



**The Center for Advanced  
Engineering & Research**

**Dear R&D Community,**

The recent U.S. Department of Energy (DOE) Nuclear Innovation Workshop highlighted several keystones for the advancement of nuclear technology. Among these were Designate Test Bed and Increase Private Investment. The Babcock & Wilcox Company's (B&W) mPower™ subsidiary and the Center for the Advancement of Engineering Research (CAER) are very much interested in supporting these objectives. Over the last six weeks, we jointly hosted several tours and workshops in Lynchburg, Virginia to introduce our proposal to multiple university participants.

The first of these workshops was held March 6, 2015, for university professors and associated staff. The discussion focused on the formation of a consortium that would become the next custodian of B&W mPower's Integrated Systems Test (IST) facility. Since early March, B&W mPower™ and the CAER have hosted three more meetings.

It is likely that you are familiar with the B&W mPower™ small modular reactor (SMR) program, which remains active with a staff of about 50 highly skilled professionals. To continue managing the development of the SMR technology difficult choices about future program investments have been necessary. One of those program investments has been that of the IST facility.

The IST represents a significant hardware investment by B&W and Virginia's Region 2000 Partnership. It is a heavily instrumented, scaled prototype of the B&W mPower™SMR, including balance-of-plant (minus turbines and power generation) and a state-of-the-art digital control system. To support its original mission as a design test bed for the B&W mPower™ SMR, the IST was designed to be flexible. This flexibility extends beyond the study of system-scale single- and two-phase thermal-hydraulics. A removable five-foot section above the core provides "plug-and-play" access for novel instrumentation concepts for the compilation of process-scale data covering the operational domain of various light water reactor designs. Supplied with 1.8 MW of power, the IST is capable of generating high temperature fluid and steam conditions for process heat applications and structural materials testing. Lastly, I&C systems incorporated at the IST and CAER lab have been outfitted to support communications, cyber security studies, and the development of emergency response procedures and operator training.

Our goal is to move beyond the original B&W mPower™ mission and become a national research resource. The discussions with regional universities has emphasized the establishment of a consortium to which B&W would allow the IST to be made available to the broader community of academics and laboratory research engineers and scientists. We are in the early stages of this transition and are working to promote this concept.

We next plan to present our plan to the DOE, the U.S. Nuclear Regulatory Commission and National Laboratory management and staff. Since we are unable to take the IST "on the road,"

we are asking people to take time out of their schedules to visit our facility in Lynchburg, to provide flexibility in scheduling, B&W mPower™ and CAER have planned for workshop meetings on both **June 4 and June 5**. If you are planning to attend the ANS conference the following week, please see the information below for travelling from central Virginia locations. We are currently reviewing remote participation capabilities; we will provide additional information as it becomes available.

The workshop will address the R&D challenges and opportunities for utilizing the IST and I&C Lab at CAER as a platform incorporating interfaces for process-scale thermal-hydraulic investigations and cyber-physical systems. The results of this workshop will be added to the Idaho National Laboratory Innovation Workshop website and as responses to the DOE RFI for Competitive Work Scope Development DE-SOL-0008246 and Potential Infrastructure Investments DE-SOL-0008318.

Our workshop will be coordinated by the CAER. We look forward to hearing from you and having you participate as we continue to work towards making the facility available for future testing and applications.

Sincerely,



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