

NIST SAFETY COMMISSION
MINUTES OF THE WEDNESDAY, JAN. 4, 2023 AND THURSDAY, JAN. 5, 2023
HYBRID MEETING

ATTENDANCE: Virtual*

**NIST Safety Commission
Members Attending**

Bagian, James
Hill, Darryl
Hoffman, David
Jones, Allison
Kolly, Joseph
Merlic, Craig (Vice Chair)
Peters, Mark (Chair)

Designated Federal Officer

Shyam-Sunder, Sivaraj

NIST Leadership Board

Bahar, Mojdeh
Boehm, Jason
Brockett, Delwin*
Brown, Essex
Brown, Hannah
Chin, Joannie
Dimeo, Robert (Rob)*
Dowell, Marla*
Evans, Heather
Fangmeyer, Robert*
Gillerman, Gordon
Glenn, Rachel
Hooker, Stephanie
Huergo, Jennifer
Kushmerick, James (Jim)
Lawson, Jeremy
Locascio, Laurie
Mackey, Elizabeth
Olthoff, Jim
Porch, Susanne*
Pritchett, Jeanita*
Raghavan, Pravina*
Romine, Charles (Chuck)
Schufreider, Jim
Vaughn, Robert (Skip)
Wixon, Henry

Office of General Counsel

Chung, Jennifer*

NIST Safety Commission

FACA Secretariat:

Lloyd, Corrine
Travis, Dalia
Evans, Tracy (Energetics)
Pellegrino, Joan (Energetics)
Voss, David (Energetics)

NIST Staff

Arrisueno, Gladys
Artusio-Glimpse, Alexandra*
Bald, Kevin
Bareham, Scott
Benz, Sam*
Berilla, Michael
Blumer, Mike
Boateng, Francis
Boisvert, Ron
Bowers, Chuck
Brand, Paul
Brass, Brian*
Brown-Giammanco, Tanya
Bundy, Matt
Caraway, Jessica*
Cleveland, Megan
Corwin, Kristan*
Cronise, Mark
Cullum, Justin
Davis, Cher
Dennis, Christopher*
DeRocher, Karen
Duff, Shannon*
Duong, Han
Elliott, Robert (Dan)
Falco, Joe
Farrell, Alex
Fasolka, Mike*
FitzPatrick, Gerald (Jerry)
Fraser, Jerry
Frechette, Simon
Garey, Wesley
Gilmore, Dan
Greer, Christopher*
Halacsy, Attila
Hall, Michael
Hamid, Mustafa (Moose)*
Haynes, Ross

Healy, Bill
Herron, Matthew
Hoehler, Matthew
Jayson, Alicia*
Johnson, Bruce
Jurrens, Kevin
Kirby, Brian
Leventon, Isaac
Liau, Mark
Lowe, Darren
Mattes, Dan
McCollum, Chad
Midzor, Melissa*
Mitchell, Adrian
Moffitt, Stephanie
Nanninga, Jay
Ng, Cuong
Orr, Dereck*
Percy, Meghan
Plusquellic, David*
Prothero, Jack
Rentz, Nikki*
Retka, Patricia*
Robinson, Angela
Robinson, Liz
Scholl, Matt
Shupe, Janna
Slattery, Oliver
St. Pierre, Jim
Stauffer, Ted*
Sung, Lipiin
Szakal, Andrea
Szalai, Veronika
Tarlov, Mike
Tarr, Jared
Thompson, Brian
Trechette, Simon
Tyra, Mark
VanLandingham, Mark
Varadi, Laslo
Wavering, Al*
Weidenbach, Keith*
Wims, Michelle
Wing, William
Wu, Jo
Yang, Jian
Yashar, Dave

Wednesday, January 4, 2023

Call to Order, Roll Call, and Opening Remarks – Mark Peters, Chair, NIST Safety Commission

Dr. Peters called the meeting to order at 9:00 a.m. and took roll call. All seven Commissioners were present, and Commissioners introduced themselves. Dr. Peters reviewed the meeting logistics. He explained that the Wednesday morning session, public comment period, and working sessions will be broadcast by video, provided instructions for those joining virtually, and noted that the meeting will be audio recorded for the purpose of preparing the meeting minutes. He provided the NIST Safety Commission website link, www.nist.gov/director/nist-safety-commission, where the agenda and presentations are available online. Dr. Peters gave an overview of the two-day agenda and introduced speakers for the morning session. He then introduced Jennifer Chung, Senior Counsel for Advisory Committees, to provide a FACA briefing, after which, he introduced Dr. Laurie Locascio, the Under Secretary of Commerce for Standards and Technology and NIST Director, to provide a welcome and the charge to the Commission.

Welcome and Charge to the Commission – Dr. Laurie Locascio, Under Secretary of Commerce for Standards and Technology and NIST Director

Dr. Locascio thanked the Commission members for their participation in the NIST Safety Commission and for contributing their time and expertise. She introduced each of the Commissioners and highlighted each member's respective safety experience. She explained that over the course of the two-day meeting, Commissioners would hear through presentations and focus groups how NIST works to keep staff members safe, as well as its safety challenges, near misses, and failures.

She described that NIST has a unique mission, conducting research that is done nowhere else, that brings unique challenges. Two safety incidents motivated her to establish the Commission. The first happened last year before she returned to NIST as director. On February 3, 2021, NIST had an unplanned shut down of a research reactor in the NIST Center for Neutron Research. A single fuel element overheated and was damaged because it was not securely latched into place. NIST staff responded as they had been trained, all safety systems worked as designed, and the public was safe at all times, however the incident was very serious and should not have happened. Over the past 11 months, NIST has been working closely with the Nuclear Regulatory Commission (NRC) and internal and external experts to understand what went wrong and ensure it does not happen again.

The second incident happened on September 26, 2022 and tragically resulted in the death of a staff member, the first in-service death of a staff member in nearly 100 years. This experienced staff member was killed in a fall from an elevated height when part of a research structure collapsed. For this, two investigations are underway, one by the Occupational Safety and Health Administration (OSHA) and another by NIST's Office of Safety, Health, and Environment (OSHE) which is conducting a root cause analysis. Dr. Locascio said that while NIST must wait for the results of the investigations to know what caused the tragedy, she feels that NIST cannot wait to examine its safety practices and culture. Immediately after this incident, she called for a safety stand down, in which NIST reviewed job hazard analyses and safety hazard reviews, and she called for this new safety commission to be established.

Dr. Locascio charged the Commission with assessing the state of NIST's safety culture and how effectively the existing safety protocols and policies have been implemented across NIST. She asked the Commission to evaluate the quality and completeness of NIST safety directives and programs, performance of safety protocols and the responses to recent incidents and near misses, and the impacts of the pandemic and the hybrid work environment on NIST's safety culture. Dr. Locascio said the Commission should consider perspectives of the NIST staff and management, NIST's responses to significant safety-related incidences, and near-misses involving NIST employees and associates, findings from investigations and reviews of incidents, implementation of corrective actions to prevent future

incidents and improve safety performance, and actions taken to strengthen the safety culture at NIST facilities.

Dr. Locascio noted that the Commission's timeline is tight because time is of the essence. The Commission will convene approximately three times over a 150-day period and requested a preliminary report within three months. NIST held a preparatory meeting in December to orient the Commission; slides from that meeting and this meeting are both on the [NIST Safety Commission website](#).

NIST's work is critical to supporting the nation's global competitiveness at a time in which the United States is experiencing its fiercest competition economically. She asked the Commission look at the tough questions—Is NIST doing the right things? Are its safety programs strong? Do staff follow the programs? Is the culture strong? As the agency is asked to do more, and as it grows and expands, Dr. Locascio noted, NIST has to do things safely.

For more information, see [Dr. Locascio's presentation](#).

Discussion. NIST Safety Commission members discussed the following topics:

- Timing of the OSHA report and internal OSHE report, to inform Commission proceedings

NIST Safety Management System – Dr. Elizabeth Mackey, Chief Safety Officer and Director of the Office of Safety, Health, and Environment (OSHE)

Dr. Mackey provided an overview of NIST Safety to Commission members. She provided information on the safety management systems, core programs, performance metrics, recent events, safety culture, and risks, opportunities and NIST's action plan.

For the safety management system, Dr. Mackie described the roles and responsibilities, requirements, and communications, such as the safety education and training provided to NIST staff. She provided details on the process to define, mitigate, and manage hazards. She also reviewed workplace inspections and the incident reporting and investigation program along with the associated roles and responsibilities and tracking system used in that program. She described the Management Observation Process ("MOP"), which promotes safety through visits and conversations between staff and line managers. She provided details on performance metrics that are monitored to inform any necessary adjustments. Dr. Mackie gave an overview of recent serious safety-related incidents, to be addressed further by Dr. Dimeo and Dr. Chen, and shared NIST's strategy and actions to improve safety and noted that NIST has launched a safety culture program and is currently conducting a safety culture survey through a third party. Lastly, she reviewed NIST's safety related risks and opportunities and key elements of the FY23 Safety Action Plan.

For more information, see [Dr. Mackey's presentation](#).

Discussion. NIST Safety Commission members discussed the following topics:

- Roles and responsibilities for NIST's safety management system (for example, Executive Safety Committee, Safety Advisory Committee, Division Safety Representatives)
- Consideration of safety in evaluating staff performance and hiring staff
- Process for conducting Safety Culture Survey through the National Safety Council
- Staff responsibilities in safety investigations and corrective actions
- OSHE involvement in safety investigations and workplace inspections
- Avenues available for staff to raise safety concerns
- Tailored safety training for management versus technical staff

NIST Center for Neutron Research Safety Briefing – Dr. Robert Dimeo, Director, NIST Center for Neutron Research

Dr. Dimeo provided a brief overview of the NIST Center for Neutron Research (NCNR), one of two major neutron user facilities in the United States. NCNR has a major neutron user program with 30 instruments, many of which are dedicated for materials research as well as physics. He noted that about 40% of scientific research in the U.S. involving neutrons is conducted at NCNR. Neutron measurements are in high demand, and when NCNR is fully operating, the center accommodates about 50 companies per year and about 3,000 research participants from industry, government, and academia.

Dr. Dimeo described a safety incident that occurred in the NCNR, an unplanned shutdown on February 3, 2021. Fission products were detected in a confinement building upon normal reactor startup causing the reactor to automatically shut down. Ten staff members in the confinement building were decontaminated and sent home. Though this was a serious incident, there were no health or safety impacts to the staff, public, or environment. The reactor remains shut down until NIST completes reactor readiness work and the Nuclear Regulatory Commission (NRC) authorizes its restart. In addition, there was a serious safety incident the following day when re-entry by staff was aborted due to elevated carbon dioxide, which had settled into the lower levels of the confinement building.

Dr. Dimeo described actions taken to determine the root cause of the incident and to identify corrective actions and program improvements to prevent recurrence. NCNR conducted a Technical Working Group Investigation involving reactor operators, engineering staff, and safety staff to identify root cause and to propose corrective actions. NIST also conducted a Safety Evaluation Committee Investigation to review the Technical Working Group report and proposed additional corrective actions and program improvements. In addition, NIST engaged four expert External Consultants to review NIST's investigations and organization-wide response to the incident. The NRC also conducted a Special Inspection and issued a report. NIST further conducted a CO₂ Exposure Investigation to determine root causes and proposed corrective actions.

Dr. Dimeo reviewed a broad set of corrective actions that NIST has identified in four areas: Instruments, Equipment, and Tools; Qualifications and Training; Procedures; and Management Systems. He provided examples including visual inspection requirements after latching fuel elements, updating training requirements, re-writing procedures, adding a fifth shift of operators for training and maintenance, developing an employee concerns program, establishing a nuclear safety culture improvement program, and benchmarking against other reactors and other facilities. NIST also continues to address requirements from an NRC confirmatory order that is now part of its reactor license. He shared recommendations from the External Consultants Investigation and subsequent actions by NIST, as well as issues related to infrastructure, IT, and telework that impact safety and culture at NIST.

For more information, see [Dr. Dimeo's presentation](#).

Discussion. NIST Safety Commission members discussed the following topics:

- Implications of remote work and telework on laboratory operations
- Corrective action program, and how it has been overhauled subsequent to similar past incidents to be able to identify root causes and take appropriate corrective actions.

Engineering Laboratory Safety Briefing – Dr. Joannie Chin, Director, Engineering Laboratory

Dr. Chin provided an overview of the Engineering Laboratory and its mission as well as the fire research program at NIST. The National Fire Research Laboratory (NFRL) includes the original lab built in 1973. NIST's investigation of the World Trade Center disaster highlighted the need for a facility that had the capability of studying fire performance of full-scale structures. In 2015, NIST completed a major expansion of the NFRL to provide the critically needed, unique capabilities to study fire and structural

response on a realistic scale and inform performance-based building design methods and standards in this field.

She provided examples of experiments conducted at the NFRL, which has conducted full scale fire experiments and structural fire experiments, and described the results of the research from those large scale experiments. Findings have provided guidance to design engineers and safety professionals and have led to improvements in building codes and standards.

Dr. Chin provided an overview of the NFRL's safety challenges and policies. She described the facilities and major hazards. NFRL uses the same safety management system applied throughout NIST, such as general and role-specific projects and project-specific training, biannual workplace inspections, incident reporting, and the annual management observation program which involves visits of the workspaces and activities. The facility also has additional safety measures in place, for example entrance into the facility is limited to only authorized personnel, each experiment must have an approved hazard review in place with approved standard operating procedures and requirements, a safety operational checklist and safety briefing prior to each experiment, and a large built-in fire suppression system. The NFRL also uses NIST systems and programs to develop hazard reviews.

Dr. Chin gave a high-level summary of a workplace incident that resulted in the death of a NIST employee at the NFRL in September 2022. She stated that two investigations are in progress, one by the Occupational Safety and Health Administration (OSHA) and the other by NIST's Office of Safety, Health, and Environment (OSHE). The newly expanded facility with the full-scale structural testing capability remains in stand-down mode and all experiments are on hold indefinitely.

For more information, see [Dr. Chin's presentation](#).

Discussion. NIST Safety Commission members discussed the following topics:

- Determination of risk ratings for hazard reviews
- Hazard reviews of emergency response procedures and systems
- Safety scenarios to identify and analyze unanticipated events

Focus Groups

The NIST Safety Commission held a series of focus group sessions to gather information on safety at NIST. Focus groups included a total of 74 participants from across the organization. Each focus group included a facilitated discussion with four to five pre-established questions for response by participants, followed by approximately 20 minutes for Commission members to ask additional questions. Focus group participants included the following groups:

- Organizational Unit Directors (8 focus group participants)
- Division Chiefs (13)
- Members of the Office of Safety, Health, and Environment (10)
- Members of the Office of Facilities and Property Management (8)
- Long-Tenure Scientists and Division Safety Representatives (14)
- Early- and Mid-Career Scientists (13)
- Technicians (8)

Three subsets of four to five identical questions were customized for management (OU Directors and Division Chiefs), OSHE staff, and all other focus groups. A professional, third-party facilitator David Voss conducted the focus groups discussions. Focus group questions are included with the minutes provided below for each focus group, and all questions are included in Appendix A.

At the start of each focus group discussion, the facilitator provided an overview of the session and asked participants to introduce themselves and their role at NIST. The facilitator then presented ground rules for discussion, i.e., reserve judgement on responses shared during the discussion, one person to speak at a time, everyone to have opportunity to speak, responses to be kept to 1-2 minutes in duration, top

response to be shared in the case there are multiple possible responses, responses that add information to others' responses are acceptable (versus repeating what others have already said), session recordings to be used for note-taking purposes only, no attribution of statements to individual participants in meeting outputs (e.g., minutes).

Focus Group 1 – Discussion with Organizational Unit (OU) Directors

Facilitated Discussion Questions:

1. As OU Directors, how do you determine safety success in your respective area?
2. What is the safety reporting system and how is the reporting output used to identify actions? How do you ensure accountability as a leader? Please provide a few specific examples.
3. What is the hazard identification process at NIST? What is the process to determine acceptable risk?
4. What are 1-2 opportunities to improve safety performance? What is the overall strategy and timeline to ensure safety continuous improvement?
5. What keeps you awake at night regarding safety?

Key topics and themes:

- Fostering an open environment where people can raise and discuss safety concerns
- Ways to maintain visibility and awareness of safety in communications, meetings, and conversations
- Recognition of staff for safety prevention, identifying problems, and helping to find solutions
- Diversity of perspectives (drawing from both long-time experience and “fresh set of eyes”)
- Executive Safety Committee, coordinated by OSHE, through which OU Directors share information across labs
- Process for identifying and assessing hazards, levels of hazards, and hazard mitigation
- Safety issues related to complacency and ability to identify new potential hazards
- Management Observation Process (MOP) visits, scheduling, and challenges in observing experiments
- Varying types of hazards across labs and labs versus offices, awareness of hazard reviews across Organizational Units, as well as among others using shared laboratory spaces
- Review of lower-level hazards controlled with administrative controls and potential to raise hazard level for some
- Managing risk while accomplishing the mission; determination of “acceptable risk” and differences across organization; “Swiss-cheese” model of safety to enhance reliability and redundancy
- Interim solutions (including work arounds) to mitigate safety risks until funding is available for infrastructure or equipment repair, renovation, or replacement; determination of acceptable risk for work arounds versus standard operating procedures
- Communicating more with examples of how safety is funded across the organization; identification and follow through on “warning signs”
- OSHE’s role in incident investigations and training provide on root cause, and OSHE’s experts can help define standard operating procedures, identify hazards, etc.
- Emergency services and response in Boulder to different Gaithersburg offices; different risks between Gaithersburg and Boulder locations
- Benchmarking and learning from other organizations

Focus Group 2 – Discussion with Division Chiefs

Facilitated Discussion Questions:

1. As Division Chiefs, how do you determine safety success in your respective area?
2. What is the safety reporting system and how is the reporting output used to identify actions? How do you ensure accountability as a leader? Please provide a few specific examples.

3. What is the hazard identification process at NIST? What is the process to determine acceptable risk?
4. What are 1-2 opportunities to improve safety performance? What is the overall strategy and timeline to ensure safety continuous improvement?
5. What keeps you awake at night regarding safety?

Key topics and themes:

- Openness about safety and communication is critical; ability of staff to voice safety concerns versus operational pressure
- Staff recognition and accolades for safety, e.g., nominations for exceptional safety performance awards at division and OU levels
- Time frame for completing hazard reviews
- Hazard assessment system in which researchers categorize hazards in their operations based a risk assessment matrix, and risk assessment roles and responsibilities.
- Challenges with entering and finding information across multiple safety IT systems with overlapping purposes and activities
- Challenges with approving staff to do an activity in the Hazard Review System, finding associated requirements and trainings individuals have completed
- Challenges viewing individuals approved for projects or equipment regardless of group or division of supervisor
- Staff from different groups in shared laboratory, unable to view their safety training and know their understanding of the hazard reviews
- Division Safety Officers (DSRs) help with safety, e.g., help Division Chiefs coordinate walkthroughs and safety inspections, compile reports, mitigate specific risks, and use safety IT systems.
- Interim solutions to mitigate safety risks (including workarounds) until funding available for infrastructure or equipment repair, renovation, or replacement
- Safety impacts of infrastructure-related unplanned outages which are increasing in frequency (e.g., HVAC, flooding)
- Recipients of Incident Reporting and Investigation System (IRIS) reports; use of IRIS reports in division safety meetings to drill deeper into specific topics
- Complexity of incident reporting requirements and implications for underreporting of minor incidents and near-misses; streamlined/easier process to capture minor incidents and near misses
- Potential impacts of telework with fewer people working in laboratories and sharing of expertise through in-person presence/availability
- Knowledge transfer of safety information and instilling safety culture for new hires, new NIST Associates, students, and a growing NIST workforce in general
- Keeping pace on safety in laboratories with evolving experiments, instrumentation, and equipment

Focus Group 3 – Discussion with Members of the Office of Safety, Health, and Environment (OSHE)

Facilitated Discussion Questions:

1. What is your role (OSHE) to improve workplace safety at NIST? How does executive leadership support OSHE to achieve safety goals and objectives?
2. How does NIST and OSHE use safety reports and applicable metrics to improve safety performance? How are reports and metrics communicated to NIST? How does OSHE determine safety success?
3. How are workplace hazards identified and corrected in a timely manner?
4. Who administers and monitors the incident investigation process? How are any corrective measures implemented in the workplace?

5. What is your view of a strong (progressive) safety culture? Does a strong safety culture exist at NIST? If yes, please provide a few specific examples. How receptive is the scientific staff (scientists and technicians) to safety mandates pushed by OSHE?

Key topics and themes:

- Inconsistencies in focus on safety by staff, and strong influence of first line managers and group leaders on team's focus on safety
- Adequacy of safety culture; enthusiasm for OSHE safety mandates; reactive versus proactive approach to safety; top-down safety leadership
- Need for user-friendly IT systems to enable easy incident and near miss reporting; challenges with IT system integration and compatibility for training and safety
- Workplace Inspection Program limited to physical hazards; does not look at activities
- Frequency of MOP visits, limitations in observation of performance of activities in progress, and coaching for managers by safety professionals during the observation process
- Ownership and qualifications for assessing potential hazards, need for management review based on likelihood and level of severity, perceived that people gave lower ratings for likelihood and potential severity than merited, example of past of experiments that were scaled up after hazard review approval for experiments at smaller scale
- Opportunity for staff to involve OSHE, which is often not requested to assist with hazard review assessment, instead, line management and DSRs are reviewing hazards; they may not have the safety background to judge and quantify the hazards and implement best work practices for the hazards.
- Differences in some hazard evaluations between Gaithersburg and Boulder locations (e.g., in radiation safety)
- Need for confirmation that procedures and protocols defined in hazard assessment review are followed
- Staff much better at identifying hazards than mitigating them; items are closed out based on corrective actions that are postulated in the future versus those that have been implemented
- Concerns whether those conducting investigations have proper training and expertise to assess root cause and determine appropriate corrective actions
- Incident reporting, closing out corrective actions, and ability to check that corrective actions and measures are completed
- Concerns over response time and ability to correct identified safety deficiencies in a timely manner
- Inadequate use of safety metrics which are shared with the Executive Safety Committee
- Need for demonstration of safety progress (address hazards and preventative maintenance), and need for communication of progress in response to safety input, feedback, surveys
- Access to expertise for radiation safety is available, both in house and via community resources; NIST holds two separate licenses from the NRC and the safety of activities subject to those licenses are governed by NRC rules and regulations. NCNR holds the license to operate the research reactor and OSHE holds a license for radioactive materials used at NIST; the incident at the NCNR in February 2021 was governed by the NCNR license to operate the research reactor.
- Making online training more interactive; expansion opportunities to improve refresher training and annual job assessment for safety personnel to ensure receiving program safety training

Working Session

Dr. Peters welcomed back the NIST leadership team and thanked NIST for arranging the opportunity for Commission members to meet with NIST staff through focus groups. During the session, Commission members asked questions of the leadership team to gather additional information.

Discussion. NIST Safety Commission members discussed the following topics:

- OSHE training provided to personnel involved in safety incident investigations
- Involvement of OSHE staff in investigations and in conducting QA/QC for investigations

- Prioritization process for allocating funding for NIST facilities and infrastructure that considers mission, impact, safety, and other factors
- Use of a risk matrix based on best practices from other agencies to determine risk score for safety-specific projects; funding is determined by score and funding available in a given year; significant backlog due to funding availability
- Communication of funding prioritization process and rationale for allocation decisions
- Inspection close-out process and confirmation that corrective actions are completed, follow up that is included in next scheduled inspection and repetition of same issues appearing
- Challenge of determining probability of a hazardous event occurring in risk hazard assessment

Thursday, January 5, 2023

Call to Order – Mark Peters, Chair, NIST Safety Commission

Dr. Peters called the meeting to order and welcomed Commission members and focus group members to the second day of the NIST Safety Commission meeting. He then turned the meeting over to David Voss to begin the fourth focus group discussion.

Focus Groups (Continued)

Focus Group 4 – Discussion with Members of the Office of Facilities and Property Management

Facilitated Discussion Questions:

1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety?
2. What does personal accountability mean to you specific to safety? How do you ensure the safety of your colleagues and peers? Please provide a few specific examples.
3. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures?
4. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence?
5. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.

Key topics and themes:

- Emphasis on conveying to staff importance of safety to achieve mission
- Discourage treatment of safety as a standard or that it is about compliance; compliance is not good enough
- Daily walk throughs to inspect facilities and equipment, and use of morning “stand up talks” to review procedures for the day, field questions, and discuss any hazards that arise
- Need for review of prioritization of projects with safety risks, concerns about descoping of project to complete contracts in execution, resulting in discontinuing remainder of renovation project with potential impact on air quality for staff, as example
- Effect of aging infrastructure and implications of ongoing or deferred maintenance and repairs on staff morale and excitement for and confidence in safety culture; also the time and effort to develop and execute interim solutions (including work arounds) until funding is available for infrastructure or equipment repair or replacement, as example, tripping hazard and use of warning tape to address in interim, or water dripping and use of a bucket; sense that much of facility staff bandwidth is spent on interim solutions related to aging infrastructure and deferred repairs; some staff minimize time in labs where there are air quality concerns; heating issues in warehouse and sense that higher priority given to research and labs
- Prioritize investment for infrastructure master plan

- Mitigation of slips, trips, and falls
- Accountability and reprimands when safety protocols are repeatedly not properly followed; noted “repeat offenders” provided with training and counselling, but no reprimand, also, same safety issues appear repeatedly in laboratories (e.g., not wearing correct protective equipment with lasers, issues with cylinders)
- Aging workforce
- Training to ensure that staff, lab users, consultants, and contractors are familiar with the different risks across labs, offices, and construction sites
- Mentorship to ensure staff can identify what they learned in PowerPoint training
- Inclusion of safety in hiring process to understand candidate’s seriousness with safety, background, and qualification
- Challenge in hiring and finding qualified job candidates, short-staffed team increases risk; for example, authority having jurisdiction (AHJ) function which is responsible for safety of buildings for their intended occupancy is short-staffed
- Ensuring safety training requirements are completed by new hires within specified timeframe
- Successful example of Boulder meetings between operational staff and lab staff to discuss safety issues and priorities for investment

Focus Group 5 – Discussion with Long Tenure Scientists and Division Safety Representatives

Facilitated Discussion Questions:

1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety?
2. What does personal accountability mean to you specific to safety? How do you ensure the safety of your colleagues and peers? Please provide a few specific examples.
3. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures?
4. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence?
5. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.

Key topics and themes:

- Open environment for staff to work collaboratively identify problems and solutions
- Role of first line managers, group leaders, and team leaders, in driving safety culture versus senior and middle management or division safety representatives; differences in expectations since some group leaders are proactive while others consider safety to be the job of the division safety representative
- Importance of leadership / management that truly cares about and is committed to safety as a top priority
- Need for easier way to report potential hazards
- Challenges with IT safety systems built in-house, tools not finished; difficulty accessing, need for systems that are simple, easy to use and access, interconnected and interoperable; and include automation to find out whether people have the correct safety training to do an activity in the hazard review; complexity of chemical inventory management system as example.
- In shared laboratory spaces, inability to view activity requirements, hazard reviews, and individuals approved if managed by another group or division
- Difficulty and time requirements associated with incident reporting system and implications for underreporting minor incidents
- Different requirements and expectations for authorization of qualified people and demonstrating proficiency across organization; based on supervisor judgement; some supervisors use hands-on approaches for standard operating procedures (show, watch, not watch); in some cases external

regulations may require observed demonstration of proficiency, or license, e.g., Nuclear Materials License authorization process requirements

- Interim solutions to mitigate safety risks (including workarounds) until funding available for infrastructure or equipment repair, renovation, or replacement; aging infrastructure as a contributing factor to potential safety incidents and safety risk to staff; Issues with ventilation, water leaks, replacing cranes
- Ongoing mitigation of risk of slips, trips, and falls; examples including water fountain leaks, cords, and when moving offices
- Appreciation of OSHE expertise, helpfulness, though some delays in ability to address issues; OSHE needs more staff and resources; some view OSHE as opponent (not invented in lab)
- Policies and procedures are thorough; desire for ongoing discussions, group or division meetings, or lab discussions on hazards or safety program; valuable beyond online training
- Lack of uniformity of safety expectations in performance agreements across different organizational units
- Need for changing way staff are evaluated for safety performance and completion of required training; some supervisors don't take it seriously despite repeated reminders
- Impact on safety by telework and having fewer people on site, concerns about people working alone in laboratories
- Opportunities to leverage best practices of similar organizations

Tours of the National Fire Research Laboratory, NIST Center for Neutron Research, and the NIST NanoFab

Commission members were provided brief guided tours of three NIST laboratories in Gaithersburg and had the opportunity to ask questions of the NIST personnel. At the National Fire Research Laboratory (NFRL), Commissioners walked through facility and viewed areas where fire experiments are conducted, both the original fire facility and the newly expanded facility with the full-scale structural testing capability. At the NIST Center for Neutron Research (NCNR), Commissioners viewed the national user facility that provides neutron measurement capabilities to the U.S. research community. Commissioners also viewed the NanoFab which provides researchers with access to commercial nanoscale measurement and fabrication tools and methods and help from technical support staff.

Discussion. NIST Safety Commission members discussed the following topics:

- Duration of experiments and sponsors of experiments at NFRL
- NFRL staff involvement in hazard analysis, IT tools, balancing timelines for experiments
- Proposals by users and project selection at NCNR, duration of projects, safety training for users, and NIST staff involvement
- Access control, safety training, and alarm and safety systems in the NanoFab

Focus Group (Continued)

Focus Group 6 – Discussion with Early and Mid-Career Scientists

Facilitated Discussion Questions:

1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety?
2. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures?
3. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence?
4. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.

Key topics and themes:

- Recognition and rewards for identifying safety vary across groups
- Differing environments for raising safety concerns by division or group
- Differing approaches to safety across divisions and groups, and laboratory versus office spaces
- Multiple different IT systems built in-house for training, procedures, and safety requirements
- Challenges with systems that are not interconnected and interoperable, inconsistencies in data across systems
- Difficulty in finding, accessing, and logging into safety training, safety information, and standard operating procedures
- Simplifying and streamlining safety information; flood of information, hard to follow requirements documents; significant paperwork requirements
- Elevate role of Division Safety Representatives and those who do safety walk throughs, enabling them to remedy some issues they identify
- Absence of evacuation coordinators makes it difficult to know what to do, e.g., in a fire drill
- First aid training for evacuator or other staff
- Subject matter expertise of those evaluating staff on passing training and demonstrating an understanding of the procedures and protocols; direct supervisor may not have relevant expertise; supervisors may have conflict of interest in wanting staff to be able to accomplish mission
- Hands-on training and being around those with experience to improve safety training retention versus online, PowerPoint-style training
- Recurring training sessions or training refreshers to avoid complacency
- Retirement and attrition, loss of senior, experienced staff and their institutional knowledge; need for knowledge transfer through hands-on work alongside experienced staff for observations, guidance, and mentoring and more documenting of procedures
- Integrating new hires, newer staff, and transferring knowledge in an efficient manner
- “Buddy” program in development, but is grassroots and consists of early career staff on own time
- Impact of telework and fewer staff available to connect with to learn or if help is needed

Focus Group 7 – Discussion with Technicians

Facilitated Discussion Questions:

1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety?
2. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures?
3. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence?
4. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.

Key topics and themes:

- Safety policies and procedures are very good
- Importance of frequent communications on safety and conveyed by immediate managers; some noted immediate managers have “greatest impact on culture, safety, and how actions are taken on the ground”; others noted communications on a weekly basis or only when issues come up
- Need for regular, ongoing review of hazards reviews and conversations with colleagues, groups, and divisions
- Differing environments for raising safety concerns by division or group, e.g., those who have been at NIST longer can raise issues, while others do not raise issues since they doubt that the issues will be addressed; suggestion for an anonymous comment box
- Ensuring safety, hazard awareness, and qualifications across different groups working in shared laboratory spaces; concern related to hazard review process and removing workspace managers who had control over the location where multiple groups work, now called space owners who no

longer having visibility into approval and authorization across groups to determine people qualified to work on projects or use equipment in shared space and groups lack visibility regarding hazards related to each other's work

- Mitigation of slips, trips, and falls
- Appreciation of OSHE expertise and helpfulness (helpful, experts, thorough, exemplary)
- Distance to medical office on campus from workplace
- Attrition and retirement of experienced staff and budget limitations for hiring, training, mentoring staff

Working Session

Dr. Peters noted that the Commission received a lot of valuable information over the two days and that all involved were committed to the mission and open with sharing their perspectives. Dr. Peters provided Dr. Locascio with a summary of the Commission's initial impressions and observations based on the presentations and focus groups; Commission members shared their remarks during the discussion.

Discussion. The group discussed the following topics:

- Ownership of safety by line management
- Safety expectations
- Tools needed for professional development
- Opportunities for experiential learning
- Risk management, responsibility, prioritization, and communication
- Unevenness and inconsistency of safety management across organization
- Qualifications for risk assessments and investigations,
- Impact of infrastructure and facilities on safety and staff morale
- Organizational approach to knowledge-transfer and mentoring
- Personnel management (aging workforce and retirements, hiring)
- Timeliness of hazard reviews, approvals, and implementing corrective actions
- Adequacy of Workplace Inspection Program and Management Observation Program
- Complexity of access to safety training and other safety resources via diverse IT systems
- Roles, Responsibilities, and integration of OSHE as a mission partner
- Safety compliance versus safe work environment as goals

Dr. Peters shared next steps, including plans to meet in person in Boulder, CO in March and again in Gaithersburg in late April or May. The Commission will first prepare an oral briefing on preliminary findings in March and will prepare its final report in June.

Dr. Locascio expressed her appreciation for the Commission members and their work over the past two days and for NIST staff members who participated and openly shared their perspectives. She thanked the Commission members and said she looked forward to their findings and recommendations.

Adjournment

The meeting was adjourned at 5:00 PM.

I hereby certify that to the best of my knowledge; the forgoing minutes are accurate and complete.

Dr. Sivaraj Shyam-Sunder, Designated Federal Officer, NIST Safety Commission

Dr. Mark Peters, Chair, NIST Safety Commission

Questions in the Facilitated Discussion for each Focus Group

Focus Group	Questions in the Facilitated Discussion
Organizational Unit Directors	<ol style="list-style-type: none"> 1. As OU Directors, how do you determine safety success in your respective area? 2. What is the safety reporting system and how is the reporting output used to identify actions? How do you ensure accountability as a leader? Please provide a few specific examples. 3. What is the hazard identification process at NIST? What is the process to determine acceptable risk? 4. What are 1-2 opportunities to improve safety performance? What is the overall strategy and timeline to ensure safety continuous improvement? 5. What keeps you awake at night regarding safety?
Division Chiefs	<ol style="list-style-type: none"> 1. As Division Chiefs, how do you determine safety success in your respective area? 2. What is the safety reporting system and how is the reporting output used to identify actions? How do you ensure accountability as a leader? Please provide a few specific examples. 3. What is the hazard identification process at NIST? What is the process to determine acceptable risk? 4. What are 1-2 opportunities to improve safety performance? What is the overall strategy and timeline to ensure safety continuous improvement? 5. What keeps you awake at night regarding safety?
Members of the Office of Safety, Health, and Environment	<ol style="list-style-type: none"> 1. What is your role (OSHE) to improve workplace safety at NIST? How does executive leadership support OSHE to achieve safety goals and objectives? 2. How does NIST and OSHE use safety reports and applicable metrics to improve safety performance? How are reports and metrics communicated to NIST? How does OSHE determine safety success? 3. How are workplace hazards identified and corrected in a timely manner? 4. Who administers and monitors the incident investigation process? How are any corrective measures implemented in the workplace? 5. What is your view of a strong (progressive) safety culture? Does a strong safety culture exist at NIST? If yes, please provide a few specific examples. How receptive is the scientific staff (scientists and technicians) to safety mandates pushed by OSHE?
Members of the office of facilities and property management	<ol style="list-style-type: none"> 1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety? 2. What does personal accountability mean to you specific to safety? How do you ensure the safety of your colleagues and peers? Please provide a few specific examples. 3. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures? 4. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence? 5. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.

<p>Long tenures scientists and division safety representatives</p>	<ol style="list-style-type: none"> 1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety? 2. What does personal accountability mean to you specific to safety? How do you ensure the safety of your colleagues and peers? Please provide a few specific examples. 3. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures? 4. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence? 5. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.
<p>Early and mid-career scientists</p>	<ol style="list-style-type: none"> 1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety? 2. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures? 3. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence? 4. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.
<p>Technicians</p>	<ol style="list-style-type: none"> 1. How do you identify workplace hazards? What is the process to correct any hazards and your role to improve safety? 2. What are the actions you take to ensure the safest and healthiest work environment possible? What is your view of current safety policies and procedures? 3. Based upon any data that you are familiar with, what area has a high probability for a safety event? What steps do you suggest to prevent an occurrence? 4. Are there any short-term and long-term actions you would recommend to improve the safety process in your area(s)? Please provide specific examples.