Foreword

As this is being written, we have just begun a three-month shutdown during which we will, among other changes, install a next-generation liquid hydrogen cold source, which will increase cold neutron intensities by almost a factor of two. This is an excellent example of the necessary operating philosophy for any facility – improvement and change are the only constants. During the past year, we have had many changes in reactor systems, in instrumentation, in staff, and in science, all of which are aimed at continuing the development of the NIST Center for Neutron Research as a first rate neutron facility.

A new cooling tower, which is specially designed to reduce the visible vapor plume during winter months, as well as to provide full cooling ability for the next 20 years, has been constructed. It will be connected into the reactor secondary systems during the shutdown that has just started. A new analysis of major reactor systems has been initiated using the most modern tools as part of preparing the application for a license extension through 2024. Many other improvements, ranging from instrumentation renewal to better provision for maintenance to improved electrical distribution, are under way as part of the preparation for re-licensing. In spite of the shutdown that just started, the reactor has once again performed admirably, operating for 240 days during the fiscal year, meeting our scheduled operating time.

The three new inelastic scattering instruments, which were just coming on line last year, are now being fully incorporated into the user program, with encouraging user demand. The joint National Science Foundation (NSF)/NIST Center for High Resolution Neutron Scattering is being expanded to include operation of these instruments in addition to the prior SANS and triple axis instruments. The thermal neutron upgrade program, which includes two new triple axis spectrometers, an improved filter analyzer spectrometer, and other instruments, is advancing well, with characterization of monochromator crystals now complete, and contracts awarded for the manufacture of monochromator drums and focusing devices. A new cold neutron triple axis spectrometer is currently entering detailed design phase as a joint construction project with Johns Hopkins University (partially funded by the NSF). In order to create more research space in the guide hall, a new building for our technical support activities is nearing completion. In response to many recommendations, we have significantly strengthened our sample environment support and our data acquisition and analysis computing effort, adding additional staff and refocusing efforts. The number of research participants continues to grow, surpassing all of our expectations. Overall, we are moving forward on many fronts to strengthen our research facility operations efforts, in order to better serve our customers.

And, as always, the scientific results are the true measure of success, and the highlights that form the largest portion of this report comprise an excellent set of examples of the exciting outputs of the facility. I hope that you enjoy reading them as much as I did.

Mike Rowe