NIST SAFETY COMMISSION
MINUTES[1] OF THE THURSDAY, MARCH 9, 2023 AND FRIDAY, MARCH 10, 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
Adams, James
Bahar, Mojdeh
Boehm, Jason
Brockett, Delwin
Brown, Essex*
Brown, Hannah
Chin, Joannie*
Dimeo, Rob*
Dowell, Marla
Evans, Heather*
Fangmeyer, Bob*
Gillerman, Gordon*
Hooker, Stephanie
Huergo, Jennifer*
Kelsey, Richard
Kushmerick, James (Jim)
Lawson, Jeremy*
Locascio, Laurie
Mackey, Elizabeth
Molnar, Mike*
Olthoff, James
Porch, Susanne*
Romine, Charles (Chuck)
Schlatter, Katie
Stephens, Michelle
Vanek, Anita
Vaughn, Robert (Skip)
Wixon, Henry*

Office of General Counsel
Hermanowicz, Rebecca*

National Safety Council
Cannan, Crystal

NIST Safety Commission FACA Secretariat:
Lloyd, Corrine
Travis, Dalia
Evans, Tracy (Energetics)

NIST Staff
Beltz, John
Benz, Sam*
Berilla, Michael*
Blumer, Mike
Booth, Jim
Brass, Brian*
Camenisch, April
Chelen, Julia
Cheron, Jerome
Corwin, Kristan
Dennis, Chris
Derby, Lisa*
Dewey, Steven*
Donley, Elizabeth
Edelstein, Monica*
Fasolka, Michael*
Garrity, Dave
Goldfarb, Ron
Griffith, David*
Grove, Thomas
Hadler, Josh
Hickernell, Robert
Hoehler, Matthew*
Jay, Nanninga*
Jeerage, Kavita
Kellerman, Christina*
Krupinski, Dale
Lowe, Darren*
Lowell, Peter
Materese, Robin*
McCollum, Chad
Meritis, Dimitrios*
Midzor, Melissa
Miller, Samantha
Morgan, Kelsey
Nembach, Hans
Ng, Lisa*
Perkins, John
Press, Rich*
Rentz, Nikki
Rentz, Ross*
Retka, Patricia
Rippard, William
Shalm, Krister
Stupic, Karl
Szakal, Andrea*
Szakal, Christopher*
Thompson, Brian
Tisdale, Rinda*
Varadi, Laslo*
Wavering, Al*
Yashar, Dave*

[1] These minutes are a summary of the topics discussed and do not reflect detailed content of the discussions.

Thursday, March 9, 2023

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

Dr. Peters called the meeting to order and took roll call. All seven Commissioners were present, and the Commissioners introduced themselves. Dr. Peters introduced Delwin Brockett, Associate Director of Management Resources, who welcomed the Commissioners to the NIST Boulder campus and provided an operations safety overview concerning weather and environmental conditions, elevation, plans in case of evacuation or shelter-in-place, and COVID precautions. Dr. Peters thanked the NIST Director and team for hosting the meeting and shared instructions for participation for those who were in person and for those joining virtually. He noted that the meeting agenda and presentations are available on the NIST Safety Commission website link (www.nist.gov/director/nist-safety-commission), gave an overview of the two-day agenda, and introduced speakers for the morning session. Dr. Peters introduced Rebecca Hermanowicz of the Office of General Counsel to provide the annual ethics 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 Director's update to the Commission.

NIST Director's Update – *Dr. Laurie Locascio, Under Secretary of Commerce for Standards and Technology and NIST Director*

Dr. Locascio welcomed the Commissioners and thanked them for their dedication and continuing their work during this second meeting of the NIST Safety Commission. Dr. Locascio provided context about NIST's unique capabilities. As the National Metrology Institute for the United States, NIST has a responsibility to maintain the national measurement standards and disseminate the international system of units for the United States. NIST led the way in the global redefinition of the kilogram moving away from a physical artifact, which used to be a metal cylinder, to a measurement of mass based on fundamental constants, and now is leading the way toward the global redefinition of the "second" due to the incredible advances that NIST has made in its atomic clocks, NIST clocks lose less than one second in the life of the universe. NIST's advances in quantum science have led to four Nobel Prizes in the past 30 years, three of them in Boulder. And 50 years of NIST's cybersecurity research has resulted in the cybersecurity framework guidance, which is widely adopted nationally and has been translated into 10 different languages, most recently into Ukrainian at the start of the war with Russia as cyber threats started to intensify. NIST's mission is to promote US innovation and industrial competitiveness; the people at NIST are dedicated public servants committed to that mission.

NIST strives for excellence in its technical work, business solutions—and safety culture. Dr. Locascio noted the expertise, experience, and knowledge of the Commissioners and shared the goal to learn from the Commission to significantly strengthen NIST safety culture, safety management systems, and safety practices, and she emphasized that the entire NIST leadership team is engaged and ready to commit time and resources.

Extensive changes were made after a safety incident in Boulder over a decade ago; NIST built its safety program, dedicated staff and resources to safety, secured management buy in, defined roles and responsibilities, and empowered everyone at NIST to stop work based on safety. In reflecting recently, the NIST leadership team decided those efforts achieved safety version 1.0 and collectively agreed there is significant room for improvement and a desire to move to safety 2.0 and make safety integral in everything NIST does. Dr. Locascio commented on the Commission's draft preliminary findings and that one of the subcommittees noted that Covid may have impacted the organization's safety culture. NIST dedicated time and resources to protect its staff and had no evidence of transmission in those two years. She too feels that ground was lost during that time toward progress in a renewed safety culture.

She again introduced the Commission members, experts representing industry, academia, and with prior experience in government service. Dr. Locascio reiterated her comments from the January meeting, she has set an aggressive timeline for the Commission to assess the state of safety culture and how effectively the existing safety protocols and polices have been implemented across NIST. She

emphasized that establishing this Commission is one of the most important steps that NIST is taking to prioritize safety.

Dr. Locascio shared that the Commission will hear preliminary results from the recent NIST safety culture survey. NIST engaged the National Safety Council (NSC) to be able to benchmark against other organizations. She thanked Crystal Cannan from the NSC for agreeing on short notice to share the results of the survey with the Commission. The survey was conducted in two phases (due to approval timelines), with the first phase of feedback from federal employees and the second phase of feedback from associate staff members including guest researchers and contractors that make up about half of NIST's workforce. Commission members would hear about the preliminary results from the survey with federal employees, which had a 60% rate of participation.

She described the Commission's three subcommittees scheduled to present their observations and findings on the second day of this meeting. She noted that she looks forward to the integration of these efforts into the Commission's high-level consensus findings in a preliminary report at the end of March and the actionable set of recommendations to be included a final report in late May or early June.

Dr. Locascio also announced the establishment of a fourth subcommittee focused on the fatal accident that occurred on the NIST Gaithersburg, MD campus in September 2022. This subcommittee will conduct an independent review of the draft NIST investigation report on that incident when it becomes available in late March or early April. NIST's Office of Safety, Health and Environment (OSHE) is conducting the investigation to determine how it occurred, why it occurred, identify the contributing and root causes of the incident and develop a corrective action plan designed to prevent future incidents arising from these or other similar causes. Dr. Locascio asked the subcommittee to assess the quality and thoroughness of the incident investigation, the quality and thoroughness of the analysis of root causes and causal factors, and the applicability and robustness of the planned corrective actions. She thanked Jim Bagian, Darryl Hill, and Joseph Kolly, who will serve on the committee, and noted their deep expertise and experience in conducting major safety and accident investigations and serving in organizational roles as senior safety professionals. The subcommittee will provide a written report of its evaluation, including any recommendations for additional corrective and preventive actions for discussion at the Commission's third public meeting and the findings and recommendations will be included in the Commission's final report.

Dr. Locascio then thanked the more than 125 NIST staff members who are voluntarily participating in focus groups, listening sessions, and one-on-one discussions with Commission members. She also thanked NIST's OSHE staff members and Chief Safety Officer, Dr. Liz Mackey, for the hours they have spent compiling critical data and information for the Commission. She noted that Commissioners will hear from staff members in Boulder, visit laboratories, and hear from researchers in those labs. She reiterated that NIST staff and associates are the heart of NIST's mission and the reason for NIST's longstanding and well-known reputation for excellence, integrity and perseverance, NIST is committed to taking all measures necessary to mitigate risk and ensure the safety and well-being of the people at NIST.

For more information, see Dr. Locascio's presentation.

Discussion. NIST Safety Commission members discussed the following topics:

- Appreciation for Dr. Liz Mackey and OSHE for providing information to the Commission and the NIST team members involved in subcommittee visits, all of which were extremely informative and helpful
- Timing of the external OSHA report, to inform Commission proceedings

NIST 2023 Safety Culture Survey: Preliminary Results for Federal Employees – *Crystal Cannan, Director, Workplace Training and Safety Services, National Safety Council*

Dr. Peters introduced Crystal Cannan, director of workforce workplace training and safety services at the National Safety Council, to present the preliminary results of NIST's safety culture survey. Ms. Cannan

provided an overview of the National Safety Council (NSC). She covered the background of the NSC Safety Barometer, a well-established safety perception survey that the NSC has used for over 30 years. Through use of this survey, the NSC helps organizations understand their strengths and opportunities, facilitate employee engagement, and quickly prioritize an action plan. NIST worked with the NSC to conduct the Safety Barometer survey in December 2022 and January 2023 through an anonymous online survey; 60% of staff at NIST responded to the survey.

The survey has 50 standardized items that assess six key safety performance categories (in addition, NIST included employee demographic questions). The performance categories include: Management Commitment, Supervisor Engagement, Employee Involvement, Safety Support Activities, Safety Support Climate, and Organizational Climate. The NSC benchmarks survey results with other organizations in its database to present benchmarked percentile scores to compare NIST with 1530 other organizations on each of the 50 items assessed. The scale is zero to 100, and a score around the 50th percentile means the score is better than half of the 1530 business in the database. The database does not represent a national average. Businesses in the database are a self-selected group that have chosen to engage and partner with the NSC; this is a high performing group and a high benchmark. The NSC also compared NIST to similar industries: professional scientific and technical services, public administration and government, and education services.

Ms. Cannan then described NIST's survey results. NIST scored in the 63.2 percentile, meaning that NIST scored higher than 63% of the businesses in the NSC database. This is an above-average score that indicates a strong safety culture foundation with opportunity to improve. NIST's best-performing categories included supervisor engagement and organizational climate; opportunity areas include employee involvement and safety support activities. She delved further into strengths and focus areas identified through the survey. Ms. Cannan walked through NIST's 10 higher scoring components. She noted that the highest scoring items were "Supervisors acting on employee safety suggestions" followed closely by "Supervisors behaving in accord with safe job procedures." She noted that four of the high-performing components are "key drivers" (strongly correlated to higher overall scores) in the categories of Supervisor Engagement and Employee Involvement. She also noted that no Safety Support Activities components were identified in the top ranked strengths, indicating an area of improvement. Ms. Cannan then described NIST's lower performing components. She noted that four of the lower-performing components are "key drivers" and the lowest performing items were "Employees using standardized precautions for hazardous materials" followed by "Management setting annual safety goals." She added that seven of the ten lower-scoring components were identified as "high neutrals" (30% or more of respondents answered with neutral response rather than positive or negative) and suggested a need to increase employee awareness, knowledge, involvement, and visibility of these components if no deficiency is present.

Ms. Cannan shared results based on the additional demographic questions provided by NIST. Comparing by tenure, all workgroups responded positively, indicating overall positive perception regarding safety culture. She noted that employees with tenure of 21 years or more held more positive perceptions than others, and said that employees with tenure of 1-5 years held the least positive perceptions overall. She also reviewed a comparison by primary work location. All locations responded positively, employees who indicated 'Other' for location (94 people) had a more positive perception than Boulder (290 people) and Gaithersburg (1,545 people), and she noted that employees from Gaithersburg held the least positive perception overall (slightly less than Boulder). For responses by Organizational Unit (OU), the NSC will examine more closely the differences across groups in the final report. She said that all OUs responded positively and added that the Communications Technology Laboratory held significantly more positive perceptions than the Office of Safety, Health, and Environment, and shared that she often sees similar results for safety professionals, who are critical and focus on safety incidents and noted the importance of engaging this group in action planning conversations. Comparing by role, Ms. Cannan said results are again similar to what she sees elsewhere, that management/supervisors held more positive perceptions, and added that increased involvement of non-supervisor employees in safety discussion can help close gaps in perception.

For next steps, Ms. Cannan outlined the process which includes interpreting the results, communicating the results, action planning, managing action plans, and re-surveying to evaluate progress in the safety culture journey.

For more information, see Ms. Cannan's presentation.

Discussion. NIST Safety Commission members discussed the following topics:

- Timing of final results to be end of March or early April
- Results to include both responses from federal employees and associates
- Analysis of qualitative results will enrich quantitative findings
- Observed doubling of response rate compared with 2017 safety climate assessment survey
- Impact on results given change to third-party administration of survey and recent safety incidents
- Value of benchmarking and comparison to similar sectors
- Areas to look into include key drivers and lower-performing components
- NSC will provide NIST with its survey data and average score percent distributions for each item
- Recommended level of frequency for this survey, every other year is common
- Management and handling of hazardous materials appearing in lower-performing components

Listening Sessions

The NIST Safety Commission held a series of listening sessions to gather information on safety at NIST. Listening sessions included a total of 30 participants from across the organization. During each listening session, Commission members held a dialog with session participants to hear their perspectives. Listening sessions included the following groups:

- Boulder Technical Division Chiefs (7 listening session participants)
- NIST Boulder Laboratory Director and NIST Boulder Operations Director (2)
- Boulder Safety, Health, and Environment Division (9)
- Boulder Researchers on Safety Risk Analysis for Hazardous Materials, Processes, and Conditions (6)
- NIST Associates (6)

At the start of each focus group discussion, the NIST Safety Commission Chair provided an overview of the session and asked participants to introduce themselves and their role at NIST. The Chair noted that session recordings to be used for note-taking purposes only, no attribution of statements to individual participants in meeting outputs (e.g., minutes). The Chair described the format of the listening sessions as a dialogue between participants and the Commission, rather than a facilitated focus group. The Chair encouraged candid feedback and welcomed additional input after the session by communicating to the NIST Safety Commission's Designated Federal Officer, Shyam Sunder, for aggregating and anonymizing input and sending to the Commission.

Listening Session 1 – Discussion with Boulder Technical Division Chiefs

Key topics and themes:

- Challenges in getting people to stay up-to-date on training; some training viewed as a burden, especially that which is required but not customized/relevant for the division
- Maintaining up-to-date training not formally included in individual performance review, though instances of some supervisors lowering performance ratings due to incomplete training
- Difficult and cumbersome to view whether individuals have completed appropriate training because training, hazard review, and lab access systems are not connected; connecting these systems may also help individuals understand the importance of the trainings and encourage completion
- Complexity of systems that are not interconnected could result in safety issues due to difficulty in finding complete information across the multiple systems and the resulting potential to overlook information that is difficult to locate

- Challenges to log in and use the Workplace Inspection Reporting System (WIRS) resulting in some to users not entering data into the system
- Some OSHE recommendations not followed or executed, and facilities team is over-tasked and under-resourced; completion of facility work orders can take months or remain outstanding indefinitely (installing guardrails on roof, replacing light bulbs); unclear who has authority
- OSHE is a valued safety partner, input on safety inspections, regulations, subject matter expertise
- OSHE does not have expertise in every type of hazard in laboratories (e.g., magnetic fields, high voltage); laboratory scientists and researchers take on some safety responsibilities
- More clarity from OSHE on which safety upgrades are required would be helpful for prioritization; in some cases, more recommended solutions to address safety issues identified by OSHE is desired
- Recent mandate to update hazard reviews is productive, resulting in broader questions about process, whether process is being conducted safely, and what can be done to improve safety
- Hazard reviews in the laboratories and hazard review approvals do not require convening of relevant scientists, management, and OSHE; this convening approach practiced but inconsistently
- OSHE input on hazard reviews is helpful but not required of laboratories conducting these reviews
- Hazard reviews updates are required over time (e.g., calendar year) and when changes occur (equipment, move to new room), not when staff changes (new staff review the hazard review)
- Management Observation Process (MOP) requirements vary by division; some have specified number of MOPs to conduct annually while some do not and are unfamiliar with the term MOP
- Workarounds are used to address unresolved safety issues; also safety issues that need elevation would be raised to supervisors (laboratory directors)
- Inability to acquire prescription safety eyewear for associates due to limitations in ability to purchase individualized personal protective equipment (PPE) for associates (can acquire for federal employees)

Listening Session 2 – Discussion with NIST Boulder Laboratory Director and NIST Boulder Operations Director

Key topics and themes:

- Strong top management support of safety has encouraged strong supervisory engagement on safety; more communications and engagement with every level of staff could make safety more visible
- Boulder Operations meeting that convenes division chiefs and managers across the organization from the management resources and laboratory programs sides to identify and solve problems
- Successful collaborative examples of management resources and lab programs to address safety together (e.g., acquisition, deliver, and storage of compressed gases)
- OSHE is a valued safety partner. Level of engagement with OSHE varies by laboratory; some but not all labs require OSHE participation for hazard reviews; early engagement of OSHE suggested, if engaged too late in the process, safety findings may be viewed as disruption to plans and timeline
- More communications to all levels of staff about when to engage OSHE and the benefits that OSHE offers could be helpful; OSHE realizes the challenges working in older facilities and works to identify solutions
- Challenges with IT applications and systems that are not interconnected, workarounds with lab safety coordinator extracting information and saving to a central, accessible location for division to review
- Inability to acquire prescription safety eyewear for associates due to limitations in purchasing individualized PPE or safety equipment for Associates; not allowed pursuant to appropriations law. Associates at NIST on different contracts and grants, no single solution identified that would work across those agreements

- Safety issues that need elevation would be raised to OSHE and the Executive Safety Council; enterprise-level safety issues would be raised to supervisors
- Observed that safety professionals are not eligible for safety awards at NIST

Listening Session 3 – Discussion with Members of the Boulder Safety, Health, and Environment Division (BSHED), OSHE

Key topics and themes:

- OSHE available to assist but under-utilized; team members ready and eager to offer assistance and resources; hold a number of safety credentials and certificates and bring subject matter expertise
- Limited access to laboratory spaces, need permission to access; team members not authorized to insert themselves into processes to provide safety perspective
- Variability as to when OSHE is engaged, if at all; often not engaged up front when regulatory requirements should be identified
- Empowered to assist those who request assistance; feel limited in ability to proactively engage those who have not initiated contact, especially senior researchers
- While OSHE may not have expertise in every potential hazard, the team brings resources and safety expertise, and team has built up knowledge in various lab areas over the years
- OSHE inputs have been disregarded and overridden, OSHE lacks authority on safety issues as an office within the organization and at a management level
- Hazard reviews scratch the surface, not enough detail; not all people sign off; Relative Hazard Index (RHI) underestimated
- OSHE input or approval not required for all hazard reviews and risk assessments, therefore unaware of some hazards and risks; unable to access some completed hazard reviews (e.g., may learn about new equipment years into service or hazardous waste without a plan for end-of-life disposal)
- Coordination with Office of Facilities and Property Management (OFPM) important to ensure safety in facilities projects, but significant challenges exist collaborating with OFPM on safety-related issues and information sharing
- Concerns over inability to access labs to observe and conduct work inspections; safety issues that remain unfunded and unresolved; minimized ratings of hazard reviews to avoid additional approvals, lack of robust emergency plans, and lack of formal process to share lessons learned from the Incident Reporting and Investigation System (IRIS)
- Near-miss involving high voltage shorting event while a contractor was engaged in jackhammering concrete for a project; since then don’t have safety day in Boulder
- Safety culture is reactive, not proactive; get by till it is not; initial buy-in after 2008 plutonium incident plateaued and declined; takes an event to shake things up and get things done; don’t blame safety culture, blame organizational culture

Listening Session 4 – Discussion with Boulder Researchers on Safety Risk Analysis for Hazardous Materials, Processes, and Conditions

Key topics and themes:

- Engaging OSHE for guidance and subject matter expertise, work closely on safety inspections
- High volume of paperwork (safe operating procedures, hazard reviews, etc.) generated and entered into database, but concerns about whether documentation is used, evidenced by questions raised about topics that are clearly documented; supervisor approval indicates completion of this and completion of associated training, but no mechanism exists for individuals to confirm they have reviewed documentation
- Hazard review approach is inconsistent since the review is largely left to individual researchers and their group leaders and division chiefs

- Variability in OSHE engagement across labs and groups since OSHE involvement is not mandated; in some cases engaging OSHE, in other cases, scientists conduct full hazard review process; opportunity for writing these together with operational safety and health groups with both sides approving before activity goes live
- Large number of hazard reviews for any given type without the ability to easily highlight and communicate the small number of hazards to be most aware of; more likely a two-page hazard review is read versus a 20-page document
- Risk Hazard Index (RHI) values (1-4) determine who needs to review and authorize hazard reviews, but inconsistencies exist in RHI ratings; assessing severity and likelihood of occurrence is subject to interpretation and there is a lack of common definition of probability (better communication and examples would be helpful); also potential for individuals to minimize ratings; concerns that OSHE does not see some hazard reviews, their review not required for RHI 1 or RHI 2 to confirm that valuation is appropriate
- RHI 3 level experiments require Organizational Unit (OU) Director approval with input provided by a committee of people identified by OU safety program coordinator (e.g., subject matter experts, division safety representatives, safety personnel); RHI 4 is not acceptable, must put in sufficient control to lower it to an RHI 3 level
- Uniform approach needed for safe operating procedures; focus on safety and include mitigation; some written as an operator's manual so less likely to be read from safety standpoint
- Helpful when safety team has expertise in both safety and a technical background in the particular field being addressed
- OUs historically were given latitude to implement safety programs, e.g., some controlled to industry standard; resulting variability in OU approaches to hazard review and risk analysis; opportunity to standardize across labs
- IT systems and databases disconnected, more integration needed (e.g., connecting hazard database with door sign manager), starting to see some integration and improvements, e.g., dashboards
- Concerns about legacy materials, chemicals, instrumentation, and their proper and timely decommissioning and disposal; when staff retire or leave, legacy items transferred to other staff, challenges in carving out time to manage process to address this; OSHE involvement and interconnecting databases for inventory and tracking would improve situation
- Management of change questions and uncertainty on updating hazard reviews (set up mode, active, teardown, new experiments on equipment, etc.) and who is responsible and notified
- Safety training viewed as sufficient, though may depend on division and scheduling in person trainings from outside sources may take months
- Fewer experienced in-lab technicians, compared with even 10 years ago, makes it challenging for principal investigators to be present in multiple labs every day to enable and support safety roles

Listening Session 5 – Discussion with NIST Associates

Key topics and themes:

- Associates receive general safety training upon arrival at NIST, as well as training specific to the laboratory and equipment they will use
- Communications in group to encourage associates to speak out about safety issues they see to prioritize safety (e.g., never try to get around safety procedures to complete tasks faster); open dialogue and training on what is safe and unsafe, fostering a "safety instinct"
- Positive experiences with supervisors who are supportive advocates, though note the difference in the relationship with supervisor as an associate versus a federal employee
- Inability to acquire personal protective equipment (PPE) such as steel toed boots and prescription safety goggles/eyewear for associates; limitations in federal authority to purchase individualized PPE or safety equipment for associates poses a significant challenge
- Associates cannot conduct hazard reviews, enter information into IRIS and other systems or sign off which are reserved as a federal employee responsibility; associates also cannot be paid for travel to conferences

- Associate have not experienced other differences; they are integrated into activities and treated as equals
- Limited interaction with OSHE as a resource (e.g., advice on handling chemicals)
- An associate stated that some staff members expressed safety concerns because of their experience with an on-campus active shooter training

Working Session

Dr. Peters welcomed Dr. Elizabeth Mackey, Chief Safety Officer and Director of the Office of Safety, Health, and Environment for NIST. During the session, Dr. Mackey provided additional information for consideration by the NIST Safety Commission as the subcommittees refine their findings.

Friday, March 10, 2023

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

Dr. Peters called the meeting to order and welcomed Commission members to the second day of the NIST Safety Commission meeting. He told Commissioners of the lab tour and unrehearsed discussions with researchers in the morning, followed by the session for subcommittees to share their findings and observations and a working session in the afternoon.

Lab Tour – Wineland's Nobel and its Legacy

Commission members received a guided tour focused on physicist David J. Wineland and innovations based on his work. Wineland, a NIST staff scientist from 1975 to 2017, received the 2012 Nobel Prize in Physics "for ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems." In 1978, he demonstrated the trapping and laser cooling of ions to very low temperatures, which led to use of laser-cooled ions to build ultra-precise atomic clocks as well as advancements in the research areas of quantum information processing and high-precision, high-accuracy time-keeping and other fundamental physics measurements.

Unrehearsed Discussion with Researchers in Multiple Labs

Commission members visited four laboratories for unrehearsed discussion with researchers on their work and safety-related topics. Leads in each laboratory described their research, walked Commissioners through their laboratory spaces, and discussed safety with Commissioners.

***Atomic Devices and Instrumentation*,** Dr. John Kitching – Leader, Atomic Devices and Instrumentation Group, Physical Measurement Laboratory. NIST Safety Commission members discussed the following topics:

- Hazard analysis and hazard mitigations in laboratory
- PPE used by researchers
- Safe Operating Procedures posted on door
- Training of personnel in the lab to include new and visiting staff and for post-doctoral researchers
- Requirements when aligning a laser beam, laser-safety walk-throughs
- Continuous inspection and training on cable management
- Work orders and duration of completion
- Who authorizes work: lead scientist and safety coordinators

***Electromagnetic Fields*,** Dr. Christopher Holloway – Leader, Electromagnetic Fields Group, Communications Technology Laboratory. NIST Safety Commission members discussed the following topics:

- Hazards in laboratory
- Laser safety engineering controls including interlock systems and vertical beam transitions.

- Types of lasers, frequency of re-arrangement and safety protections in place
- Relationship with Safety office and lab staff

Fiber Sources and Applications, Dr. Nate Newbury – Leader, Fiber Sources and Applications Group, Communications Technology Laboratory. NIST Safety Commission members discussed the following topics:

- Hazards in laboratory and for work conducted outside of the laboratory (in the field)
- Safety measures for work conducted in the field
- Procedures in case of safety event requiring medical attention
- Access to the lab for conducting work
- Lighting issues in the laboratory

High Bay Facility for Fatigue and Fracture of Advanced Structural Materials, Dr. Jake Benzing – Materials Research Engineer, Fatigue and Fracture Group and Dr. Nik Hrabe – Project Leader, Additive Manufacturing Fatigue and Fracture Project. NIST Safety Commission members discussed the following topics:

- Hazard analysis and hazards in laboratory
- Safe operating procedures for frames
- Operation of test frames (presses); limited to certified trained personnel
- Load frame setup
- Training requirements for personnel in laboratory area
- Procedures in case of safety event requiring medical attention

Subcommittees – Findings and Observations

Dr. Peters welcomed back NIST Leadership for the session on subcommittee findings and observations. With only 90 minutes for the session, he welcomed any additional thoughts from NIST Leadership by sending them to NIST Safety Commission's Designated Federal Officer, Shyam Sunder, who will share those inputs with the Commission. He noted that the presentations to be shared do not yet represent a consensus view, are still in progress, and may change. These initial findings are meant to inform the consensus oral report that the Commission will deliver to the NIST Director later in March. The Commission met at NIST's Gaithersburg campus in January 2023, two of the three subcommittees returned to that campus for discussions with managers and staff, and the NIST has provided additional documentation at the request of the Commission. Dr. Peters thanked the NIST team and especially Dr. Mackey and her team for gathering and sharing safety information to inform the Commission's work.

Dr. Peters gave an overview of each of the three themes that the Commission is examining: safety management systems and processes, culture and safety, and facilities and infrastructure. He noted that the Commission formed three subcommittees to address specific areas within these themes because additional information was needed to inform the development of the Commission's findings and recommendations. He then passed the presenting over to the first subcommittee.

Dr. Joseph Kolly worked with Dr. Allison Jones on the *Subcommittee on Hazard Analysis and Risk Assessment* and shared their approach and progress. They reviewed relevant documents and materials, held discussions with NIST managers, and conducted one-on-one discussions with researchers. Before presenting findings, he noted that the format of their slides included seven findings that are subjective and represent expert opinion, followed by sub-bullets with the fact-based observations. Their subcommittee findings noted issues related to the (1) hazard review and approval system and (2) Risk Hazard Index assessments, (3) underutilization of OSHE and Occupational and Environmental Medicine physician, (4) issues related to the Enterprise Risk Management (ERM)/ERM Council in informing executive leadership's safety awareness, (5) lack of an audit process in NIST's safety management system, (6) concerns with OSHE's role and authority, and (7) a need for better tools, training, and expertise for researchers.

Next, Dr. James Bagian, who worked with Dr. Craig Merlic, presented their *Subcommittee on Incident Investigations, Corrective Actions and Follow Up* findings and observations. They also reviewed relevant documents and materials and met with NIST managers and researchers. Dr. Bagian presented findings and observations in four areas: (1) incident reporting, (2) incident investigations, (3) laboratory inspections, and (4) enterprise risk management (ERM), and for each area, the subcommittee provided additional detail on specific observations.

Then, Dr. Darryl Hill, who worked with Dr. David Hofmann, presented their *Subcommittee on Safety and Culture* findings and observations. They reviewed documents and materials related to the 2017 NIST Safety Climate Assessment results, met with Dr. Liz Mackey, Chief Safety Officer and Director of the Office of Safety, Health, and Environment, and reviewed preliminary results of the 2022/2023 NIST Safety Culture Survey for federal employees conducted by the National Safety Council. Dr. Hill presented their five findings: (1) general view of NIST safety culture not consistent throughout NIST, (2) there does not seem to be an ongoing measurement of safety culture and other related metrics to create a continuous improvement framework, (3) safety culture momentum has suffered due to the Covid pandemic, (4) gaps identified across various levels of management, and (5) facilities, safety training, and safety infrastructure.

For more information, see the Subcommittees – Findings and Observations presentation.

Discussion. NIST Safety Commission members discussed the following topics and themes:

- Opportunities to improve Management Observation Program (MOP) to strengthen safety program
- Clearly apparent dedication and passion of NIST and OSHE staff
- NIST does amazing science; good science is science done safely
- Making safety simple; not wanting to have compliance as a goal
- Commission to prepare actionable recommendations for NIST

Working Session

Dr. Peters shared the Commission's next steps with Dr. Locascio in preparation for the oral report to be presented to her at the end of March. Commissioners decided that each subcommittee will revise their findings, taking into account the discussions in Boulder. In addition, they determined roles and next steps for addressing several themes (highlighted at the start of the Subcommittee session) that need to be added to a specific subcommittee, have overlap with another subcommittee, or are outside of the scope of the subcommittees and still need to be fleshed out. The Commissioners shared their plan and timeline to update the findings and observations based on their discussions, consolidate and streamline the findings, and deliver their preliminary report to the NIST Director by the end of March.

Dr. Peters also introduced a Commission recommendation to the NIST Director. The recommendation, which was unanimously supported by all Commission members and approved by the Commission, states:

> The NIST Safety Commission recommends that the Office of Safety, Health, and Environment and all related Environment, Health, and Safety (EH&S) functions report directly to the NIST Director. Further, the Chief Safety Officer (CSO) should be a voting member of the Enterprise Risk Management (ERM) Council. Moreover, the NIST Director should make any other organizational changes needed to ensure the success of these specific recommendations.

Adjournment

The meeting was adjourned at 3:58 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