

An Overview of IRPhEP and ICSBEP for Integral Benchmark Evaluations

*Nuclear Energy University Programs (NEUP)
Consolidated Innovative Nuclear Research (CINR)
Fiscal Year 2017 Annual Planning Webinar*

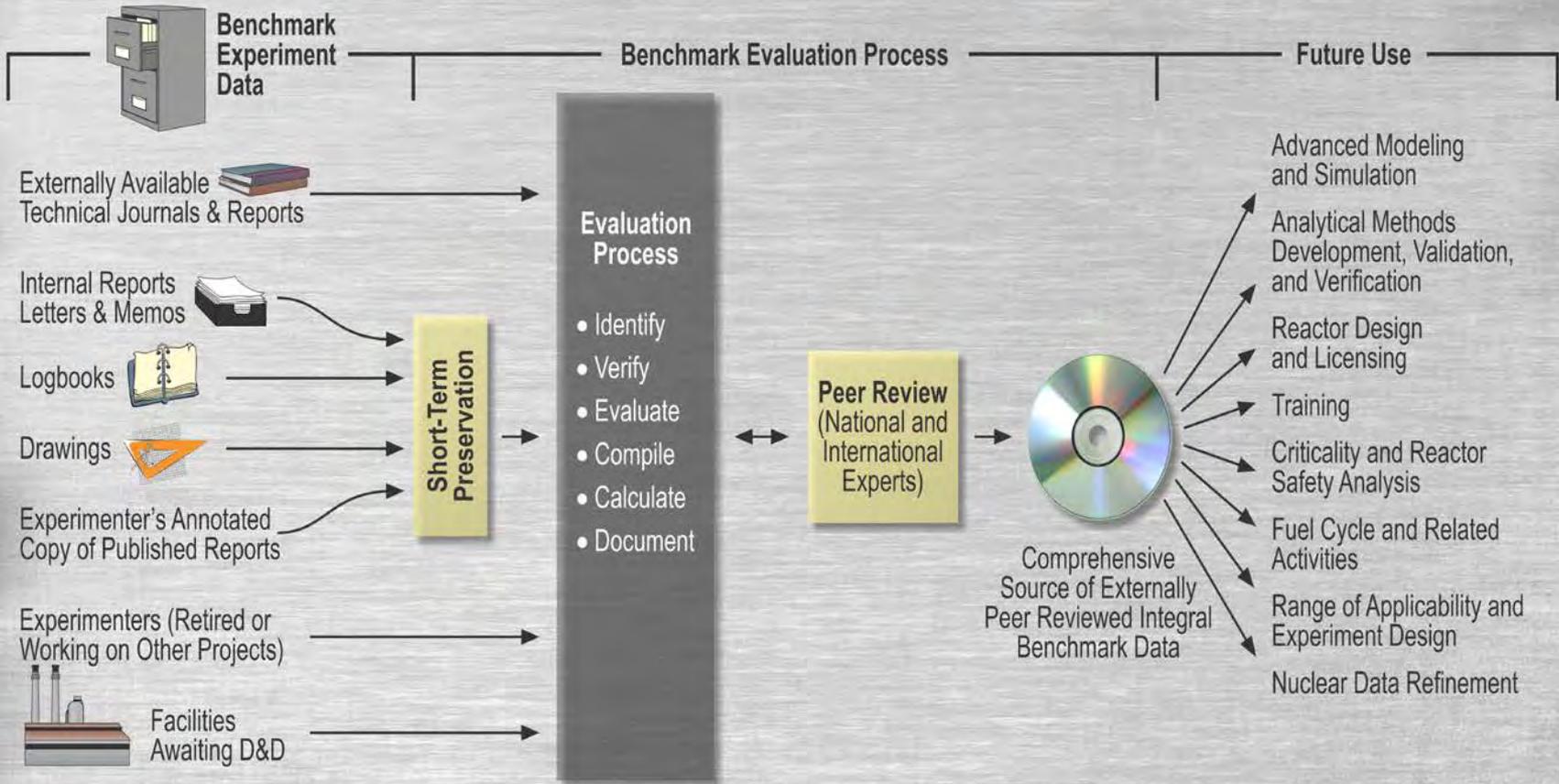
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ICSBEP: *International Criticality Safety Benchmark Evaluation Project*

IRPhEP: *International Reactor Physics Evaluation Project*

- These are OECD NEA international activities involving expert groups focused on updating and publishing Handbooks that support:
 - characterization of reactor core and methods
 - neutronics components of multiphysics measurements
 - validation of nuclear data; including cross sections; and
 - reactor and criticality safety, including modeling, simulation, and training
- These benchmark development efforts:
 - Compile benchmark-experiment data into standardized format
 - *Can be readily used to validate computational techniques and cross section data*
 - Evaluate the data
 - *Quantify overall uncertainties through various types of sensitivity analyses*
 - Eliminate the a large part of the tedious and redundant research and processing of experiment data that other researchers/analysts/designers would have to perform
 - Streamline necessary step of validating computer codes and nuclear data with experimental data
 - Preserve valuable experimental data
 - *Experiments represent significant investment of time, infrastructure, expertise, and cost that might not have received adequate documentation*
 - *The opportunity to repeat most of these measurements has long since passed*

INTERNATIONAL BENCHMARK PROGRAMS



MS-NE-1 – NEUP/CINR

Work-scope Description

- MS-NE-1 – Integral Benchmark Evaluations for inclusion in the International Reactor Physics Experiment Evaluation Project (IRPhEP) and International Criticality Safety Benchmark Evaluation Project (ICSBEP) Handbooks (TPOC – John Bess, john.bess@inl.gov)
 - Benchmark evaluation proposals are sought which would use existing experimental data, and would support NE programs (*e.g.*, TREAT, LWRS, FCT, ART, and NE’s Advanced Modeling and Simulation Program)
 - Measurements of interest include critical, subcritical, buckling, spectral characteristics, reactivity effects, reactivity coefficients, kinetics, reaction-rate and power distributions, and other miscellaneous types of neutron and gamma transport measurements
 - A growing area of interest includes evaluation of transient benchmark experiment data for light water reactor systems, such as PWRs and BWRs
 - To avoid duplication, please take into account ongoing work in these recent projects:
 - *An Integrated Research Project awarded under IRP-NE-1 in FY15 to prepare one or more TREAT transient testing benchmarks, and*
 - *Integral Benchmark Evaluation Projects awarded under MS-NE-1 in FY16 for a Molten Salt Reactor Experiment Benchmark Evaluation and in FY17 for Reactor Physics Benchmark Evaluations for Power Burst Facility Experiments*
 - All evaluations must be completed according to the IRPhEP and ICSBEP requirements, including peer review