

Lessons Learned & Success Stories – July to September 2022



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. NBACC staff have always had a very strong reporting culture. When we report mishaps and near misses it gives us an opportunity to not only improve processes, but also to sometimes improve supplies and/or equipment we need to do our work safely. This month the simple act of reporting a minor spill allowed us to see that a particular type of glove was not performing as well as others. This information was discussed by the Institutional Safety Committee (ISC) and shared with the Environmental Operations Manager. Sharing feedback on performance of materials used in your work helps us to supply you with the best performing products. Your Laboratory Space Managers (LSM), Health and Safety, ISC members, and Environment Operations Staff are all good options for reporting how PPE and other common lab supplies are performing.
2. When escorting subcontractors in the building, it is essential that escorts adhere to all NBACC SOPs and clearly define what the subcontractor can and cannot do, particularly when entering a laboratory or a space with access to containment (e.g., change room). The NBACC escort is responsible for safe and secure operations and adherence to all relevant safety and security SOPs associated with the performance of activities by a subcontractor. Even if a subcontractor has been to NBACC numerous times, the escort should make sure these individuals are working within the confines of the SOPs as many are frequently updated.
3. With great ability comes great accountability. – Jefferson Davis, ‘Spider-Man: Into the Spider-Verse’ Our day-to-day operations at the NBACC can find us reviewing SOPs one minute, guiding new employees to a successful start the next, and even rushing into the lab for incoming casework or to ensure that our Nation is kept safe. Big or small, we are held accountable as we demonstrate these great abilities. We are always looked at and looked up to. Through our constant attentiveness and perseverance, we must always show our ability to be NBACC responsible.

SUCCESS STORIES

1. NBACC Environmental Operations (EO) processes all the waste for the building. This means that EO staff routinely handle large bags of medical and perceived medical waste (i.e., “red bag” waste), universal waste (e.g., fluorescent lights, batteries), trash (including cardboard, paper, odd-shaped objects, food waste, etc.), and waste that is autoclaved out of the BSL-2, -3, and -4 laboratories.

Although all sharp objects (broken glass, needles, and other objects that can pierce skin) are required to be placed into sharps containers, handling waste bags is strenuous, manual labor that is often the cause of hand injuries. Last month an EO staff member took it upon themselves to evaluate a new type of glove for waste handling. This glove offers improved cut protection, grip, and abrasion resistance compared to gloves currently used by EO staff. After consulting with Health and Safety, and after testing the new gloves with other EO staff, the gloves were approved for procurement and use throughout the building. Using gloves that protect the hands from abrasions, contact with hard objects, and crushing injuries is a good way of preventing hand injuries at work.

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.
 - 06/03/2022; A staff member sustained a burn when they were removing biohazard waste from an autoclave, and their right arm contacted the metal frame of the autoclave cart.
 - 06/14/2022; A staff member was reaching for an item in a refrigerator in a BSL-3 laboratory when they scraped their left knuckle on the track of the sliding door.
 - 07/06/2022; A staff member scraped their left forearm while setting up a VHP decontamination of a glovebox.
 - 07/11/2022; A staff member developed a headache, severe joint pain, and fatigue after receiving the first dose of a two-dose vaccine series.
 - 07/12/2022; A staff member sustained a cut when they were entering the ECP when the door struck their foot.
 - 07/14/2022; A staff member developed severe body aches, fatigue, and swelling in their left arm after receiving a booster dose of a vaccine.
 - 07/14/2022; A staff member sustained a scrape to their right wrist when the door to the chemical storage room closed behind them.
 - 08/05/2022; A staff member reported to the CMA with back pain after standing for prolonged periods during work in containment.
 - 08/11/2022; A staff member was walking through an autoclave utility closet when they scraped their right thumb along the edge of the door frame. The door frame was evaluated by a member of Health and Safety and not found to be intrinsically sharp. It is likely that the injury was due to force and not a sharp edge.

NEAR MISS SUMMARIES:

1. **SPILL SUMMARY:** 06/08/2022; A staff member was working in the Biological Safety Cabinet (BSC) of a BSL-3 laboratory when they accidentally dispensed 1-5 µl of a Risk Group (RG) 3 agent onto the lid of a plate, believing that they had already removed the lid. Upon noticing the liquid on the lid, the staff member immediately disposed of the pipette tip and decontaminated the lid, making sure to allow a full contact time. After reporting and discussing the incident with a member of Health and Safety, the staff member was encouraged to make a small mark on the lid of the plates to help identify the lid. The addition of a small mark would not interfere with counting but may prevent forgetting to lift the lid of the plate.

2. **SPILL SUMMARY:** 06/13/2022; A staff member working in the BSC of a BSL-3 laboratory was manipulating an uncapped tube of an attenuated agent when the tube slipped from their hands and spilled its contents onto the surface of the BSC. The staff member immediately covered the spill with a bleach towelette and changed their gloves. While changing gloves, one of the staff member's outer gloves ripped, though their inner gloves remained intact. After cleaning the spill, the staff member contacted a member of Health and Safety. As they were reporting the event, the staff member noted that the brand of gloves they were wearing felt overly slippery. This was the first report of a problem with this brand of gloves, but Health and Safety will continue to track and investigate whether these gloves are contributing to spills and other incidents.
3. **PROCEDURAL ERROR SUMMARY:** 07/07/2022; A subcontractor who was on-site to service a piece of equipment in a BSL-2 laboratory mistakenly crossed the line of containment in the change room. After changing into scrubs, the subcontractor noticed that all the laboratory shoes on the clean side were labeled with initials and therefore appeared to be unavailable. They decided to check the other rack of laboratory shoes, which were stored on the dirty side of the change room. Their NBACC escort, who was not in the change room with them, opened the change room door to check on them and noticed that they were across the line. The subcontractor was instructed to remove their garments and shower for three full minutes making sure to use soap and shampoo. Once across the line of containment, the individual donned scrubs, socks, and shoes and proceeded to their work in the BSL-2 laboratory.
4. **PROCEDURAL ERROR SUMMARY:** 07/20/2022; A staff member working in a BSL-3 laboratory was preparing to transfer a bag containing conical tubes of a RG 3 agent to another laboratory when they grabbed the decontaminated bag in the BSC with their bare hand. The staff member carried the bag to the other lab and placed it into another BSC. Recognizing their mistake, they washed their hands and called Health and Safety. The staff confirmed that their skin was intact. The CMA ruled no potential exposure.
5. **PPE FAILURE SUMMARY:** 07/20/2022; A staff member working in a BSL-3 laboratory was writing down data from an instrument when they noticed a small tear in the right thumb of their glove. Though the staff member was writing notes outside of the BSC, they had been wearing the glove previously while working in the BSC. The staff member had already discarded their outer gloves before they noticed the tear on their inner glove, so they were unable perform a leak test. Prior to noticing the tear, the staff member had used forceps to load cuvettes containing a RG 3 agent. They reported the tear to a member of Health and Safety and confirmed that there were no spills during their work and their skin remained intact. The staff member washed their hands and donned a new set of gloves. The CMA ruled no potential exposure.
6. **PPE FAILURE SUMMARY:** 07/20/2022; A staff member reported that their left wrist/arm became wet while in the chemical shower as they exited the BSL-4 suite. Once they were in the suit room, the individual performed a leak test, which included spraying the suit with a soapy solution to detect leaks. During the test, the staff member noticed that the suit was leaking air through the tape seams on both gloves even though only their left arm became wet from the chemical shower. There were no pinholes or other issues noted with the suit, and it passed an initial pressure decay test before being worn into the suite. The staff member only entered the suite to perform chores. There was no agent present, and no other issues with their PPE during their time in the suite.

7. **PROCEDURAL FAILURE SUMMARY:** 08/05/2022; A staff member working in a BSL-3 suite opened the door of an autoclave and discovered that waste containing BSAT had been placed inside the autoclave, but the cycle had not been initiated. The incident was immediately reported to Health and Safety and the Responsible Official. Upon further investigation, it was discovered that the staff member had loaded the autoclave 3 days prior and believed that they had started the cycle. The waste was discovered in the late afternoon but due to a planned steam outage, it was autoclaved out of the suite the next business day.

8. **PROCEDURAL FAILURE SUMMARY:** 08/08/2022; When replacing the hydrophobic filters for the NBACC laboratory vent skids, it was discovered that two of the filter housings did not have filters present. New filters were immediately installed and certified and the RO and Health and Safety were promptly notified. During the investigation it was determined that the two filter housings had both passed annual certification each year they were tested. It has been concluded the design and testing method of the older certification machine failed to detect missing filters. As a result of this incident several corrective and administrative actions were made, including using newer model certification machines with improved testing methods capable of detecting missing filters. Given NBACC's practice to inactivate all agents prior to introduction to the plumbing system or Effluent Decontamination System, risk to personnel or the environment was mitigated.

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 forgot to remove their ring and earrings before entering containment. The jewelry was removed and bleached out of the suite.
 - A staff member reported that a vendor they were escorting into an ABSL-2 space sustained a small cut on their finger while installing a new laboratory instrument. The visitor washed their hands, and an evaluation by the CMAs was offered. The visitor declined and opted to apply their own first aid. There was no agent present at the time of the incident.
 - A staff member unloading an autoclave noted that one of the biohazard waste bags had not been put into a secondary container. The autoclave run was successful, and the bag remained intact. The LSM of the space was notified.
 - A staff member training in a BSL-4 laboratory was wiping down a decon pan in the BSC, and a small amount of disinfectant detergent spilled out of the pan. Though the staff member was using dye and water for training purposes, they contacted Health and Safety, and the spill was cleaned following proper spill procedures.
 - A staff member in training in a BSL-4 laboratory was trying to install tips onto a multi-channel pipette when the box of tips flipped over, and some of the tips spilled outside of the BSC. Though the staff member had only been training with dye and water, they contacted Health and Safety and cleaned the spill following proper spill procedures.
 - A staff member was performing a post-work decontamination in a hard-ducted BSC when the BSC went into exhaust error alarm. The staff member exited the room and contacted Health and Safety. The staff member was permitted to re-enter the room, clear the alarm, and complete their surface decontamination of the BSC.
 - A staff member accidentally carried a cloth lanyard with keys across the line of containment and into the dirty side of the change room. The lanyard was discarded, and the keys were surface decontaminated with bleach.

- A subcontractor wore a necklace and ring into containment. Their NBACC escort bleached the jewelry out of containment.
- A staff member was unpacking a box in the BSC when they noticed a tear in their outer gloves. The staff member immediately discarded the gloves and performed a leak test on their inner gloves. The test confirmed that their inner gloves remained intact.
- Two staff members were taking notes in a BSL-3 laboratory when the nearby hard-ducted BSC in the went into an exhaust error alarm. The staff members exited the room and contacted Health and Safety. They were permitted to re-enter the room, clear the alarm, and complete their surface decontamination of the BSC.
- A staff member working in a BSL-0 laboratory reported that roughly 0.5 mL of a chemical solution leaked from a cartridge in a lab instrument. There was no agent present at the time of the leak, which was determined to be the result of an instrument failure. Both staff members exited the room to call Health and Safety. The spill was cleaned up appropriately and the instrument was bagged and transported to a chemical fume hood in another laboratory, where the cartridge could be removed from the instrument. The instrument was marked out of service and is pending evaluation by a service technician.
- A staff member working in a BSL-3 laboratory was moving a rotor from the BSC to the centrifuge when they noticed a tear in their gloves. It is unknown when the tear occurred, but the staff member believes it happened once they'd moved their hands out of the BSC since they did not see the tear while removing their outer gloves in the BSC. The staff member washed their hands, donned a new pair of gloves, and confirmed that the discarded outer gloves had remained intact.
- A staff member working in a BSL-2 laboratory was aliquoting regents in the BSC when they noticed a tear in the index finger of their right glove. The staff member was not working with agent at the time, so they were only wearing one pair of gloves. The staff member discarded their gloves, washed their hands, and called Health and Safety. They confirmed that their skin remained intact and were permitted to continue their work. The staff member noted that the brand of gloves frequently led to glove tears. Health and Safety is investigating whether the frequent incidence of glove tears can be attributed to this brand.
- A staff member was preparing to place items in the BSC of a BSL-3 laboratory when they turned on the cabinet light and the unit's display showed that the blower was off. The staff member left the room and called Health and Safety. During the investigation of the incident, the staff member relayed that the BSC had been used earlier that morning by a different staff member who had filled out the BSC usage log and indicated there were no issues with the BSC or blower. The BSC had been decontaminated after that staff member used it and had not been used in the 5+ hours since. When the staff member who had used the BSC in the morning was contacted, they confirmed there were no issues with the BSC during their work. To not disrupt the staff member's planned work, they were allowed to reenter the room, turn on the blower and continue their work. After the staff member completed their work, they marked the BSC temporarily 'out of service' so that the unit could run and possibly recreate any blower issues. The next morning, another staff member confirmed that the blower had maintained operation and was permitted to use the unit. The root cause of this issue is unknown. While it is possible that the morning staff member could have accidentally hit the 'blower' button when turning off the BSC light, it is purely speculative. It is also possible that there is an issue with the unit and the blower simply shut off. Until the issue can be recreated, Facilities is limited on what they can do to evaluate the unit for blower issues. There have been no other issues reported for this BSC.
- A staff member observed a quarter sized drop of brown viscous liquid on the floor when doing chores in a BSL-3 laboratory. Due to the unknown nature of the liquid, the staff

member exited the room and called Health and Safety. The LSM was contacted and after speaking with Health and Safety, they entered the laboratory and cleaned the spill. This incident is still under investigation. The laboratory had not been used in more than two weeks. The placement and characteristics of the drop are not consistent with any chemicals stored in the laboratory or leaking equipment. The drop is believed to be oil/grease for a laboratory chair.

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.

Success Story - A successful process improvement or response to an event that went above or beyond normal operations, where an injury was prevented, or the improvement had a positive effect on a program, project, or activity.

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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.