



Lessons Learned & Success Stories – January to March 2023

The NBACC Mishaps, Lessons Learned and Success Stories Summary serves to reinforce a strong culture of safety and accountability by promoting consistent reporting of mishaps, establishing strong lines of communication with the safety department, supporting a learning environment by allowing others to learn from reported events, and tangibly demonstrating NBACC Leadership's commitment to safety, accident prevention, and continuous improvement.

LESSONS LEARNED:

1. This month several events occurred which could have been dismissed and not reported because they appeared to be quite minor; however, our staff continues to do the right thing. If you see something on the floor in a laboratory, you should always report the incident to Health and Safety, even if it seems benign.
2. Punxsutawney Phil saw his shadow, and we all know what that means – six more weeks of winter (or whatever random season Maryland likes to throw at us)! Although the weather recently has given us a taste of the Spring to come, we should still be mindful of the possibility for snow, ice, floods, and high winds. Staying safe means being informed by keeping an eye on the weather reports. Keep an umbrella in your car or office for those surprise late-afternoon showers when you're heading home for the day. If overnight temperatures drop, be aware that roads the next morning may be a bit slippery so give yourself extra time. Stay safe out there, NBACC!
3. General workplace awareness is essential to maintaining a safe and productive laboratory and work environment. Mitigation of safety and facilities events can happen anywhere in the building, from your desk and office hallways to the BSC and chemical showers. As the energy and stress levels rise to complete tasks for the end of the performance year reporting, it is important that everyone maintains a safe and activity appropriate work pace and attention to procedures, so that events can be mitigated or prevented, and appropriate actions taken in response to an unanticipated occurrence.

SUCCESS STORIES

1. A staff member created a closed system for the collection of acetonitrile (ACN) waste from a nucleic acid synthesizer. The manufacturer provided neither a way to containerize the waste nor a way to ensure that the vapors could escape from the waste process safely. The staff member located and utilized several different parts and items including glass waste containers, Leuer locks, capillary tubes, and carbon filters to create their own completely closed waste system. To address potential exposures to vapors, their design included a small carbon filter that completely traps the vapors from escaping into the laboratory. The new closed system also allows researchers to safely collect non-infectious chemical waste outside of a chemical fume hood (CFH) and therefore reduces the footprint in the CFH. This closed system is a significant improvement in our ability to safely capture

ACN waste from this synthesizer and is a good example of a staff member getting creative and innovative to reduce exposures to hazardous and flammable chemicals.

EVENT SUMMARIES:

1. **FIRST AID SUMMARY (CUTS):** In all the following incidents, personnel reported to the Competent Medical Authority (CMA), first aid was applied as necessary, and laboratory restrictions were placed if needed.
 - 12/02/2022; A staff member attending an off-site welding class sustained burns to their left hand, wrist, and right knuckle when slag fell down into their glove.
 - 12/08/2022; A staff member cut their right hand when they were placing a bottle under a laboratory sink and hit a support bracket.
 - 01/12/2023; A staff member in an administrative area was reaching into the bottom shelf of a filing cabinet when they scraped their right thumb against a metal bracket in the front of the drawer.
 - 01/13/2023; A staff member walking in an interstitial area was looking overhead to locate a valve when they scraped their right arm on a strut.
 - 01/18/2023; A staff member working in an interstitial space was running an extension cord over a conduit overhead when the extension cord fell and hit them in the head causing a small cut.
 - 02/02/2023; A staff member was showering out of the BSL-3 when they noticed a small scratch on their right thumb. The staff member did not notice the scratch before showering out of the suite but confirmed that there were no glove breaches or spills during their work.
 - 02/15/2023; A staff member was pulling a cart through an administrative area when they scraped their heel on the bottom portion of the cart.
 - 02/24/2023; A staff member scraped their finger on the zipper of their BSL-4 suit when donning it in the suit room.

NEAR MISS SUMMARIES:

2. **SPILL SUMMARY:** 12/02/2022; A staff member working in the BSC of a BSL-2 laboratory was thawing flasks of agent when one stack of flasks, which were sealed in a zip-top bag, moved a few inches onto the grille of the BSC, resulting in the bag partially hanging out of the BSC. The agent being used has an unassigned Risk Group (RG) classification but is handled according to protocols for RG 2 agents. Though no liquid spilled from the flasks and the flasks remained in the sealed zip-top bag, agent had been worked with in the BSC earlier in the employee's work and the BSC had yet to be surface disinfected. The staff member immediately held their breath and exited the room to call Health & Safety. There were no other spills in the duration of the staff member's work and the BSC was functioning normally the entire time as well. After waiting 30 minutes, the staff member was permitted to re-enter the room to move the flask fully into the BSC and appropriately disinfect the grille of the BSC. The CMA ruled no potential exposure.
3. **PPE FAILURE SUMMARY:** 12/04/2022; A staff member that had been working in the BSL-4 suite noted that upon exiting the chemical shower, the knee of their scrub became wet. The staff member had been taking notes in the suite and had not been working with agent. During an inspection of the suit (#294), a small hole was discovered near the pull tab of the suit zipper. There were no spills of agent during their time in the BSL-4. A new suit was provided to the staff member and the old suit was retired. The CMA ruled no potential exposure.
4. **EQUIPMENT FAILURE SUMMARY:** 12/21/2022; A subcontractor was preparing a centrifuge for a

VHP decontamination when, upon pulling the plug from the outlet, they heard a pop and witnessed a puff of smoke come from the outlet. The instrument was plugged into a single outlet that had no other connections and the circuit breaker was not tripped. A member of FMO inspected the outlet, checked the connections, and confirmed that it was not damaged and was functioning properly. Upon successful completion of the VHP decon, the plug on the centrifuge will be inspected outside of containment.

5. **PPE FAILURE SUMMARY:** 12/23/2022; A staff member working in the BSC of a BSL-3 laboratory noticed a tear in the finger of one of their inner gloves after discarding their outer gloves. Since their outer gloves had already been discarded, the staff member was unable to perform a leak test; however, they noted that the outer gloves visually appeared to be intact. Though they had been working with an RG 2 agent, they confirmed with Health and Safety that there were no spills during their work and that their skin remained intact. Upon noticing the tear, the staff member discarded their gloves, washed their hands, and donned a fresh pair. The CMA ruled no potential exposure.
6. **PPE FAILURE SUMMARY:** 01/26/2022; A staff member that had been working in the BSL-4 suite reported that while in the chemical shower their left sock became wet. The staff member had been wearing a BSL-4 suit with integrated booties and upon exiting the chemical shower noticed a small hole in the seam of the toe. The staff member noted that the suit passed its initial pressure decay test prior to donning that morning. While in the suite, the staff member was taking notes and was not working with an agent though they were in an ABSL-4 laboratory during the care and feeding of animals exposed to a Risk Group (RG) 4 agent. There were no spills of agent during their time in the BSL-4. A new suit was provided to the staff member and the old suit was retired. The CMA ruled no potential exposure.
7. **SPILL SUMMARY:** 02/16/2023; A staff member working in the BSC of a BSL-3 laboratory was ejecting a pipette tip into a decon pan when the tip exited the pan and landed on the surface of the BSC. Prior to the incident, the staff member had aspirated bleach into the tip after working with a Risk Group (RG) 3 agent. The staff member reported the spill to Health and Safety, used a bleach wipe to transfer the pipette tip back to the kill pan, and surface decontaminated the BSC.
8. **SPILL SUMMARY:** 02/22/2023; A staff member working in the BSC of a BSL-3 laboratory was preparing tubes with a RG 3 agent for flow cytometry. Prior to opening the tubes containing agent, focusing fluid must be added to an empty tube. While adding the fluid to the individual tubes, the staff member placed the source container of focusing fluid to the side. After the tubes containing agent were secured/closed but prior to deconning the BSC, the staff member's elbow bumped the empty bottle of focusing fluid and caused it to fall to the floor. The staff member held their breath, discarded their outer PPE, and left the room. After speaking to a member of Health and Safety, the staff member was permitted to re-enter the room to clean the spill according to the spill cleanup SOP. The CMA ruled no potential exposure.

OTHER OCCURENCES:

1. **REPORTED EVENTS:** In all of the following, personnel reported the events to Health and Safety, and they were tracked for trending purposes.
 - A staff member was working in a BSL-2 laboratory when they accidentally started a centrifuge without securing the lid to the rotor. When the spin began to stop, the braking caused the centrifuge to go out of balance. The unit was placed out of service until it was

- confirmed that unit was still operational.
- A staff member working in a BSL-3 laboratory reported an outer glove tear. The cause of the tear is unknown. The staff member noticed the tear while plating in the BSC.
 - A staff member training with water in a BSL-2 laboratory reported that a closed tube fell out of the BSC while they were working. The staff member held their breath, left the room, and called Health and Safety. After reporting the incident, the staff member was permitted to return the tube to the BSC and wipe the area of the floor where it landed.
 - A staff member reported that while working in a BSL-3 laboratory with another staff member, their colleague's PAPR power button contacted the back of a chair and caused the unit to shut off. The staff member immediately signaled to their colleague, who had also noticed what happened. While the individual held their breath, the other staff member pushed the power button to turn the PAPR back on. The staff member was not working with infectious agent at the time of the incident.
 - A staff member reported that their PAPR shut off unexpectedly while setting up in the BSC. The staff member held their breath and exited to the write-up area. The PAPR unit was placed out of service for evaluation.
 - A staff member entered a BSL-3 suite and reported that a ducted BSC in one of the laboratories was giving an exhaust error alarm. The staff member reset the alarm by powering the BSC off and on again. There was no agent present, and no work was being done in the BSC at the time of the alarm.
 - A staff member reported that an autoclave spilled condensate on to the cold side of the hallway after sitting overnight at the completion of its cycle. The staff member that started the autoclave cycle expected the run to be completed and the contents to be removed before the end of the day.
 - Upon entering a BSL-3 suite, a staff member noticed that the door to a laboratory was cracked open and the room was pulling extremely negative. The ducted BSC in the room was also in alarm. The staff member reported the incident to the on-call Health and Safety member and after confirming that there was no agent out in the room, entered the room to reset the BSC and then closed the door.
 - A staff member in the BSL-4 was filling a bucket with MicroChem in the hallway prior to starting their work in the suite, when they noticed that their bucket had a hole and was leaking MicroChem on the floor. The staff member emptied the bucket and reported the incident to the Control Room Operator who called Health and Safety. The staff member cleaned the MicroChem from the floor, discarded the damaged bucket and retrieved a new one to use.
 - A staff member working in a BSL-3 laboratory was conducting a pre-work decontamination of a BSC when their PAPR beeped three times and then shut off. The staff member held their breath, left the room, and returned to the suite's PAPR staging area. Once in the PAPR staging area, the staff member called Health and Safety to report the incident. They also shared that the unit felt warm to the touch, something they had not noticed in the past. The staff member was instructed to mark the unit 'out of service' and wear a different PAPR in the suite. The next day a member of Health and Safety entered the suite, evaluated the malfunctioning PAPR and prepared it to be decontaminated out of the suite and discarded.
 - A staff member was exiting the BSL-4 chemical shower when they noticed that the chest area of their scrubs was wet. The staff reported that there were no spills during their time working in the suite. The suit was placed out of service and will be evaluated by a member of Health and Safety.
 - A staff member reported a very small amount of clear, sticky material on the floor and tacky mat of a BSL-2 laboratory. The material was inert and did not react to pH paper. There was

- no odor of organics and no infectious material had been worked with in the laboratory. After consultation with Health and Safety, the floor was cleaned with a bleach solution.
- A staff member reported that their PAPR battery fell out from the motor while working in a BSL-3 laboratory. The individual was not working with agent at the time of the incident. During their discussion with Health and Safety, the staff member was unsure if the battery had clicked into place but noted that they had been moving in a chair prior to the battery detaching from the unit. They believed that it may have come dislodged during previous activities in the suite. They reconnected the battery and continued their work.
 - A staff member reported an outer glove tear while performing a post-work decontamination of the BSC in a BSL-3 laboratory. Their glove was snagged on the edge of a tip box. The staff member performed a leak test of their inner gloves, which were confirmed to be intact. They washed their hands and donned a new pair of gloves.
 - During a walk-through of the BSL-4 suite, two laboratorians entered a laboratory and observed a labeled but empty O-ring casketed cryo-vial (1.5 mL) on the floor. The vial was both closed and appeared to be unused. After contacting Health and Safety via the control room operator, the floor was decontaminated out of an abundance of caution and the vial was placed in a secondary container for the project team to inspect. The two laboratorians suspected that the tube had been pre-labeled for the current project taking place in the room and was dropped during an attempt to discard it. The staff members reported no issues with their suits during the time in the suite and later confirmed with project members that the vial was unused.

Note: It should be assumed that staff are wearing a PAPR (minimum APF 25) in events taking place in the BSL-3 laboratories unless otherwise stated.

Document Definitions:

Event Summaries – Any OSHA recordable mishap or first aid injury or illness.

Near Miss Summaries – Any mishap that requires a potential exposure ruling from the Competent Medical Authority (CMA), represented a CDC Form 3 submission, or a potentially serious accident or incident that could have resulted in personal injury, illness, death, and damage to property or the environment, but did not occur due to one or more factors.

Other Occurrences – Mishaps that do not fit into the other two categories.

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All research was conducted in compliance with the Animal Welfare Act and other federal statutes and regulations relating to animals and experiments involving animals and adheres to principles stated in the Guide for the Care and Use of Laboratory Animals, and approved by both the NBACC Institutional Animal Care and Use Committee and, when applicable, the DHS Compliance and Assurance Program Office. The facility where this research was conducted is fully accredited by AAALAC International and maintains a Public Health Service (PHS) Humane Care and Use of Laboratory Animals (Policy) assurance.