Final Report of the NIST Blue Ribbon Commission on Management and Safety II

November 2010

NIST Blue Ribbon Commission

on Management and Safety II

Final Report

November 18, 2010

Submitted to:

Director, National Institute of Standards and Technology

Submitted by:

The NIST Blue Ribbon Commission on Management and Safety II

Summary

We, the Blue Ribbon Commission II (BRCII), have had the opportunity to visit the laboratories of the National Institute of Standards and Technology (NIST) in Gaithersburg, MD, and Boulder, CO, in the month of October 2010. These visits are just two years after the Blue Ribbon Commission I (BRCI) issued a report highly critical of safety at the NIST laboratories. The progress in the last two years has been both impressive and dramatic. The new NIST Director has led what can be termed a transformational safety initiative.

NIST management has responded effectively to BRCI criticism. The entire NIST organization has been revamped with clearer roles and responsibilities. Resources for safety have been identified and applied. New talent has been attracted to a reorganized safety organization. Hazards analyses have been performed throughout the organization. Major progress has been made in developing a safety culture at NIST.

Despite the extraordinary progress, much remains to be accomplished in order for the new safety efforts to be institutionalized beyond the tenure of the current NIST Director. The first priority is the need to appoint an Associate Director for Laboratory Programs (and Principal Deputy) who will drive the present successes to the next level. The second priority will be to address the enthusiasm gap observed at the laboratory director level. In our interviews and focus group sessions with staff members from across the NIST organization, we were amazed at how well the NIST Director has driven the message all the way down to the bench-level scientists, even with a circumspect response of some of the laboratory directors.

"Keeping score" is an important part of a robust safety program. It is time for NIST to develop a suite of metrics. The commission strongly encourages NIST not to "reinvent the wheel" but to take advantage of the work of done by other laboratories and by industry.

Audit is an important part of a safety assurance program. Self-assessment is not an audit; rather, it is an important part of an audit. Because the Department of Commerce has no such function, another source will be needed. Some possibilities are a reciprocal relationship with the National Oceanic and Atmospheric Administration (NOAA) or the Department of Energy (DOE).

In summary, we recommend the following actions:

1. Appoint crucial Associate Director for Laboratory Programs (and Principal Deputy).

2. Address the enthusiasm gap in some senior management.

3. Establish an Audit mechanism.

In conclusion, the commission has thought about what would be a desirable end-state for safety at NIST. We would wish that the safety culture and program at NIST would be the standard by which all scientific laboratories would measure themselves. Within five years, senior science managers should be visiting NIST to learn about safety the way that scientists now visit NIST to learn about science and engineering.

Safety Culture Findings

The Deputy Director of two years ago now holds the position of Director. He has called upon virtually every mechanism at his disposal to actively develop and promote a comprehensive strategic plan for fostering a personal commitment to safety by every single staff member and at every level of management. He has used his strong communication skills and apparently widespread personal support throughout the Institute to infuse a broadly shared sense of commitment and unity of purpose. The beginnings of success were evident to the commission. The leadership vacuum at the top of the organization is now history. When compared to our findings of two years ago, the difference is dramatic.

Changing an organization's corporate culture takes a number of years and requires a management structure that firmly connects the various levels of authority so that leadership from the top of the organization can be effectively translated into actions and accountability through the entire chain of responsibility. Two years ago, the NIST organizational management and supervisory structure impeded rather than supported any changes in safety culture.

The Director has reorganized the various units to assist in promoting a safety imperative in all of NIST's activities. Leadership and operations have been strengthened; safety roles and responsibilities have been clarified. A totally new safety management program has been created that emphasizes reviews, rewrites all relevant documentation, and establishes new training programs that are meaningful to the various operating units. High-quality, experienced safety professionals have been hired at both sites. Their specialties have been chosen so as to be able to provide useful safety support and partnership to the broad range of NIST's activities. The morale within the new Office of Safety, Health, and Environment (OSHE) organization is high, including those members from the old Safety, Health, and Environment Department (SHED).

Training related to safety and hazards has become a much higher priority, with hundreds of staff members voluntarily signing up for training programs. New mechanisms such as web sites and call centers have been established to make it as

easy as possible for staff to access the resources and information they need to ensure safe operations. A new ticketing system tracks all requests for safety assistance. Staff can open and track their own tickets, thereby reinforcing their individual sense of safety ownership.

The Director has established an Executive Safety Committee to serve as a customer- and stakeholder-focused body for discussion, development, and review of NIST-wide policies and procedures and to provide mechanisms for employee input and participation. Staff-initiated safety committees that focus on particular areas continue to be encouraged. In one Operating Unit, a safety committee of experts from outside NIST has been asked to meet with staff to discuss safety culture issues and to provide feedback to the Lab Director. This director has found the results to be very useful and encouraging.

In summary, the development of a genuine safety culture at NIST is clearly under way. However, that Institute-wide goal has not yet been reached, and much steady effort over the months and years ahead will be required.

For example, the BRCII found that Laboratory Directors, in general, have not considered comparing their safety systems and performance metrics with those of similar units in other highly regarded organizations that are widely known to have well-established safety cultures. Also, the BRCII unanimously noted remnants of the old traditional view that placing safety thinking and actions on a par with highly focused scientific/technical activities diverts precious human and financial resources from NIST's central mission. Some of the most respected and highly valued members of the staff may hold this traditional view. Convincing them that safety and science/engineering can (and must) be fully integrated, without reservation, into each individual's philosophy of work at NIST remains one of the most important challenges for senior management.

Integration

In 2008, the commission found inconsistent and sometimes barely existing programs for identification of hazards and corresponding training programs. In our current examination at NIST, we find much work has been done to establish hazard identification protocols and to prioritize the risks presented by identified hazards. We also find the initial elements of a corresponding training program taking shape at the Institute. These are important and positive fundamental developments of an Institute-wide safety program. We also note the establishment of an Executive Safety Committee and a Safety Representatives Council to enable the transfer of best

practices among NIST organizational units. The NIST organizational unit lab directors need to support these cross-unit endeavors.

We also note greater acceptance of the NIST central safety, health, and environment personnel (OSHE personnel) by the research community, and we note greater and much more productive collaboration and integration between OSHE and lab personnel. These partnerships should be encouraged and developed.

The Center for Nanoscale Science and Technology (CNST) has an extensive set of rules and procedures for those who work in their facilities. These procedures cover "guest workers" and apply to everyone on the staff (including administrative personnel). NIST should adopt/adapt these types of policies and procedures for the entire organization. The precedent is there, and it can be applied more broadly throughout NIST. One practical problem is the lack of access to computer training systems for those who are not NIST employees. NIST should develop a separate network or web site that is accessible to guest workers; required training programs could be posted on this network.

An impressive amount of work has been completed in this area. And, importantly, a high amount of good will has also been created across the NIST community on the subject of safety management system development. Many of the primary elements of high-performance integration among NIST groups are now established, although some are still at an incipient stage. NIST as a community should seize this opportunity to grow these relationships, collaborations, and integrations as NIST develops common policies, procedures, inspection and audit protocols, training content, and data management during a maturing phase of safety program development.

Benchmarking and Metrics

The NIST Director, the laboratory-based Operating Unit (OU) Lab Directors, and the Chief Safety Officer have met with counterparts in organizations outside of NIST to **benchmark** their respective programs and exchange ideas and practices. Director Gallagher identified Oak Ridge National Laboratory (DOE) as one of the outside organizations he has consulted.

The Commission encourages NIST to identify additional organizations that can serve as benchmarks. Several major universities, for example, have extensive web sites containing descriptions of their policies and procedures. Stanford University is a good

example. Other national laboratories may also be candidates for discussion and benchmarking.

NIST's safety program will indicate **metrics** that would be appropriate to monitor safety requirements that are applicable throughout NIST. Once these requirements have been established, safety performance will be monitored, measured, assessed, and audited. Appropriate corrective actions will improve that performance. As key metrics, including injury/illness data for the entire facility, are recognized and understood by NIST staff, the safety culture will continue to deepen.

The individual Operating Units still maintain a fair amount of autonomy in developing their own safety policies and procedures. There has been no mention of metrics that would apply to the OUs. If nothing is measured, there can be no objective determination of how any individual program is succeeding.

OSHE is working to obtain data needed to manage NIST safety operations. For example, OSHE has initiated an OSHA-based workplace inspection program focused on laboratory/non-office spaces. This program will identify existing hazards and areas for improvement. We would like to see office spaces included in these inspection programs. The inspections should involve, at various times, lab managers, OSHE staff, facility/maintenance personnel, and bench-level scientists. Also, best-in-class safety programs eventually go beyond issues of compliance.

OSHE has implemented a new ticketing system to track all requests for safety assistance. These requests will identify safety needs and issues for all of NIST. OSHE has also developed a policy and web-based system for reporting "near misses." Attachment 10 in the Agenda Book for the Gaithersburg meeting describes the training program for the Initial Incident Report. Individuals who do not have a NIST Domain Account cannot submit a report, and this presents a gap which should be addressed.

Focus Group Discussion Sessions

In Gaithersburg, focus group discussions were held with four groups:

- the operating unit lab directors (LDs)

- division chiefs (DCs)

- members of the OSHE group and

- representative bench-level scientists and division safety representatives (BSs and DSRs).

In Boulder, focus group discussions were held with two groups:

- division chiefs (DCs) and

- representative bench-level scientists and division safety representatives (BSs and DSRs).

With one exception, all groups appeared to speak openly and without reservation, and all were eager to discuss the changes in safety management, which were generally viewed as positive and beneficial.

The DCs appeared to embrace and promote the policy changes of the new Director. They readily accepted their own responsibility and accountability for safety, and they proactively delegated responsibility, authority, and accountability for safety to their staffs. Though seemingly "on board" with the transition to a line safety management organization, some did not have a clear vision of an appropriate end point for this transition.

The DCs in Boulder seem to have accepted the new policy to imbed safety into operations. Without solicitation, they declared their ownership of safety. They also had a surprisingly good grasp of both the issues (e.g., getting lab scientists to accept ownership, seeking ways to reduce the paperwork burden without losing programmatic substance, easing the potential problem of crowded lab space, and properly instilling safety into short-term workers) and a desired end-state (e.g., "other organizations come to us" for safety advice/expertise).

The OSHE group showed a dramatic change, appearing now as a confident and appreciated group, with suitable competencies and appreciative of its increased visibility, management support, and funding. This contrasts dramatically with the discouraged and unwanted organization it seemed to be two years ago. OSHE staff members also value their clearly defined roles of developing safety policy programs and assisting the OUs in implementing them.

The Gaithersburg BSs and DSRs seemed to work well together (as before) and spoke supportively of the recent changes to safety management, though they tended to focus understandably on the types of hands-on activities they would be involved in. They also now seemed to value and willingly seek input and assistance from the OSHE group (unlike before).

The Boulder BSs and DSRs acknowledged the serious demands placed on their time over the last two years, but clearly recognized that NIST is changing its mode of operation and seemed aware of the benefits, problems, and realities of this transition. The BSs appreciated the work of the DSRs and sought more integration with the

Boulder Safety, Health, and Environment Division (BSHED), which is happening but remains a work in progress. The DSRs appreciated the improved resources, management support, and cooperation they were receiving and felt the organization was moving toward having effective and timely help from the "safety professionals" in BSHED. Although the DSRs believe the staff, for the most part, have taken the changes to heart and tried to execute their responsibilities well, the DSRs feel the organization is "not yet over the hump" towards having safety ingrained in the staff.

The LDs were the one group that appeared to speak with some reservation and hesitancy. Although they spoke some words of support for the recent changes in safety management, they seemed uncertain or unconvinced of the benefit of these changes to their work, as well as about where they were headed. It may have been that some were weighing how to embrace the changes because their role was still not well enough defined, and others were weighing whether to embrace the changes because they were not convinced of the benefits. In either case, more attention is needed with this group.

Commission Members

Paul A. Croce
  Former Vice President and Manager of Research (retired)
  FM Global

Kenneth P. Fivizzani
  Former Research Scientist (retired)
  Nalco Company

Tony Haymet
  Director, Scripps Institution of Oceanography
  Vice Chancellor – Marine Sciences, University of California, San Diego

Kenneth C. Rogers (vice chairman)
  Consultant
  Former Commissioner of the Nuclear Regulatory Commission (1987-1997)

Charles V. Shank, Sr. (chairman)
  Fellow, Janelia Farm Research Center
  Former Director, Lawrence Berkeley National Laboratory (1989-2004)

William VanSchalkwyk
  Managing Director, Environment, Health, and Safety Programs
  Massachusetts Institute of Technology

A. Thomas Young
  Former Executive Vice President
  Lockheed Martin Corporation (retired)