mentoring 3 PhD students, working on fission matrix for criticality calculations, alpha eigenvalues, and MCNP6 mesh features.
- Journal Articles: G. Yesilyurt, W.R. Martin, F.B. Brown, "On-The-Fly Doppler Broadening for Monte Carlo Codes," Nucl. Sci. Eng. 171, 239-257 (2012). B.C. Kiedrowski & F.B. Brown, "Adjoint-Based k-Eigenvalue Sensitivity Coefficients to Nuclear Data Using Continuous-Energy Monte Carlo," submitted to Nucl. Sci. Eng. (2012).
- Issued tutorial report on using MCNP for analyzing criticality alarm systems (Kiedrowski, LA-UR-12-25545).
- Presented LANL report on continuous-energy sensitivity-uncertainty analysis at OECD/NEA Expert Group meeting (Kiedrowski, LA-UR-12-25560).

- Provided direct consultation and support for time-critical calculations (a) with LANL criticality safety group for TA-55 vault, and (b) with Pantex for subcritical multiplication experiments.
- Conducted hands-on MCNP class at SNL for 15 criticality-safety practitioners in Sept.
- Criticality-safety relevant improvements to MCNP5 and MCNP6 included parallel threading and MPI usage, periodic V&V, and bug fix in continuous S(a,b) treatment.
- Published 4 LA-URs on R&D for Monte Carlo criticality calculations, 1 LA-UR on general Monte Carlo methods, and 1 LA-UR on ENDF/B-VII.1 data testing. In addition, MCNP S/U paper was accepted by NSE.
- A beta release of the nuclear cross section library based upon ENDF/B-VII.1 is available at LANL.
- Presented 2 on-site MCNP criticality classes, "Theory & Practice of Criticality Calculations with MCNP5."
- Provided NJOY and MCNP support to external users.

LLNL AM:

- JEFF-3.1.2 continuous cross-sections and URR probability tables implemented in COG11.1.

- Completed a new equation-of-state table and thermo-mechanical properties for solid-solid phase transformations of HEU for high-fidelity LLNL multi-physics simulations.

- Successfully implemented a restart capability for the LLNL multi-physics code.

- Distributed POINT 2012 library of temperature dependent point-wise continuous ENDF/B-VII.1 cross-section data processed with PREPRO to IAEA and RSICC.

- POINT 2012 data is available on-line from IAEA, http://www-nds.iaea.org/point2012/; and, LLNL, http://cog.llnl.gov/point2012.html.

- POINT 2012 data is also available from ORNL as RSICC Data Library DLC-251, "POINT 2012: ENDF/B-VII.1 Final Temperature Dependent Cross Section Library."

- IRDF-2002 data processing in support of CEA/ORNL CAAS benchmark.

- JEF-2.2 S(a,b) data implemented in COG enabling "like-for-like" comparison of AWE MONK benchmark results to LLNL COG results in support of a JOWOG-30 activity.

- New equation-of-state and thermo-mechanical properties for solid-solid phase transformations of HEU in progress.

- Published "Software Requirements Specification for COG11.1" in accordance with requirements of the LLNL Institutional Software Quality Assurance Program.

- Distributed POINT2011 Beta 4 library of temperature dependent point-wise continuous ENDF/B-VII.1

- 4 cross-section data processed with PREPRO. This data is available to the public from RSICC as "DLC-247/POINT2011 Beta 4."

- Completed the Juliet Preliminary Design (CED-1) Report that included calculated fission yields, power histories and temperature data for a range of excursions with comparison to

published GODIVA-1 measured data. The report also includes calculated surface motion but no measured data are available.

- IRDFF1.02 (update of IRDF-2002) international reactor dosimetry data file implemented in COG11.1 in support of IER-126 (CAAS benchmark)

- COG11.1 validation testing completed for: ICSBEP criticality benchmarks, SINBAD shielding benchmarks, CAAS activation benchmarks, PNUC coupled e, γ, n benchmarks, DFG fission product delayed γ benchmarks.

- COG geometry and materials successfully implemented and executed in ARDRA (automatically) using standard COG input with add-on S_N control data parameters.

- Participated in the OECD WPNCS expert group meeting on excursion analysis in Paris on September 19, 2012.

ORNL AM

- Distributed 1289 software packages and updated 28 software packages.
- 240 SCALE and 1022 MCNP packages distributed.
- FY 2011 *SCALE Annual Maintenance and Development Report* issued December 29, 2011.
- Published ORNL/TM-2011/450, *Criticality Safety Validation of Scale 6.1*, examining the performance of SCALE 6.1 with multigroup and continuous-energy ENDF/B-VII.0 data for 300 ICSBEP experiments modeled under SCALE QA procedure.
- New SCALE Software QA electronic framework established within the FogBugz collaborative development environment.
- Processed ENDF/B-VII.1 Beta evaluations from NNDC in preparation for final release of ENDF/B-VII.1 in December 2011—performed data testing with ENDF/B-VII.1 Beta evaluations.
- SCALE Training courses were arranged with 5 courses scheduled in US and Europe.
- Added functionality to provide total scattering data to CE library based on MG data.
- SCALE 6.1.1 patch released, including several important updates in codes and nuclear data.
- Updated continuous-energy processing modules based on verification and validation testing.
- Generated new continuous-energy ENDF/B-VII.0 library for SCALE with updated treatment for scattering matrices. Testing currently in progress.
- Updated SCALE to generalize flux moment mesh tally calculation to make the needed subroutines available for both criticality safety (KENO V.a and –VI) and fixed-source transport (MAVRIC/Monaco)—capability needed by Monaco Monte Carlo code to calculate sensitivity profiles for fixed-source problems.
- Added various new modules to handle collision kinematic data in support of calculating the total scattering matrix.
- Implemented correction for up scatter data that previously led to nonphysical oscillations in the problem-dependent CE flux calculated by the CENTRM module in SCALE.
- Added new input templates to the AMPX Graphical User Interface (GUI), ExSite, to provide new unit and transmission data testing inputs for SCALE CE data libraries.

- Modified and successfully tested the SCALE MAVRIC sequence to run adjoint Monaco calculations.
- Implemented methodology analogous to the Consistent Adjoint Driven Importance Sampling (CADIS) capability to accelerate adjoint Monaco calculations.
- Presented AMPX status report at November 2011 CSEWGRSICC activities: See rsicc.ornl.gov for monthly newsletters.
- Participated in OECD/NEA Working Party on Nuclear Criticality Safety and associated expert group meetings.
- Enhanced SCALE quality assurance program developed to provide improved software quality assurance, streamlined workflow and compliance with ISO 9001 standards.
- Performed extensive verification and validation studies using the SCALE CE libraries— identified and implement improvements in the AMPX probability table generation capability for the unresolved region.
- Generated revised ENDF/B-VII.0 SCALE CE libraries with the updated probability tables— updated CE libraries will be released with SCALE 6.2 in FY13.
- Generated prototypic ENDF/B-VII.1 CE, MG, and covariance libraries for internal testing at ORNL.
- Completed development of a prototypic fixed-source sensitivity/uncertainty analysis capability in SCALE for CAAS analysis.

Integral Experiments

ANL IE

- Provided NDAG review of all new IERs.

- Provided mentoring role on design analysis of IERs.

- Reviewed all available CED-1's with ANL participation on $C_E dT$ team and distributed specific comments to all $C_E dT$ team members.

- Provided comments for completion of ICSBEP publications.

LANL IE
- Supported Flattop Startup

- Completed Flattop startup.

- All of the currently qualified critical assembly operators and the pool of potential new operators completed the biennial examination and oral boards that are part of the qualifications to be a NCERC critical assembly operator.

- Put together a summary for presentation at the NCSP FY12 technical seminar and for presentation at the ANS summer meeting comparing capabilities of the current mainstream MCNP-based codes, MCNP5 and MCNPX/MCNP6, MCNP-DSP and MCNPX-PoliMi and their utilization for analysis of sub-critical systems.

- Gave talk at the October 2011 Nuclear Explosive Design Physics Conference (NEDPC) to present NCERC capabilities and planned applications ("Planning for NCERC Experiments for Stockpile Stewardship and Global Security," LA-CP-11-01339).

- Gave talk at the November 2011 American Nuclear Society meeting describing NCERC capabilities and planned applications ("Planning for NCERC Experiments for Stockpile Stewardship and Global Security," LA-UR-11-06282).

- Delivered draft Jezebel re-evaluation to ICSBEP.

- Completed the Independent Review of two ANL ICSBEP evaluations and recommended publication of same.

- Completed the assembly of Godiva and established Godiva operations (setting the safety block gap).

- Supported Independent Review Team assessing the anomalous behavior on Planet and Comet. Provided hands-on support for trouble shooting and executed temporary modifications requested by the review team.

- Supported an Office of the Inspector General audit of the TA-18 relocation project.

- Supported non-NCSP activity – N-POD certifications.

- Maintained NCERC operability. All surveillances, ISIs, and preventive maintenance were completed on schedule.

- Performed two independent reviews for ICSBEP and attended annual meeting in May.

- The code comparison for subcritical calculations has been enhanced with simulations from additional experimental configurations (0.5", 1" and 1.5" HDPE-reflected cases) and a comparison of the simulation results subjected to changes in window widths has been completed. A presentation to discuss the results of the comparison at the ANS winter meeting.

- Operational anomalies associated with the Planet and Flattop assemblies were successfully diagnosed. Changes were made to the assemblies to mitigate future occurrences.

- The DUFF (**D**emonstration **U**sing **F**lattop **F**issions) experiment was successfully executed. This was a LANL/NSTEC/NASA collaboration to demonstrate how one can use a compact reactor in conjunction with a heat pipe and a sterling engine to generate electricity as a proof of principle measurement for deep space power applications.

- Another foil irradiation was performed using Comet for the NCNS project. This was a collaborative effort between LANL/NSTEC/PNNL for nuclear forensics studies.

- Maintenance of current qualifications of currently qualified crew members and crew chiefs was performed.

LLNL IE:

- Continued active participation in the working group for ANSI/HPS-N13.3-2012, "Dosimetry for Criticality Accidents."
- COG modeling of the first CAAS benchmark.
- Presented the results of TEX preliminary calculations at the NDAG meeting at BNL.
- MIRTE-1 independent and TRG review meeting scheduled at IRSN.
- VNIITF issued Quarterly Technical Report (Q26) for ISTC Project Report No. 3110 indicating VNIITF received Mo plates.
- Completed design, fabrication and initial calibration of a hybrid high-energy neutron time-of-flight spectrometer.
- Procured long lead items for NAD Lab such as moveable shielding, work benches and fume hood.
- Participated in the working group meeting on ANSI/HPS-N13.3-2012, "Dosimetry for Criticality Accidents," at the Health Physics Society Midyear meeting.
- Provided a draft AWE/NNSA JOWOG-30 detailed task specification for criticality safety to the NCSP Manager and attended a JOWOG-30 meeting.
- Completed the IWS, RWP, NEPA checklist, and facility characterization for the NAD Laboratory at Mercury, NV, as a radiological facility and established a radioactive materials area (RMA).
- Completed the TEX Preliminary Design Report.

NNSS IE:

- Supported NCERC Planet operations, Nuclear Material Handling & Measurement (NMH&M) material moves and TACS program (MC&A) validation and verification (V&V) activities.
- Performed WPI-051 to baseline annual surveillance of NCERC building functional test of each detector system and control circuitry.
- Supported material moves and necessary activities to prepare for startup of the Flattop critical assembly machine.
- Completed initial critical operations for the Flattop critical assembly machine.
- Conducted Planet operations.
- Conducted ER training classes.
- Received Nevada Site Office (NSO) comments for the Documented Safety Analysis (DSA) Addendum/Technical Safety Requirements (TSR) Change Notice 5 for Godiva Assembly, addressing both NSO comments and LANL concerns over results of the first Criticality Control Review (CCR) of the Criticality Safety Evaluation (CSE) for this activity.

- Developed draft response to NSO comments for DSA Addendum/TSR change notice 5 for Godiva assembly and continued work with LANL to address their concerns over results of the Criticality Control Review of the Criticality Safety Evaluation for the activity. Submitted NCERC safety basis CN5 to NSO for approval in February 2012; received SER the week of March 26.

- Developed briefing for CEF (NCERC)-TSR-1 CN5 related to Godiva assembly activities. Began presentations on 4/11/12. DAF DSA Addendum for NCERC Operations, Rev. 1, CN5, and CEF (NCERC)-TSR-01, Rev. 1, CN5 Safety Basis Implementation and IVR were completed. The TSR controls were declared effective.

- Performed verification and validation of Godiva assembly procedure.

- Completed Godiva core assembly and restoration activities.

- Completed set-up of Training Assembly for Criticality Safety classroom in a new building.

- DAF personnel attended Critical/Sub-critical Experiment Design Team (CeDT) Training for NCERC.

- DAF-JCO-09-01 (FSS JCO) was revised, implemented, IVRd, and made effective to support planned operations.

- Supported NCERC/NMO TACS training class.

- Continued support of firmware updates for NCERC Cost Account Managers.

- Prepared Warehouse CP-150 for receipt of INL ZPPR plates. This effort included coordination of REOP, MC&A, RMA, and Hazard Categorization documentation.

- Supported the Entrance Conference (initial survey) for the NCERC Inspector General audit. The purpose of this audit was to determine whether the NNSA has restored the capability to perform criticality experiments at the NNSS NCERC in a safe and effective manner.

- Supported the Office of Inspector General NCERC Audit Site Visit. Meetings were held on 6/25 and 6/27, and a NCERC facility tour was conducted on 6/26. The meetings included Q&A sessions on Capability Management, Safety Basis Management, Federal Oversight, Assessments, Staffing, and Training.

- The U-233 Project (Accelerated Shipment of U-233 for future NCSP experiments) completed the following activities in the 1st quarter:

  o Completed procedures for receipt, unpacking, and repackaging of the special nuclear material (SNM).

  o Conducted a Criticality Control Review (CCR).

- The U-233 Project (Accelerated Shipment of U-233 for future NCSP experiments) completed the following activities in the 2nd quarter:

  o Received and processed 12 shipments of U-233 fuel plates.

- Completed all FY12 U-233 scheduled shipments. The final shipment was received in June 2012.

- Supported active operations for Nuclear Material Handling and Measurements (NMHM) and post-maintenance testing for National Criticality Experiments Research Center (NCERC) continuous air monitor (CAM) troubleshooting.

- National Aeronautics and Space Administration (NASA) visitors for the Demonstrations Using FLATTOP Fissions (DUFF) Experiment were provided a status briefing and observed the successful completion of experiment activities. Support for this experiment included the installation of a temporary modification to an electrical breaker.

- Supported non-NCSP NCERC activities: N-Pod certifications, Emergency Response (ER) training classes, DTRA measurements, and various miscellaneous support efforts.

- Prepared Warehouse 23-703 for LLNL's Nuclear Accident Dosimetry (NAD) Laboratory. Preparations included major renovations to the Hood/storage Room, Counting Lab, office space, and conference room.

ORNL IE:

- Worked closely with LANL staff to provide AM support for IERs.

- Made significant progress on sensitivity/uncertainty (S/U) analyses needed for IERs.

- Initiated work to address AM computational analysis needs for IERs.

SNL IE:

- Updated the operator proficiencies and the readiness of the facility.

- Two Sandians supported the CSSG as ad hoc team members in an independent review of Godiva safety.

- The LEU-COMP-THERM-080 evaluation for the 0.800 cm pitch 7uPCX configurations was finalized and submitted to the ICSBEP for external review.

- Sandia reviewed change notice 4 of the NCERC DSA appendix and TSRs at the request of NSO.

- Sandia provided support to the NCERC on the control system issue.

- The LEU-COMP-THERM-080 evaluation for the 0.800 cm pitch 7uPCX configurations was successfully defended at the ICSBEP meeting and submitted for publication.

<div align="center">Information Preservation and Dissemination</div>

ANL IP&D:

- A summary report of the sample structure for the archived ZPR/ZPPR data, including a listing of files already archived, was completed and delivered to the IP&D manager for posting.

- Archival records on ZPR/ZPPR materials have been reviewed and a sample electronic database format with catalog, index, keywords and search capability has been created from a representative sample.

HANFORD IP&D:

- The letter report, *Potential Benchmarks for Actinide Production in Hanford Reactors*, was provided to LLNL for posting on the NCSP website in November.

- The letter report, *Actinide Cross-Section Extraction Status Report*, was provided to LLNL for posting on the NCSP website in November.

- The reports, *Development of LA-10860 Database for CritView, MCNP5 Calculations Replicating ARH-600 Nitrate Data*, and the report documenting the updated CritView data, CritView Database - Version 1.05, were provided to LLNL for posting on the NCSP website.

- The capabilities of the CritView software and updated data files were presented at the ANS Fall meeting.

- Letter report, *Computer Models for Cross Section Extraction and Sensitivity*, completed and transmitted to LLNL.

- Letter report, *Actinide Cross-Section Extraction Status Report,* transmitted to LLNL

- Existing version of CritView (v1.02) was tested and confirmed to function with the Windows 7 operating system. No updates to the code or documentation are required.

- All planned calculations for expanding the CritView database were completed. These new data sets primarily dealt with low enriched uranium.

LLNL IP&D

- Participated in the annual ICSBEP independent and TRG meeting, at OCED Headquarters, Paris, France.

- Liaised with CS, CSEWG and NCT stakeholders to identify user needs for ICSBEP evaluations. Identified evaluations to be completed prior to the ICSBEP meeting in May. Identified and liaised with evaluators and reviewers regarding schedule and budget under NCSP auspices.

- Deployed ICSBEP web content on the NCSP website including a new user-friendly download and DVD burn feature. Added 598 pdf "Link Annotation" objects to enhance the appearance of the NCSP web-based on-line ICSBEP handbook

- Created and deployed a new on-line signature process for the IER form with additional 270 data fields. Added eight new user accounts enabling access to the on-line IER form.

- Created and deployed the Nuclear Data Request form on the NCSP website.

- Created and deployed new NCSP web content including on-line registration for the T&EP hands-on training course at LANL, NCERC and SNL.

- Installed classified fiber optic wire and activated a classified network connection at LLNL for the classified NCSP website.

- Updated NCSP webserver software to Apache version 2.2.21 to fix vulnerability that may cause denial of service.

- Liaised with evaluators, reviewers and international partners to prepare 7 NCSP evaluations for ICSBEP publication:

  HMF086 (Godiva-IV; LANL; supporting IER-147/148)
  HMF092 (HEU/Mo; VNIITF; IER-129)
  LCT080 (7UpCX; SNL; IER-135)
  MCF005 (ZPR-9/31; ANL; CSEWG benchmark)
  MCF006 (ZPPR-2; ANL; CSEWG benchmark)
  HCF002, HCF004 (student evaluations)
  These are available (with all other 2012 ICSBEP evaluations) at:
  http://ncsp.llnl.gov/ICSBEP/handbook/2012_eval/new_eval.html

- Received Sigma 20 certification/approval at the NNSS for JNPO "Red" network. Completed and published the new JNPO COMSEC SOP. Completed NTS-SLAN annual plan testing and review.

- Provided ORNL-generated input, output and S/U files for HMF086, HMF092, LCT080, MCF005 and MCF006 evaluations to OECD for inclusion in the DICE database.

- Attended the OECD WPNCS meeting in Paris on September 21, which formally established the ICSBEP as an Expert Group with a charter and 2-year mandate.

- Liaised with NCSP evaluators and reviewers and NCSP international partners in support of seven new evaluations for presentation at the annual ICSBEP TRG meeting, at OECD Headquarters, Paris, France. These evaluations are 7UpCX (IER-135), HEU/Mo (IER-129), Godiva-IV (IER-147, 176, etc.), two CSEWG benchmarks (ZPR-9/31, ZPPR-2) and two student evaluations.

- Revamped ICSBEP web pages and added 3600 pdf "Link Annotation" objects to enhance the appearance and user-friendliness of the NCSP web-based on-line ICSBEP handbook.

- Created and distributed 20 ICSBEP DVDs to NCSP criticality safety end-users.

- Presented ICSBEP accomplishments at the NCSP Technical Seminar at ORNL on March 13-14, 2012. This presentation also informed NCSP End-users of use of the IER/CEdT process for "legacy" evaluations.

- Attended and presented NCSP website statics and accomplishments at the annual NCSP Technical Seminar in ORNL March 13-14, 2012.

- Added additional ten new IER users to the IER processes.

- Transferred unclassified NCSP beta website into LLNL classified iSRD network in preparation to deploy a classified NCSP beta website on ESN network.

- Completed the annual security controls review and certification testing of the NTS-SLAN at NCERC. This allows us to continue classified network operations at NCERC for another year.

- Completed NCSP independent and TRG reviews of the MIRTE-1 benchmarks at a meeting at IRSN Headquarters on May 14, 2012.

- Liaised with Jim Gulliford (OECD) at the ANS meeting in Chicago and discussed NCSP additions to the ICSBEP handbook including direct links from the evaluations to the TSUNAMI S/U files and new VALID SCALE input listings. OECD agreed to add this to the agenda of the WPNCS meeting scheduled for September 17-21, 2012.

- Developed and deployed a new utility that exports IER forms to pdf files.

- Procured hardware and software for Classified NCSP website.

- Created and submitted the Classified NCSP website security plan to LLNL CSO.

- Modified and updated all 43 NCERC (formerly CEF) summary activities files.

- Submitted SCR (System Change Request) for NTS-SLAN (NCERC) to update software.

- Responded to two data calls from LANL on NTS-SLAN compliance.

- Re-keyed TACLANEs for LANL red networks**.**

- Received SCR approval from LANL for NTS-SLAN upgrades.

- Completed a new MOU/ISA for NTS-SLAN to ensure classified communications between three classified networks at Los Alamos.

- Created and deployed a new NCERC CEdT status web section with sorting capabilities on IER no., Priority-Year, Requestor Name, CED status, and Execution. Added sorting capabilities to "NCSP Manager Approval (DOE HQ Only)" CEdT Process status web page.

- Received approval from LSO/LLNL CSO to operate the classified NCSP website on Enterprise Secured Network (ESN). Completed testing of the ESN connectivity from LLNL to

the classified NCSP website. Transferred a copy of the unclassified NCSP IER database and contents to the classified NCSP website.

- Completed upgrades of the server and workstation software for the NTS-SLAN (NCERC) "Red Network" including upgrading to Windows 7.

ORNL IP&D:

- Completed inventory record (database) of Dixon Callihan's personal NCS library (~ 900 reports.

- Updated the SCALE quality assurance procedure for VALID (Verified, Archived Library of Inputs and Data) for consistency with the new SCALE QA plan and to streamline the VALID process for the generation of data for ICSBEP evaluations.

- Following the VALID QA process, sensitivity profiles and SCALE input files were generated and submitted to the US NCSP ICSBEP for the following new evaluations: LEU-COMP-THERM-080, MIX-COMP-FAST-005, MIX-COMP-FAST-006, HEU-MET-FAST-086, and HEU-MET-FAST-092.

- Eight boxes (~160 files) of general information from the Oak Ridge Critical Experiments Program (1946–1975) were surveyed as to categories (Design Specifications, Blue Prints, Administrative Documents, etc.) suitable for inventorying into Excel files—hard copies of the information were moved into secured storage for preservation.

- Demonstrated SCALE tool to compute experimental uncertainties and correlations based on uncertainties in experimental parameters provided in ICSBEP to the OECD/NEA WPNCS expert group on Uncertainty Analysis for Criticality Safety Assessment benchmark.
- Initiated work to generate sensitivity profiles and quality assured SCALE input files.
- Transitioned ORNL task lead for IP&D task to preserve NCS document collections from retiring ORNL NCS staff member to senior ORNL NCS staff member.
- Collected hard-copy IP&D records from Y-12 9213 and relocated records to ORNL.
- Generated sensitivity profiles for the following new ICSBEP evaluations: LEU-COMP-THERM-080, MIX-COMP-FAST-005, and MIX-COMP-FAST-006.
- Surveyed 46 files of general information on the Oak Ridge Critical Experiments Program (1946–1975) and organized files into categories (Design Specifications, Blue Prints, Administrative Documents, etc.) suitable for inventorying into Excel files—information would provide future resource information for relational database access to support current and future NCSP integral experiment efforts.
- Developed prototypic SCALE tool to compute experimental uncertainties and correlations based on uncertainties in experimental parameters provided in ICSBEP.

Nuclear Data

ANL ND:

- Contributed to the LANL March 8-9 Fission Workshop including presentation "Experimental Nuclear Data Covariances" by D. L. Smith.
- Contributed to NCSP Technical Seminar March 13-14 at ORNL, including presentations on:
    "How to Design a Critical Experiment aka CED-1 and CED-2,"
    "Integral Experiment Covariance Data," and "ANL Nuclear Data Activities".
- Contributed to NCSP CSSG meeting March 15-16 at ORNL.
- Continued collaboration with IAEA on development of covariance methodologies including use of the Unified Monte Carlo Method and the Total Monte Carlo Method.
- Co-authored (D.L. Smith) paper "Experimental Uncertainty and Covariance Information in EXFOR Library" presented at the Covariance Workshop held at the Technical University of Vienna.
- Continued ENDF/B-VII.0 and -VII.1 data validation and authored (Lell and McKnight) paper "Data Validation using Detailed Models of ZPR and BFS Assemblies" presented at the BFS-50 Conference, February 28 - March 2.
- Completed compilation of uncertainty components for the ICSBEP evaluated ZPR/ZPPR experiments and analyzed experimental correlations.
- Participated in Nov. 2011 CSEWG meeting, including organizing and chairing the Covariance Committee (D.L. Smith), participating in the Executive Committee and presenting data validation results testing performance of the new NCSP evaluations for ENDF/B-VII.1.
- Co-authored "ENDF/B-VII.1 Nuclear Data for Science and Technology: Cross Sections, Covariances, Fission Product Yields and Decay Data" paper published in Nuclear Data Sheets, Vol. 112/12 (2011) 2887-2996.
- Contributed validation results for ENDF/B-VII.1 and co-authored "ENDF/B-VII.1 Neutron Cross Section Data Testing with Critical Assembly Benchmarks" paper published in Nuclear Data Sheets, Vol. 112/12 (2011) 2997-3036.
- Authored (D.L. Smith) paper "Evaluated Nuclear Data Covariances: The Journey from ENDF/B-VII.0 to ENDF/B-VII.1" published in Nuclear Data Sheets, Vol. 112/12 (2011) 3037-3053.
- Co-authored (D.W. Muir) "Covariances of Evaluated Nuclear Cross Section Data for ^{232}Th, ^{180,182,183,184,186}W and ^{55}Mn" paper published in Nuclear Data Sheets, Vol. 112/12 (2011) 3098-3119.
- Contributed to the QA Review of ENDF/B-VII.1 covariance data.
- Organized and chaired November NDAG meeting at BNL.
- Provided input and feedback on formation of NCSP Nuclear Data Request website.
- Continued collaboration with IAEA on development of covariance methodologies including use of the Unified Monte Carlo Method and the Total Monte Carlo Method.
- Co-authored (D.L. Smith) paper "Experimental Uncertainty and Covariance Information in EXFOR Library" presented at the Covariance Workshop held at the Technical University of Vienna.
- ENDF representative to the 2012 OECD /NEA Working Party on International Evaluation Cooperation (WPEC); monitor and participant in WPEC Subgroup 33 on "Methods and Issues for the Combined Use of Integral Experiments and Covariance Data".

- Co-organized and co-chaired ANS special session on "Validation of ENDF/B-VII.1."
- Participated in panel and delivered presentation on "Quality Benchmarks" at the 2012 ANS Annual meeting.
- Submitted paper "How to Design a Critical Experiment aka CED-1 and CED-2," for the NCSP session at the 2012 ANS Winter meeting.
- Co-authored (D.L. Smith) paper "Experimental Uncertainty and Covariance Information in EXFOR Library" presented at the Covariance Workshop held at the Technical University of Vienna.
- Provided extensive comments (Lell and McKnight) on the MIRTE report and participated in the confidential MIRTE review meeting.
- Provided support to NCSP Managers regarding C_EdT and nuclear data input (GANTT Charts); provided review comments on the MIDAS Feasibility Study; and submitted "Create ICSBEP Document for Pu/C core ZPR-3 Assembly 58" in support of data validation of ^{239}Pu data in the intermediate energy range.
- Completed set of integral experiment covariance data for 33 ANL ZPR/ZPPR submitted to DICE.

BNL ND:
- Posted ACE-formatted versions of ENDF/B-VII.1 data library on NNDC website.
- The final ENDF/B-VII.1 library was released on December 22, 2011. It contains a set of 190 covariances in the final release and many corrections over both ENDF/B-VII.0 and the many beta releases.
- All NCSP supported evaluations submitted to NNDC were verified for format correctness and ability to be processed and were included in the final release.
- Covariances in the final ENDF/B-VII.1 release were reviewed and compared with integral quantities, using the Sigma QA system.
- New evaluations are being stored in the GForge server as they are submitted to the NNDC, and we are performing QA on them as they arrive using the ADVANCE Continuous Integration System. Results of tests available at http://www.nndc.bnl.gov/endf/b7.dev/qa/.

LANL ND:
- Three peer-reviewed papers published in December issue of Nuclear Data Sheets (topics: Evaluations for ENDF/B-VII.1, Validation of ENDF/B-VII.1, and Covariances).
- Contributed several talks and chaired Evaluation and Validation Committee sessions at the annual CSEWG meeting.
- Developed proposed methodology for using existing ENDF-6 formats to represent p(nu) data (XCP-5:MCW-12-014).
- Analysis of previous RPI pseudo-differential Be-9 angular distribution experiments using most recent version of LANL Be-9 evaluation.
- The prompt fission neutron spectrum (PFNS) covariance matrices evaluated earlier have been propagated successfully through MCNP calculations of selected critical assemblies using the polynomial chaos expansion (PCA) method. This method and numerical results are discussed in a publication submitted to Nuclear Science & Engineering: "Prompt Fission Neutron

Spectrum Uncertainty Propagation using Polynomial Chaos Expansion," M.E. Rising, A.K. Prinja and P. Talou, LA-UR-12-25240.

- An abstract on the n+12C analysis, entitled, "n+12C Cross Sections from an R-matrix Analysis of Reactions in the 13C System," by G.M. Hale and P.G. Young, was submitted to the ND2013 conference, and it was accepted for oral presentation.
- An R-matrix analysis of reactions in the 14C system was begun as a single-channel analysis of n+13C scattering at energies below 4 MeV.
- The analysis of the n+9Be reactions with data included for the elastic scattering angular distributions is completed.
- Performed new evaluations for the prompt fission neutron spectrum (PFNS) for suites of uranium and plutonium isotopes using a modern and improved version of the Los Alamos model. In total, 18 isotopes have been evaluated consistently and cross-isotope model correlations were evaluated for the first time. Those evaluations also come with full covariance matrices at given incident neutron energies.
- PFNS for Minor Actinides: Evaluated the prompt fission neutron spectra (PFNS) for two suites of U (230-241) and Pu (236-246) isotopes from thermal to 5 MeV incident energies. A modified version of the Madland-Nix model was used, incorporating an anisotropy factor for the emission of the prompt neutrons in the center-of-mass of the fission fragments. The model input parameters were derived consistently across each suite of isotopes. Experimental data available for a few of those isotopes were incorporated in the evaluation through a Kalman filter, leading to constraints on the entire suite. Also, for the first time, cross-isotope correlations were evaluated. The final results have been produced in ENDF format, for both spectra and covariance matrices. The final ENDF results were merged into the ENDF/B-VII.1 library files, and have been processed through NJOY successfully. This work has been documented in a publication submitted to Nuclear Science and Engineering, currently under review. Also note that results from this evaluation, both PFNS and covariances, are already being used in transport simulations [M. White, P. Talou, M. Rising, LA-UR-12-23136, abstract to NECDC2012].
- Covariances were produced for the n+12C evaluation. Additional n+13C data were collected for an evaluation of this isotope. We continued analysis of the 10B system with n+9Be angular distribution data. We revisited the 17O R-matrix analysis with new Geel data for n+alpha on 16O, to see if normalization discrepancy can be resolved.
- Participated as an ENDF representative in the OECD/NEA Working Party on International Nuclear Data Evaluation Cooperation (WPEC) annual meeting and various subgroup activities.
- Co-organized (with ANL, BNL, and ORNL) a session at the Chicago ANS meeting on "Initial Experience with ENDF/B-VII.1."
- NCSP Technical Seminar: Kahler, "LANL Data Testing Support for ENDF/B-VII.1 and Data Evaluation Support for ENDF/B-VII.1" (selected as a "best paper").
- Continued analysis of previous RPI pseudo-differential Be-9 angular distribution experiments using most recent version of LANL Be-9 evaluation.

LLNL ND:
- "High fidelity" model calculations were completed for delayed fission gamma emission from all (52) thermal, fast and 14 MeV neutron-induced fission targets in the England and Rider database using the NuDat 2 database of FP half-lives, daughter branching ratios, and discrete and/or continuous gamma energy spectra.
- Studies comparing the results of "high fidelity" model calculations using the JENDL, JEFF and NUDAT2 fission product decay databases continue.
- Processing the ENDF/B-VII.1 fission yield and decay data for all available nuclides (including new data for ^{239}Pu) in progress.
- Created FY.ENDFB7R1 and DC.ENDFB7R1 binary files containing ENDF/B-VII.1 fission yield and decay data, respectively, for all available nuclides (including the new ENDF/B-VII.1 data for ^{239}Pu).
- Created the DFGtoCOG code that reads the above files to create the DFG.ENDFB7R1 library file of delayed fission gamma multiplicities and spectra as a function of time from 0 to 10^{10} seconds and energy that is log-log interpolable for all available incident neutron energies.
- Created binary files containing all available fission yield and decay data from ENDF/B-VII.1, JEFF-3.2 and JENDL-4.0:

      FY.ENDFB7R1   FY.JEFF3.1.1   FY.JENDL4
      DC.ENDFB7R1   DC.JEFF3.1.1   DC.JENDL4

- Created coding in COG11.1 utilizing DFG.ENDFB7R1 data enabling calculation of delayed photon dose and dose rates with the ENDF/B-VII.1 stipulation of linear interpolation between incident neutron energies.
- Created the DFGtoCOG code that reads files to create COG binary libraries of delayed fission gamma multiplicities and spectra as a function of time from 0 to 10^{10} seconds and energy that is log-log interpolable for all available incident neutron energies:DFG.ENDFB7R1 DFG.JEFF3.1.1 DFG.JENDL4.
- Calculational results show excellent agreement with experimental multiplicity data and good agreement with low-resolution experimental energy spectra.
- Created coding in COG11.1 enabling "one-code, one-step" calculation of delayed photon dose and dose rates in standard criticality calculations (with detectors). Sample COG11.1 calculations using 1959 Henderson fluence-to-dose factors are consistent with ORNL multi-code, multi-step, results published in "An Updated Nuclear Criticality Slide Rule."

ORNL ND:
- Differential Data Measurements at IRMM—initiated additional capture measurements with thicker metallic Ca sample in effort to obtain more data on small Ca resonances.
- Finished data sorting and reduction at IRMM for 63Cu and 65Cu—provided preliminary cross-section data to evaluators.
- Initiated additional W transmission experiments to cover regions of missing data due to the black resonance filter effect in previous IRMM measurements.
- Initiated cerium sample preparation for FY12 measurements at IRMM.
- Obtained IRMM data analysis/reduction software (AGS) and installed on ORNL computers— tested AGS software by performing data reduction analyses and compared with previous results obtained at IRMM.

- MIT graduate student (under guidance of ORNL evaluator) updated 63,65Cu resonance parameters to improve statistical distribution from 100-300 keV.
- Produced updated resonance parameters for 182W, 183W, 184W, and 186W based on recently measured IRMM data.
- Produced updated set of 56Fe resonance parameters based on measured inelastic data from IRMM and total cross-section data from ORNL.
- Used SAMMY to prepare several new data fits for 239Pu in the low-energy region to better represent and-values indicated by critical benchmark calculations—in collaboration with LANL, performed MCNP benchmark calculations to assess impact of new 239Pu resonance parameters.
- Performed re-evaluation of 235U resonance parameters from 500 eV to 2,250eV using capture normalization indicated by new RPI capture measurements—Improved results have been obtained with new 235U evaluation based on multiple MCNP calculations for thermal, intermediate, and fast benchmarks.
- Participated in monthly conference calls with NR/KAPL and RPI to coordinate resonance-region measurement capability development at RPI.
- Initiated task to obtain ORELA BaF detectors to send to RPI to support the Differential Data Measurements at IRMM.
- Obtained natural Ce and enriched 142Ce samples and initiated measurements at IRMM.
- Performed data reduction for the 10B-filtered run for 63Cu and 65Cu—will allow analysis of resonances above 102 keV—currently analyzing background problems in the Cu data obtained with the 10B and sulfur filter configuration.
- Initiated additional tungsten transmission experiments to cover regions of missing data due to "black" resonance filter effect in previous IRMM data.
- Presented ORNL nuclear data measurements work at March 2012 NCSP Technical Symposium.
- ORNL nuclear data evaluator traveled to MIT to work with graduate student who is performing 63Cu and 65Cu resonance evaluations—updated evaluations produced for 63Cu and 65Cu and paper prepared for PHYSOR 2012 Meeting.
- Received 56Fe transmission data from RPI and initiated work to include RPI data in new 56Fe resonance evaluation.
- Initiated 2-month visit at CEA to finalize the 239Pu evaluation—collaborative effort includes benchmark testing with proprietary CEA critical experiments.
- Testing with preliminary 239Pu evaluation has demonstrated improved performance for ICSBEP thermal solution critical experiments.
- Produced preliminary 235U resonance evaluation from 10-5 eV to 2.25 keV and performed additional benchmark testing of updated evaluation in the low and intermediated energy regions—also initiated collaboration with JAEA to perform benchmark calculations with the preliminary 235U evaluation.
- Presented tungsten, copper, and 239Pu evaluation efforts at March 2012 NCSP Technical Symposium.
- Participated in monthly conference calls with NR/KAPL and RPI to coordinate resonance-region measurement capability development at RPI.
- Completed transmission measurements for calcium.

- Performed new 183W transmission experiments with different filter configuration in order to correct problems in keV region that were observed with previous IRMM measurements.
- Performed data sorting and analyses of the calcium capture experiments for various filter configurations.
- Performed background analyses to understand differences for 63Cu and 65Cu capture measurements with and without sulfur filters in the beam—investigating possible solution of using different normalization for the individual runs.
- Participated in meeting at RPI in Q3 to assess new capture measurement flight station and make recommendations for new experimental set up.
- Completed 2-month visit at CEA/Cadarache to improve the 239Pu resonance evaluation—collaborative effort included benchmark testing with proprietary CEA critical experiments that have resulted in improved 239Pu evaluation.
- Prepared abstract with LANL and CEA for WONDER 2012 meeting to document performance of new 239Pu evaluation.
- Updated 235U capture evaluation based on testing with evaluation from Q2 and initiated work with CEA to further test new 235U evaluation.
- Participated in the annual WPEC meeting and associated subgroup meetings—presented latest 239Pu evaluation results to WPEC Subgroup 34 that is working to improve 239Pu evaluation.
- Produced updated resonance parameter evaluations for 182W, 183W, 184W, and 186W using latest experimental data—updated transmission data needed in 2-10 keV energy region for 183W and 186W.
- Updated 63Cu and 65Cu resonance evaluations to include new capture data up to 100 keV.
- Obtained new RPI 56Fe transmission data and initiated SAMMY analysis.
- Completed ^{239}Pu resonance evaluation and delivered to NNDC.
- Participated in the international WONDER2012 meeting and presented ^{239}Pu evaluation results—also discussed plans for updating the ^{235}U resonance evaluation to improve the capture data.
- Obtained new ^{235}U fission/capture data from RPI—traveled to RPI to discuss the measurement details and initiated SAMMY analysis of the ^{235}U data.
- Worked with MIT Ph.D. student to update the ^{63}Cu and ^{65}Cu resonance evaluations to extend the resolved resonance region up to 130 keV.
- Updated the ^{56}Fe resonance analysis to include new data from RPI and IRMM—presented status of the ^{56}Fe evaluation at the WINS meeting in Boston, MA.
- Completed Nuclear Data Sheets journal article for ORNL NCSP nuclear data evaluations that will be published in special issue on ENDF/B-VII.1—international peer review completed and journal article accepted for publication.
- Differential Data Measurements at IRMM
    - Initiated 5-week visit at IRMM to perform neutron cross-section measurements for natural cerium (Ce)—initiated capture measurements for thin Ce sample and obtained data for sample and empty aluminum canister for the boron, sulfur, and sodium filter configuration.
    - Performed ^{183}W transmission data sorting with different filter configuration and initiated ^{183}W transmission data reduction.
    - Performed data reduction for natural iron sample to obtain normalization for the measured calcium capture data.

    o Completed data reduction for thin calcium sample capture measurements using ^{10}B filter configuration.

RPI ND:

- Completed high resolution (250m flight path) transmission measurements of several sample thicknesses of Fe-56 in the energy range 0.5-20 MeV, a report and the data are in preparation to provide to ORNL to include in the valuation.
- Complete U-238 scattering for two sample thicknesses data analysis.
- Construction of the 40m flight path station stated, completion expected in February 2012.
- New digitizer and prototype detector received at RPI.
- ^{56}Fe transmission data and report were delivered to ORNL.
- U-238 scattering data analysis is in final stages, a paper was submitted to the 2012 ANS annual meeting in San Diego.
- Construction of the 40m flight path station was completed.
- Cu samples (for scattering measurement) are on order.
- U-238 scattering data analysis done, a paper was submitted to the 2012 ANS annual meeting in San Diego and a Journal paper is under internal review.
- Fe-56 scattering measurement: Samples holder was fabricated and measurements are planned for August 2012.
- Danon participated in WPEC meeting to present report on USA nuclear data activity which includes the NCSP activity.
- Fe-56 scattering measurement completed, data analysis is in progress.
- New Capture capability: Prototype detector test in during a capture run on CuMn sample.
- Digital DAQ is under development (was successfully test during a test run).
- Detector mount was designed and materials purchased.
- Flight tubes design completed.
- A talk about the RPI scattering capabilities including results on U-238 was presented in the 2012 International Workshop on Inelastic and Elastic Neutron Scattering (WINS 2012).
- Publication on U-238 scattering is under internal review at RPI.
- New Capture capability:
  - First/preliminary capture experiment for a CuMn sample was completed.
  - Digital DAQ is under development, was used during the preliminary experiment.

Training and Education (T&E)

ANL T&E:

- Created outline and proposed format for the multi-media conversion of the NCSET hand calculations module.

LANL T&E:

- Revised presentations and Class notes for training provided at LANL and NCERC.

- Participated in Meetings and Conference Calls to support execution of training classes.

- Executed two-week Criticality Safety Engineer training course at LANL and NCERC.

- Rotated different staff into the training rotation to expand available pool of instructors for future training course.

LLNL T&E:

- Attended the T&EP course materials review meeting in Albuquerque, NM.

- Updated the NCSP website to include the latest information regarding the two-week T&EP hands-on training course, including course flyer, class registration, syllabus, course dates, prerequisites, and travel information.

- Completed and deployed on-line course registration web application and processed student registration for upcoming classes.

- T&EP hands-on training course schedule deployed on website.

- TACS move to the LLNL Nuclear Material Operation (NMO) building completed.

- Attended the T&EP course materials review meeting at Oak Ridge National Laboratory.

- Updated T&EP NCRC training modules 1, 2, 3, 4, 10 and 11 based on feed-back from the 2nd pilot course.

- Provided "hands-on" training for the first 2012 course at NCERC.

- Reviewed 2nd pilot course training conducted at LANL, SNL and LANL portions of the NCERC course.

- Provided registration and logistical support for the second 2012 course at LANL and SNL completed May 25, 2012.

- Qualified an additional "hands-on" TACS instructor for work at NCERC.

- Provided LLNL Nuclear Materials Operations (NMO) input to the DAF Conduct of Operations Matrix for TACS (approved by NSO).

- Completed annual reviews and renewed the LLNL NMO Secondary REOP and "Cross-walk to Verify NMO Implementation of DAF TSR SMP Key Elements."

- Completed a Memorandum of Understanding between three LLNL training organizations to enable hiring of a temporary student intern in instructional design and online training development. The preferred candidate accepted this position and started work full-time on this 12-week appointment on June 18, 2012.

- In conjunction with LANL, completed a major revision to the LANL/LLNL hands-on training course materials based on feedback from the first pilot course.

- Provided four LLNL subject matter experts to support the NNSA "Independent Investigation of Planet and Flat-Top Control System Uncommanded Movement Anomalies."

- Provided registration and logistical support for the 4th course at LANL, SNL, and NCERC completed on August 31, 2012.

- Provided hands-on instruction at NCERC with the TACS for the 4th course completed on August 31, 2012.

- Completed multimedia conversion of NCSET Module 8 – Part I, Buckling Conversion and Surface Density Methods, which are available for review at: http://ncsp.llnl.gov/ncset/Criticality_Buckling_Method/player.html and http://ncsp.llnl.gov/ncset/Criticality_Surface_Density/player.html

ORNL T&E:

- Organized and conducted T&E meeting at SNL to review and update training materials for first course in FY12.

- Updated NDA course training materials per comments from FY11 pilot course and peer review.

- Revised dates for annual NCSP Technical Symposium to be March Organized and conducted T&E Pilot/Course in January/February 2012.

- Participated in LANL classroom and NCERC hands-on courses— assessed quality of presentation materials and comprehension by students through review of classroom and NCERC courses and test results.

- Collected comments from course reviewers and communicated comments to respective course instructors.

- Organized and led weekly T&E conference calls as needed to coordinate planning for FY12 training courses.

- Organized T&E comment resolution/review meeting on March 16, 2012 following NCSP Technical Symposium at ORNL with objective to address and resolve latest round of comments from the January/February pilot course offering.

- Organized and hosted annual NCSP Technical Symposium March 13-14, 2012 at ORNL.

- Organized and conducted T&E Course in August 2012.

- Ensured final course materials were uploaded to the SharePoint site for use in all training courses—printed, assembled, and shipped handout materials to LANL and NCERC for respective courses.

- Participated in LANL classroom and NCERC hands-on courses—assessed quality of presentation materials and comprehension by students through review of classroom and NCERC courses and test results.

- Collected comments from course attendees and communicated comments to respective course instructors.

- Participated in LANL classroom and SNL hands-on courses— assessed quality of presentation materials and comprehension by students through review of classroom and SNL courses and test results.

- Collected comments from course attendees and communicated comments to respective course instructors.

- Organized and led weekly T&E conference calls to coordinate planning for FY12 and FY13 training courses.

- Published and presented paper on T&E Course at the 2012 EFCOG Safety Analysis Workshop.

- Prepared summary of the T&E Course and submitted to the special NCSP session at the 2012 ANS Winter Meeting.

SNL T&E:

- The presentation materials for the first FY12 offering of the training class were modified per the input from the T&EP HF&ER.

- Trainer support was provided to the third session of the LANL Hands-On Criticality Safety Training Class in August.

- The third training class this FY was delivered in late August HF&ER support was provided for one session of the LANL Hands-On Criticality Safety Training Class in January.

Criticality Safety Support Group (CSSG)

- Completed Revision to 2010-1 "seismic paper."
- Completed CSSG Tasking 2011-5 "Godiva safety."
- Support of CSSG, CSCT and DOE calls on "seismic paper."
- Completed CSSG 2011-6 "PF-4 LASO/LANL Review."
- Continued review of DOE-STD-3009.
- Reviewed NCSP Proposals (new tasks and continuations).
- CSSG Policy Revisions.
- Supported June CSSG Meeting.
- Nominated/Elected new member.
- Support preparations for San Diego joint CSSG/CSCT meeting.
- CSSG member performance review with NCSP.
- CSCT liaison teleconference.
- Support review/revision of DOE-STD-1020.
- Attended NCSP Task Managers Meeting.

- Reviewed NCSP 5-year Plan.
- Supported the "NCSP Mission and Vision" meeting in Oak Ridge.
- Review of DOE-STD-1134 in light of DOE-STD-3007, 2007.
- Supported transition of Chair/Deputy Chair positions.