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DETAILS

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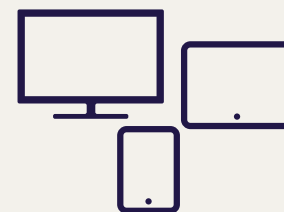
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Workplace Safety in Hybrid Federal Laboratories

Proceedings of a Workshop—in Brief

INTRODUCTION

Safety considerations constitute an essential component of laboratory-based research and development (R&D) operations. With the onset of the COVID-19 pandemic, laboratory staff transitioned to remote work. As facilities adopted hybrid work models, this shift in the research landscape also reshaped the traditional mentoring process, potentially reducing direct interactions among principal investigators, immediate supervisory personnel responsible for ensuring subordinate personnel satisfy safety requirements, safety representatives, junior researchers, and facility users. Simultaneously, the increased flexibility offered by hybrid work arrangements could enhance work-life balance options, thus removing barriers for individuals pursuing R&D roles, ultimately fostering a more inclusive work environment. Overall, the impact of these changes on safety cultures and practices remains unknown, necessitating potential adjustments. On August 15–16, 2023, the Laboratory Assessments Board convened a virtual workshop to investigate the influence of hybrid work environments on safety proficiency, cultures, and practices, all while upholding the highest standards of effort, performance, and relevance.

In opening remarks, Laurie Locascio, National Institute for Standards and Technology (NIST), said that while a hybrid work schedule seems ideal in theory, it also means that fewer people are at the facility. This, she said, creates safety concerns by decreasing opportunities to mentor people about how to approach safety and how each organization conducts its research activities.

SHIFTS TO THE HYBRID WORKPLACE: IMPACTS ON SAFE WORK PRACTICES AND SAFETY

Thomas Jefferson National Accelerator Facility

Johnathon Huff, Thomas Jefferson National Accelerator Facility (Jefferson Lab), presented an overview of the Department of Energy's (DOE's) 17 national laboratories, each with its own particular charge, ranging from multipurpose science, multipurpose security, and multipurpose environmental laboratories to single program science and energy technologies. In March 2020, Jefferson Lab suspended onsite operations and transitioned to remote work for the majority of staff members, resuming normal operations in March 2022. Huff stated the new normal at Jefferson Lab has 57 percent of the staff with remote work agreements, 10 people who are fully virtual, and approximately 43 percent dedicated onsite. There has been increased

internal job movement and attrition, with retirements being the primary driver for attrition, and more than 300 new employees, out of just over 800 in total, have joined the laboratory. This rapid change means that there has been a need to keep a pulse on Jefferson Lab's culture and deal with several challenges, such as connecting people, creating a community, allocating space, ensuring that work processes continue, and replacing expertise lost with the many retirements. At the same time, new hires can bring a fresh perspective to how Jefferson Lab addresses safety, while internal movement allows for sharing best practices across the organization. As change occurs, leaders are integrating safety into their new work practices.

An organizational survey indicated that staff valued transparency in decision-making and engagement with leadership, which Huff noted influenced how leadership engages with the workforce on safety topics and when safety-related events occur. Jefferson Lab has reintroduced its employee recognition and rewards programs, including a safety leadership award, and holds regular all-hands meetings with laboratory leadership, which include safety topics and lessons learned from safety-related events. Jefferson Lab is also piloting a new mentoring program to connect both onsite and remote staff with mentors.

Huff said Jefferson Lab used lessons learned from three near-miss safety incidents to engage staff in a weekly forum with leadership. Each of the seven forums had approximately 100 participants that engaged on safety topics and learned why the laboratory paused all high hazard work following the three incidents. He said the direct line to leadership the forums provide helped create relationships that have generated new safety ideas. Learning from one another has become a key component of the laboratory's safety efforts.

Leading in the "new normal" is different with a hybrid workforce, so he explained that Jefferson Lab established its JLab Supervisor Academy to provide new and experienced leaders with the skills to lead its diverse, high-performing teams; manage a hybrid team and set clear expectations; and create an inclusive safety culture.

An important feature of the Academy is getting leaders to interact with and learn from their peers.

Huff said safety events are evaluated from a human performance improvement perspective that considers error precursors such as time pressure, high workload, and lack of knowledge. "We recognize that organizational weakness contributes to a large portion of safety events," said Huff, who noted that safety training focused on human performance improvement will continue for all staff in fiscal year 2024. Jefferson Lab has reinforced its leadership's commitment to safety by reinstating a program of daily engagement with frontline supervisors, including through virtual walkthroughs with remote staff. This program provides leadership with an understanding of the resources needed to operate safely and staff with the opportunity to provide direct feedback on what they are seeing in the field. In addition, Huff, the Jefferson Lab director, and the Environment, Safety, and Health director hold monthly meetings with the laboratory's worker safety committee to review issues and decide on necessary changes.

Brookhaven National Laboratory

Jack Anderson, Brookhaven National Laboratory (BNL), said his facility has nearly 3,000 staff members conducting research. It also serves as a user facility. Today, BNL's hybrid posture is still evolving, with 63 percent of staff working onsite, 32 percent with hybrid work arrangements, and 5 percent working remotely from some 40 states. One challenge is ensuring that business decisions focus on safe and secure mission delivery. Another challenge is being fair and equitable to everyone while recognizing the diverse nature of BNL's science mission and its many distinctive mission objectives. "We realized that one size was not going to fit, so we allowed more latitude to our associate lab directors and our mission organizations to work toward figuring it out on their own," said Anderson.

A third challenge is managing expectations. Hybrid and remote work agreements, said Anderson, need to be based on function and not staff preference, creating inequities among staff that need to be managed. With the future of work across the country changing and the fierce competition for talent, BNL staff have new expectations

of flex-work as a benefit, which is not always possible. Hybrid and remote work arrangements also require a new model for mentoring staff and developing them to meet their potential, as well as onboarding the 40 percent of BNL's staff added since April 2020.

Anderson said a safe work environment includes multiple dimensions of the organization's culture and repeated, detailed surveys revealed how staff regarded BNL's attention to the different dimensions of culture as they relate to creating a safe work environment. One finding during the COVID-19 era was that BNL was not equipped to handle change as quickly as needed, and leadership is now focusing on how to make the work environment more conducive to change—for staff to be aware of change and more able to adapt to changing environments. A positive survey finding was that safety was a clear organizational strength.

BNL accepts that there are differing business needs for key aspects of telework/remote work in addition to their impact on culture and meeting its science mission, said Anderson. The desired outcomes going forward in a hybrid work environment are to respond to staff's need for a sense of belonging, socialization, vibrant collaboration, change interactions, and shared purpose, along with increasing productivity, providing staff development, and developing relationships with senior leadership. Equipping frontline supervisors with approaches to deal with various safety issues via in-person, experiential training has proven to be paramount for instilling principles conducive to a safe working environment. During the pandemic, when this training was paused, there was some slippage in terms of how frontline supervisors adhered to those principles.

Anderson said a new environment requires equipping managers and employees with new tools, and BNL developed a toolkit to help managers deal with the new work environment. It also created a variety of professional development opportunities for staff of all levels. Going forward, it will be important to continuously stress communication, staff engagement, and management presence; ensure a positive culture amid change, uncertainty, and fatigue; and focus on

employee well-being as an element of safety. He noted that BNL has a portfolio of safety metrics he reviews monthly with about 40 key organizational leaders.

Lawrence Berkeley National Laboratory

Michael Brandt, Lawrence Berkeley National Laboratory (LBNL), said culture reflects an organization's behaviors, traditions, values, and beliefs. LBNL's bases its work culture on its stewardship values, which reflects how the institution cares for the safety and well-being of its people and how it performs its research, maintains its facilities, and stewards the financial resources needed to complete its scientific mission. These values, he said, were essential throughout the COVID-19 pandemic, as LBNL sustained mutual respect, trust, and partnerships across the organization to ensure the health and safety of everyone.

Brandt said the foundational elements for creating a safety culture that protects everyone's health and safety are having line managers and workers plan and execute work together and for work teams to use risk management methods to anticipate and evaluate hazards and implement control measures. Important factors include having every line manager be responsible and accountable for work outcomes, for workers to raise safety concerns and pause work to ask questions, and to always assess risks and use hazard controls.

He said that early in the pandemic, LBNL established the following guiding principles to facilitate decision-making and keep employees safe during the transition to maximum telework, when 5,000 people working at the laboratory went to fewer than 250 people working onsite:

- Protect worker health and safety,
- Use scientific evidence and best public health practices,
- Be adaptable and be flexible,
- Prioritize mission-essential work requiring site access,
- Prepare for future work curtailments,
- Manage suspected and positive cases while maintaining confidentiality,

- Protect worker confidentiality, and
- Communicate transparently.

During the pandemic's early months, LBNL's leadership team of more than 400 people met weekly to discuss local case rates, changes to work practices and COVID-19 safety protocols, and the challenges managers and employees were facing. In addition, he said, employees followed LBNL's health pledge by completing a COVID-19 symptom check to attest to being symptom free prior to entering work and acknowledging the importance of using COVID-19 health and safety protocols to prevent virus transmission.

The guiding principles, said Brandt, helped the organization manage its response to COVID-19 surges and case rates in the community and understand the changes or adaptations needed to protect everyone. Weekly leadership discussions about the evolving work practice changes and adaptations contributed to improving LBNL's safety performance during the various pandemic phases. Managers listening to worker suggestions and acting on those suggestions that LBNL could implement were essential to psychological safety.

In June 2020, essential research and operations staff gradually returned to onsite work, but the combination of people being away from the laboratory for months and the presence of newly hired employees led to an increase in safety incidents and injuries, said Brandt. To address this problem, LBNL implemented Spring Training to prepare people to return to work during the transition, to work under COVID-19 safety protocols and adjust to the new work practices and operating conditions. He noted that leadership's expectation of high safety standards had not changed, but implementation methods shifted to deal with surges and changing public health practices.

Brandt said that before the pandemic, telework was uncommon at the laboratory. Today, approximately 65 percent of the staff is onsite each day, with those on a hybrid schedule working onsite 2 to 3 days per week. Flexible work, once uncommon, is the new normal and is a competitive advantage with respect to hiring.

Brandt said the role of managers and leaders changed during the pandemic. Lessons learned about the leadership qualities needed to manage risk included prioritizing well-being and psychological safety, facilitating team and bridge-building for all staff, listening to and acting on worker's concerns and suggestions, and taking responsibility to have crucial conversations and getting feedback from staff. Another important lesson was that mistakes are opportunities to learn and improve. In response to one accident and worker and manager feedback, LBNL now extends work deadlines to eliminate scheduling pressure, which can lead to shortcuts and accidents.

As the workplace continues to evolve and adapt to hybrid work conditions, so must safety culture, said Brandt. In an evolving workplace, resilience and adaptability are essential to a healthy safety culture. For example, LBNL continues to adapt and distill the Spring Training guidelines to meet the needs for the ongoing hybrid work environment. He noted that leaders and staff respectfully working together forms a basis for trust, which leads to team science that yields innovation, solutions, and results. Creating opportunities for real communication in a hybrid work environment is crucial for success, as is avoiding one-size-fits-all solutions. He added that early-career staff want to be onsite, be mentored, and interact with more experienced researchers.

NEW APPROACHES TO SAFETY CULTURE AND PRACTICES **Engineered Safety**

Robert Leland, Sandia National Laboratories (SNL), said his institution developed its engineered safety program in the mid-2010s following several serious accidents at the laboratory. Before that, SNL's approach to safety was to identify hazards and apply a set of engineered and administrative controls to minimize risk. The engineered safety approach identifies risks and explicitly manages those risks to prevent unacceptable consequences, with a strong preference for engineered solutions versus administrative solutions. Implicit in this approach is a deeper level of systems thinking about the different factors that might create a hazard or risk. A critical benefit of this approach, said Leland, is that it greatly

enhanced workforce engagement and led to a mind shift in treating safety as a challenging technical problem requiring engineering and science skills rather than a compliance activity.

The principles of engineered safety are to

- Understand the technical basis of a system to understand how it can fail,
- Define unacceptable consequences to provide a framework for further work,
- Incorporate safety intentionally into a system design rather than grafting safety once a system is designed,
- Engage in a risk assessment approach to think carefully about what can go wrong and how it could happen,
- Identify and control energy sources that might produce an accident or safety failure, and
- Conduct ongoing positive verification to ensure that work can be performed safely and as intended.

Other key attributes, said Leland, are performing a formal hazard analysis at the system level that includes everything associated with an operation, recognizing that the worker is part of the system and typically the primary source of errors that might occur, and conducting life-cycle analysis to ensure that risks are managed effectively.

Leland said that before implementing the engineered safety program, SNL had a serious injury event approximately every 18 months. Since implementing this system in 2014, SNL has had no events that had unacceptable consequences, with less significant events evaluated and rolled into a hazard analysis to update system controls and provide lessons learned. Engagement of the workforce in technical problem solving, he added, has increased the cultural legitimacy of SNL's safety effort. What SNL is striving for, said Leland, is what he called unconscious competence, which is for safety behaviors, perspectives, and actions to be so engrained that staff would engage in them when distracted or in a moment of duress.

As an example of the engineered safety approach, Leland described an incident in which a technician put a gallium arsenide substrate into an oven calibrated for silicon, which caused the gallium substrate to melt and release toxic arsine gas. The technician realized the mistake and sounded the alarm, which prevented any detectable exposures. Applying the engineered safety approach led to the recognition that there were two cultures at the laboratory: an R&D culture that expects staff to exercise good, critical thinking and independent judgment from a safety perspective and allows staff more latitude in what they are doing, and a technician culture that expects staff to follow processes rigorously in a step-by-step manner. In this incident, the two cultures had been conflated. In addition, said Leland, safety in this instance was relying on administrative control—the technician was supposed to know where the gallium arsenide wafer could not go. After considering laboratory activities from the perspective of engineered safety, SNL discovered there were four materials for which it could not provide an adequate engineered control. As a result, SNL reengineered processes to eliminate those four input materials to prevent a similar dangerous situation from happening again.

Safety at the Department of Energy Office of Science

Juston Fontaine, DOE Office of Science, said the Office of Science stewards 10 of DOE's national laboratories, provides grants to nearly 30,000 researchers at more than 300 institutions, and supports some 38,000 users annually. Every national laboratory is a federally funded R&D center operated through management and operating contracts, which are partnerships between the Office of Science and the operating contractor. As colleagues, the contractors play an important role in establishing and implementing safety environments.

From Fontaine's perspective, a hybrid environment may exacerbate certain safety issues, but it is not altogether unique. For example, evaluating risk is important no matter the work environment, and it must be continuously reevaluated. This required adjustment in a hybrid environment to account for the fact that the right people may not be onsite to execute procedures safely and efficiently. The adjustment was to ensure a greater

supervisory presence when conducting certain types of work. In fact, for certain high-hazard work, the Office of Science determined that if the right people are not onsite, the work does not get done, regardless of how important it is.

Evaluating risk, said Fontaine, requires maintaining a healthy questioning attitude, which can wane because of complacency, resting on previous successes, or an overreliance on an expert-based system. One way to address this is to be one's own devil's advocate. In doing so, staff become more proactive rather than reactive and ask questions when everything is going great rather than when something goes wrong. The Office of Science has instituted peer review for operational advancement processes to evaluate and identify gaps, blind spots, and best practices for continuous improvement. The focus of this approach is less on internal controls and more on day-to-day operations.

Fontaine said that in addition to evaluating risk by questioning assumptions and processes to ensure a safe environment, it is important to strive to manage risk rather than be averse to it. This attitude requires avoiding treating every incident as a fatal flaw and recognizing the difference between a mistake and a violation. Mistakes happen, but the key is to mitigate against it and learn from the mistake. Violations, on the other hand, require accountability and consequences in certain occasions.

Leadership matters, said Fontaine, as does following an integrated stewardship model that strives to eliminate unnecessary and unhealthy stove piping of science and operations. Rather, risk analysis, communication, project planning, and execution need to be integrated so that the scientific and operational sides of the organization are on the same page and protect each other from tunnel vision. On a final note, Fontaine said to “ask another question,” because asking one more question can be the difference between a good day and a really bad day.

Safety in Infectious Disease Laboratories

Kevin Tuohey, Boston University, said the National Emerging Infectious Diseases Laboratories, which conducts research to investigate and understand

emerging pathogens and the diseases they cause, did not have the option of slowing its work during the pandemic. Given the organisms the laboratory works with, its risk mitigation efforts are extensive. Its culture of safety webpage addresses everything the laboratory is committed to doing, but there is no option to deviate from those commitments. The option that exists is to define different ways of accomplishing the same thing.

Once or twice per year, the Federal Select Agent Program, jointly managed by the Department of Health and Human Services and the Department of Agriculture, inspects the facility, reviewing all of its records, adherence to safety policies, and training activities. In addition, the City of Boston inspects the facility four times per year. Training, to Tuohey, includes developing, reviewing, and correcting standard operating procedures (SOPs), mentoring for new hires, in-person and online training, daily checklists, and space awareness. During the pandemic, online trainings grew to include 20 laboratory safety courses and 23 agent-specific trainings, with all online courses available to anyone at the university.

Tuohey said that the laboratory did not have many people working remotely during the pandemic, but it still had to cross-train people to ensure that the appropriate skillsets were always available onsite. Another change was transitioning SOP development and protocol review to online, where it has stayed because it proved to result in better attendance at meetings. In addition, because samples of SARS-CoV-2 were coming in regularly, monthly meetings to approve protocols and SOPs was insufficient. The online format allowed for doubling or tripling the number of meetings the review committees held.

One commitment the pandemic affected was to conduct training through drills and exercises, most of which were done previously with partners from the City of Boston, the Federal Bureau of Investigation, and the Commonwealth of Massachusetts. During the pandemic, assessing hazards and vulnerabilities that informed the drills became virtual. Today, he continued, the drills and exercises have evolved to take a hybrid approach, and corrective action plans go out electronically.

During the pandemic, Tuohey instituted a shared calendar and trained staff how to use it, which forced people to work as teams, coordinate work schedules, and share daily checklists for every critical system. Grand rounds and incident management have also moved to a virtual format, which the laboratory has retained, as did the personnel suitability review team, which increased its focus on supporting staff.

Tuohey said lessons learned included the realization that few people are prepared to communicate effectively with the public and that there is no such thing as over-communicating. Another lesson was that researchers tend to view complex issues through their lenses, not those of the public, making it important to understand and address the potential biases of the audience and sources and antecedents of mistrust, and to not dismiss community members who disagree. Credibility, said Tuohey, is critical, and it is important not to promise that there will never be an incident or conceal incidents that do occur. “We discovered early on that the more you educate people on what you are doing, the more you train people on how you are doing it, the fewer assumptions are developed on their own and the fewer issues because they know where they can turn to get the information,” said Tuohey.

Discussion

Extensive discussion reiterated the points the speakers made in their presentations, particularly the importance of having open channels of communication, having managers onsite, and the need for flexibility to adapt to changing circumstances. Fontaine noted that the pandemic reinvigorated detailed briefings for new employees that are not only meaningful but can also identify issues and ensure that everyone understands the landscape and what they are doing. The pandemic also had him reevaluating who needs to be either onsite or part of a specific action or approval for a research activity.

One lesson Leland learned was the importance of maintaining enough operational cadence to be able to continue to do things safely. SNL’s experience has been that safety risk goes up when an operation becomes

somewhat marginal. He also noted that SNL had to reengineer its evacuation procedures so that everyone in a building is trained and can insert themselves into whatever role is needed based on a few simple physical cues. A concern of Leland and Tuohey is that the hybrid work environment shifts safety tasks onto staff that are onsite, making it imperative to ensure that staff are not overburdened.

MENTORING IN A HYBRID ENVIRONMENT

A roundtable discussion moderated by Joan Bienvenue, The University of Texas at Austin, examined and discussed strategies for high-quality mentoring relationships in a remote/hybrid environment. Lisa Fain, Center for Mentoring Excellence, said her organization is fully virtual and has worked with organizations worldwide to create more inclusive cultures through mentoring, which she called a true leadership competency. Good mentoring takes intentionality, knowledge, practice, and reflection. Belle Rose Ragins, University of Wisconsin–Milwaukee, noted the important intersection of mentoring and diversity and the role of relational mentoring in creating high-quality mentoring relationships that would be most resilient to the challenges hybrid work creates. Kathy Kram, Boston University, said mentoring is not a single relationship, but a process that may involve more than one developmental relationship, each helping the mentee with some aspect of personal and professional development. She also believes that mentoring can thrive in a hybrid or even a fully remote environment with the effective use of technology.

When asked to define mentoring, Fain replied there are three important characteristics of the mentoring relationship: reciprocity, learning, and co-creation. Her organization states that mentoring is a reciprocal learning relationship in which mentor and mentee agree to a partnership where they work collaboratively toward achieving mutually defined goals that will develop a mentee’s skills, ability, knowledge, or thinking. The mentor, she noted, is not a teacher but rather a facilitator of learning for the mentee, and in facilitation, connection needs to come before content. Connection before

content is particularly important in a remote and hybrid environment.

Kram expanded the purpose of mentoring to include co-learning, which refers to both mentor and mentee learning from their relationship. Either may deepen their understanding of how to be effective in the workplace and, more broadly, how to be effective in life, given how the boundaries between work and family have become increasingly blurred. Mutual learning should also include cross-cultural issues. She added that the more breadth and depth invested in the mentoring relationship, the greater the potential for beneficial outcomes regarding both personal and professional development.

Regarding the learning aspect of mentoring, Ragins pointed to the holistic relational skills such as listening and perspective taking that develop and noted that both the mentor and mentee can apply to other contexts. She also highlighted the benefits of having multiple mentors that can each fill different needs and developing a network of relationships. High-quality mentoring, she said, moves beyond the hierarchical student-teacher model to one of mutual learning in which each partner in the mentoring relationship contributes knowledge without expecting anything in return.

Bienvenue asked the panelists if there are things lost in a virtual mentoring environment, particularly for newcomers in an organization. Kram said the idea that “one size does not fit all” applies to mentoring. Each setting needs to assess the newcomer’s experiences and design an approach to development that is responsive to that individual’s needs. She noted that there is little research comparing remote mentoring with in-person mentoring and added that peer mentoring and group mentoring are underutilized in most workplaces, although they might be more necessary given the constraints on remote and hybrid settings. Ragins said that research on remote mentoring, which consisted of sending emails and having occasional phone calls, was effective at providing knowledge, although not as effective as face-to-face mentoring.

With new employees, it is important to socialize them, which Ragins said is a different challenge from establishing mentoring relationships. Socialization, she said, is an informal process of information and knowledge sharing. What hybrid mentoring calls for is mindful mentoring, which requires thinking intentionally about what needs to occur in a particular situation and understanding expectations and the constraints of mentoring remotely. Fain remarked that what people need in any work setting, whether in person, hybrid, or remote, is a sense of belonging, and that requires connection. Mentoring, she said, is a great way of providing various touchpoints that foster connection and belonging.

Bienvenue asked the panelists for suggestions on how to develop connections when meetings are still largely online. To combat Zoom fatigue, Fain suggested having a “walk and talk” meeting, where mentor and mentee have a conversation while walking in their respective neighborhoods. Having multiple avenues for connection will enhance both in-person and Zoom meetings, she said. Ragins liked the walk and talk idea and suggested thinking about creative ways to use technology to form connections. One benefit of using Zoom, she said, is that when someone is talking, everyone is listening. Kram added that Zoom-based learning can work with good instructions and by creating small groups with norms around how to process the activity.

Ragins noted that she wondered at the beginning of the pandemic how she would teach diversity via Zoom only to find it is flourishing. Breaking people into small groups and having them share practices and be interactive is a positive that can contribute to some intimacy on Zoom that she did not expect. She suggested that when onboarding new employees via Zoom to engage in icebreakers and small group discussions.

When asked if it is possible to train someone on safety and instill a sense of an organization’s safety culture in the virtual environment, both Ragins and Fain pointed out that training, supervision, and oversight differ from mentoring. Given that, Kram said that peer mentoring could be a good venue for conveying information

about safety requirements. The key is giving the topic legitimacy by convening a group to develop a consensus around those requirements and determine which ones are more often violated or hard to maintain. Peer mentoring could involve a monthly meeting with staff members doing similar jobs who could discuss current challenges. The peer mentoring group could help an individual develop their own tailored strategy for maintaining safety norms in a particular environment.

Ragins commented that when addressing safety, an important concept is having people feel they have a voice so they can speak up when something goes awry. Mentoring helps give people voice and a sense of autonomy and empowerment, which can be critical with a diverse workforce.

Bienvenue asked the panelists to offer advice for those working virtually or in a hybrid setting who are seeking mentorship when there is no formal mentoring program in place, as well as for those individuals who want to be mentors. Fain said the first questions a person seeking a mentor should ask are not about who should be their mentors, but about what they want to learn, the characteristics they are looking for in a mentor, and what they need from a mentoring relationship. When contacting a potential mentor, the question to ask is not “will you be my mentor?” but rather, “I would like to learn about something that you have expertise in and can we have a conversation about that?” She added that existing relationships can be a good venue for having such mentoring moments that might then turn into longer-term mentoring relationships.

Kram agreed with Fain’s approach and added that another step for a mentee to take is to assess their current set of relationships and see if there are any individuals in their network who might be a good mentor. Professional organizations often have formal mentoring programs outside of work that mentees should explore. She also noted the importance of asking once per year if a mentor or mentors are still meeting the mentee’s needs.

Ragins introduced the idea of mentoring episodes, which are short-term developmental interactions in an informal relationship. Over time, with enough of these episodes, there can be a tipping point at which both parties recognize they have formed a mentoring relationship. She also cautioned against seeking the best performers to be mentors because they may not, in fact, be good mentors.

From an organizational perspective, mentoring takes time, and good mentors can be flooded with requests. Ragins said this is often true for non-dominant group members in an organization, whether that is based on gender, race, ethnicity, or sexual orientation. In general, people like to connect with people with whom they feel comfortable. For example, a woman of color might be inundated with requests from other women of color. At the same time, a White male might not feel comfortable mentoring a woman of color or a queer employee, and this is where diversity training is important in helping people realize that such barriers exist. Ragins said her research has found that women working in a laboratory setting felt uncomfortable contacting a male mentor because they were afraid the mentor or others would see that as a sexual advance.

However, Kram noted that a mentoring relationship can introduce the mentor from a dominant group to increase understanding of the issues that a member of a non-dominant group faces in the workplace and in life. In her experience, a powerful way to transcend some diversity issues is through learning conversations between mentors. The ability to be vulnerable is needed regarding issues of mentoring across differences. Fain said one challenge is overcoming the fallacy that one cannot mentor effectively without having all of the answers or sharing the same journey as their mentee. Instead, mentors need to have great questions to ask of their mentee and demonstrate curiosity and appreciative inquiry. She also recommended two books—*Athena Rising* and *Good Guys: How Men Can Be Better Allies for Women in the Workplace*, both by W. Brad Johnson et al.—for men in senior positions who are reluctant to mentor women.

In terms of recommending formal mentoring programs, Kram said it depends on the organizations because if there is not a learning culture or if there are strong discriminatory practices, a formal program might only replicate what is already harming the organization. Usually, she said, informal mentoring over time is more likely to be of high quality than mentoring engineered by a formal program, depending on the organization's culture.

Fain said it is not an either/or situation, and she noted the following two specific benefits to a formal mentoring program: (1) increased access for traditionally underrepresented individuals and (2) the availability of metrics for recruiting, retention, and promotion of traditionally underrepresented individuals and for improvement activities. Ragins added that the quality of the mentoring relationship matters more than the type of relationship.

Regarding how to develop a good formal mentoring program, Ragins said it is important to select mentors who are there for the right reasons (not to merely check a box) and to conduct orientation and training for the selected mentors. Kram said it is important for mentees to have a choice of mentors rather than being assigned one.

When asked to discuss challenges to remote mentoring, Kram mentioned the lack of spontaneity, and Fain

noted the importance of being transparent and setting norms for mentoring conversations. Having grace with one another is also important because sometimes “technology fails.” Ragins said one of the biggest challenges is building trust, and part of building trust is for both mentors and mentees to be vulnerable and authentic. Another challenge for virtual mentoring, Ragins continued, is providing performance-related feedback. Bienvenue added that she makes a point of telling a mentee a horrific story about when she did something stupid to convey that it is okay to make mistakes and learn from them.

CLOSING REMARKS

Elizabeth Mackey, NIST, noted that a common element throughout the workshop was the human element, which points to the importance of ensuring communications are part of any strategy for change. She noted that it is still unclear how to develop relationships among staff, their mentors, and their supervisors while ensuring that experiential training still occurs. Another common element she noticed was culture and having safety and mentoring be integral parts of organizational culture. The clear message from the workshop is that hybrid work arrangements are here to stay, Mackey said, as it is the overwhelming preference of employees. While they value flexibility, they also want relationships. They want mentoring—they want to run into their supervisors and leaders, and they want engagement. Balancing these two desires is the challenge.

WORKSHOP PLANNING COMMITTEE MEMBERS **Carol Burns** (Co-Chair), Lawrence Berkeley National Laboratory; **Gerald Keusch** (Co-Chair), Boston University; **Joanne Andreadis**, Centers for Disease Control and Prevention; **Sandra Begay**, Sandia National Laboratories; **Joan Bienvenue**, The University of Texas System; **Mary Czerwinski**, Microsoft Research; **Deborah O'Neil**, Bowling Green State University; and **Cort Rudolph**, Wayne State University.

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REVIEWERS To ensure that it meets institutional standards for quality and objectivity, this Proceedings of a Workshop—in Brief was reviewed by **James Bagian**, University of Michigan; **Charles Norton**, Jet Propulsion Laboratory; **Brittany Segundo**, National Academies of Sciences, Engineering, and Medicine; and **Kaci Vandalen**, National Institute of Allergy and Infectious Diseases. **Katiria Ortiz**, National Academies of Sciences, Engineering, and Medicine, served as the review coordinator.

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For additional information regarding the workshop, visit https://www.nationalacademies.org/event/40258_08-2023_workplace-safety-in-a-hybrid-federal-laboratories-a-workshop.

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