



Lessons Learned & Success Stories – June to August 2019 Report

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.

SUCCESS STORIES:

1. The Biosafety Level (BSL)-4 Laboratory Space Managers (LSM) conducted the 2nd annual, live action drills in the decontaminated side of the BSL-4. In an effort to reinforce BSL-4 training, staff members that work in the BSL-4 were guided through scenarios that involved suit breaches and emergency evacuations. Staff were also tasked with managing the control room during the simulated emergencies to review the responsibilities of the control room operator during such events. Not only did the drills provide staff with an opportunity to experience an emergent situation in a controlled environment, it also allowed the LSMs to spot gaps in the Standard Operating Procedures (SOPs) and emergency protocols. Feedback from staff was positive, and while these scenarios are not as likely to occur, these emergency drills give us an opportunity to continuously improve our emergency preparedness and increase the chances of successful outcomes during real emergencies.
2. A staff member was preparing to enter a non-laboratory space when they realized that they had not entered that space in months and were not sure of the entry procedures. The staff member had unescorted access to the space but called another lab member to confirm the entry requirements. Instead of just communicating how to enter the space, that staff member met their colleague and walked them through the process. Once they had entered the space, they noticed that the first staff member was unable to badge out of it, despite having access to enter. The second staff member was able to badge them both out of the space. There are numerous positive outcomes to highlight from this success story.
 - The original staff member, despite having access to the space, recognized that they were unsure of how to access the space and called for confirmation.
 - The second staff member went above and beyond and walked their colleague through the entry process instead of just telling them over the phone.
 - Together, both staff members identified a discrepancy between the entry and exit badge readers. That discrepancy had the potential to trap other staff members in that area and presented an emergency egress hazard.

The NBACC Operations Manager is working with Security to fix the disconnect between the badge readers, but this event shows that even something as small as asking a question or helping a colleague can have a big impact on making NBACC a safer space for all staff.

3. A group ordered a new piece of equipment. Upon receipt of the equipment, the person taking it into the lab decided to open the packages outside of the lab space to ensure that everything was there and fit properly. Upon inspection, it was discovered that a glass piece had a small fissure in it. The equipment is a sonicator so sending ultrasonic waves into a piece of glass that has a small, internal crack could have caused it to shatter. Since it was going into a containment space (BSL-3), it could have caused even greater issues. Acquisitions got in touch with the company who was able to overnight a replacement piece that did not have any cracks. Thankfully the equipment was inspected thoroughly prior to use.

LESSONS LEARNED:

1. Although Personal Protective Equipment (PPE) is intended to serve as protection for the user, in some instances it may become a hindrance. This was evident in one of the summaries from this report when a contributing factor to an incident was a glove that caught on the lid of a stack of plates. Always make sure you are aware of your surroundings, hand placement and movements. If a spill does occur, remember to call the Command Center and follow spill procedures.
2. Documentation is critical for many processes at NBACC. We all know that Bio Safety Cabinet (BSC) and performance check forms must be filled out, calibrations verified etc. A procedural failure in one of the summaries from this report highlights the importance of proper documentation. The use of the BSL-4 calendar allowed for staff to quickly obtain information that was needed. While not all labs use a calendar for documentation, it is important to have an awareness of events that are occurring in the areas where you work.
3. Below are some lessons staff can learn from events and successes that occurred during the month of June.
 - **Inspect equipment before using.** Staff potentially avoided a more serious issue by inspecting and noticing that new equipment had a defect before moving it into containment.
 - **Be observant of your surroundings and slow down.** Minor cuts and scrapes can occur even when performing the simplest of tasks.
 - **Be aware of your workspace.** It is common to “bump” things in containment. Sometime those situations are unavoidable, but being aware of your workspace and following some good laboratory practices, like decluttering your work area, can reduce the chance of bumps resulting in spills or other issues.
 - **Read and understand documents.** NBACC can at times be overburdening with paperwork and signs, but many of these documents contain critical information on how to safely do something. It is important to remember that if you are unsure of any process it is best to stop and request assistance or clarification before proceeding.

Attention to detail and being observant of your surroundings is vital for preventing larger safety issues.

EVENT SUMMARIES:

1. **FIRST AID SUMMARY:** 05/13/19; A staff member was walking out of a bathroom when their shoe caught the bottom of their pant leg and they fell, hitting their face on the ground. Another staff member saw the injured employee and, while assisting the employee, instructed another staff member to have the Command Center call 911 and notify Health and Safety. The Competent Medical Authority (CMA) arrived to evaluate the staff member and gather information for the

emergency responders. Once the ambulance arrived, they took the staff member to the hospital to further assess their injuries. The employee returned to work after recovery.

2. **FIRST AID SUMMARY (CUTS):** In all the following incidents, personnel reported to the CMA, first aid was applied as necessary, and laboratory restrictions were placed if needed.
 - 06/04/2019; A staff member working in a BSL-3 laboratory was conducting preventative maintenance on components outside of a Class III BSC when they pricked their right hand on a sharp piece of metal that was protruding from a USB port located on the outside of the BSC. Their glove did not appear to be compromised, but a small drop of blood appeared under their glove and they immediately washed their hands and called the Command Center. As a follow-up to this event, the LSM had all USB ports with sharp pieces removed from the Class III BSC and they also reminded staff members of the location of work gloves within the laboratory.
 - 06/20/19; A staff member in a non-containment hallway was tapping dust out of an autoclave tray when they scraped the edge of their right thumb. They washed their hands and immediately reported to the CMA.
 - 07/01/2019; A staff member in the lobby was placing their cellphone in a locker when they cut their finger on the locking mechanism.
 - 07/11/2019; A staff member working in the loading dock was drilling a hole in the wall when part of the drill chuck rubbed against their left forearm and caused an abrasion. The staff member noted that the scrape was not bleeding, continued their work and left for the day. The staff member reported to the CMA the following day.

NEAR MISS SUMMARIES:

1. **SPILL SUMMARY:** 05/06/2019; A staff member working in a BSL-3 laboratory was putting away 96-well plates that had been inoculated with a Risk Group (RG) 2 agent and fixed with methanol. After performing counts on the plates, the staff member began to put them back in a bag when their glove caught the lid of another stack of plates that were already in the bag. As the staff member moved their hand out of the bag, the stack of plates came with it and all three plates fell onto the floor. The lids and the plates remained intact. The staff member, not seeing any evidence of a spill, stayed in the room, picked up the plates and called the Command Center. The CMA ruled no potential exposure.
2. **SPILL SUMMARY:** 05/20/2019; A staff member working in the BSC of a BSL-3 laboratory was pouring a small reservoir of MicroChem and a RG2 agent into a larger waste container when part of the solution dripped outside of the container and onto the surface of the BSC. At the time of the spill, the agent had not undergone the full decontamination time. The entire spill was contained within the BSC. The CMA ruled no potential exposure.
3. **SPILL SUMMARY:** 06/18/2019; A staff member working in the BSC of a BSL-4 laboratory was using MicroChem to decon a bottle that had previously contained agarose overlay. Upon dumping the MicroChem out of the bottle and into the decon pan, approximately 20mL spilled onto the surface of the BSC. The staff member confirmed that the spill was contained inside of the BSC and that their gloves and suit remained intact. The staff member called the BSL-4 control room and, after speaking to Health and Safety, cleaned the spill. The CMA ruled no potential exposure.
4. **SPILL SUMMARY:** 07/17/2019; A staff member working in a BSL-3 laboratory was taking pictures of a 96-well plate on the microscope when they bumped the plate with their arm and caused

approximately 500µL of liquid from the plate to spill onto their left glove, the benchtop and the microscope. The plate was from their micro-titration of a RG3 agent. The staff member immediately held their breath, placed the plate and their contaminated gloves in the BSC and left the room. The staff member placarded the door of the room and, after speaking to a member of Health and Safety and allowing for the aerosols to settle, was permitted to return to the laboratory wearing an Assigned Protection Factor (APF) 1000 Powered Air Purifying Respirator (PAPR) to decontaminate the areas of the spill.

5. **SPILL SUMMARY:** 07/19/2019; A staff member working in a BSL-2 laboratory was reorganizing items in the BSC when they bumped a stack of pipette tip boxes, and one of the boxes fell outside of the BSC. Agent was not being used in the BSC at the time of the incident. Upon further investigation, it was determined that the BSC was slightly overcrowded. Staff should always avoid storing items in BSCs and remove any items in the BSC that are not necessary for their work prior to starting.

OTHER OCCURENCES

1. **PROCEDURAL FAILURE SUMMARY:** 05/06/2019; A staff member working in a BSL-2 laboratory was removing items from a -80C freezer when they noticed a sealed Ziploc bag frozen to the back corner of the freezer shelf. The Ziploc bag contained a 15mL conical tube containing a vial of RG1 agent, both the conical and vial were labeled appropriately. Upon further investigation, it was determined that the -80C freezer had been moved, with Health and Safety approval, to the lab from another BSL-2 laboratory without being defrosted. The staff member contacted the group responsible for the vial and was permitted to dispose of the agent. Health and Safety would like to remind staff that freezers should be regularly defrosted to reduce the potential for lost items, temperature fluctuations and equipment malfunction. Additionally, staff should ensure that freezers and fridges are completely empty before transferring to another group.
2. **PROCEDURAL FAILURE SUMMARY:** 06/06/2019; A staff member working in a BSL-4 laboratory started a liquid autoclave cycle without submerging the load probe, causing the autoclave to go into alarm. The alarm was not noticed by staff members until the next day. By using suite entries documented on the BSL-4 calendar, a member of Facility Management Operations (FMO) was able to track down the staff member that ran the cycle to determine the contents of the autoclave and whether it was safe to restart the cycle. Once the alarm was cleared, the autoclave cycle was restarted. Health and Safety would like to emphasize the importance of using the BSL-4 Outlook Calendar as it was able to serve as a resource in this situation.
3. **PROCEDURAL FAILURE SUMMARY:** 06/13/19; A staff member conducting inventory of a -80C freezer in a BSL-4 laboratory noticed that a 50mL conical tube had leaked and material was frozen around the cap. The tube was inside a sealed bag and there was no spill of agent. Upon inspection, the staff member was unable to determine whether the cap lost integrity or if the cap's threads were not properly seated when the tube was initially filled and stored. The tube and its contents were destroyed. The staff member and Health and Safety staff are working together to determine if there are better products for storage at these low temperatures.
4. **PPE FAILURE SUMMARY:** 06/20/19, A staff member working in the BSC of a BSL-3 laboratory was pipetting a RG3 agent when they noticed a tear in their outer glove. There had been no reported spills in the BSC and the staff member tested their inner glove and confirmed that it remained intact.
5. **PPE FAILURE SUMMARY:** 07/05/2019; A staff member that had been working in the BSL-4 was exiting through the chemical shower when they discovered a small hole in the left shoulder of their

Sperian suit (#282). After exiting the shower to the suit room, the staff member called the control room and reported the hole to Health and Safety. The suit was able to be repaired. The CMA ruled no potential exposure.

6. **PROCEDURAL FAILURE SUMMARY:** 07/17/2019; A staff member working in the BSC of a BSL-4 laboratory was opening a bag containing 5mL tubes of RG4 agents when they noticed that approximately 1mL of liquid had leaked into the bag and onto the sides of one of the tubes. Because the tubes were stored in the same bag, the staff member was unable to determine whether one tube or all of the tubes had leaked. After inspecting the tubes, the staff member was also unable to determine whether the caps lost integrity or if their threads were not properly seated when the tube was initially filled and stored. Additionally, the staff member also noted that the tubes appeared to have been stored on their side before freezing. The bag was intact and had not been opened outside of the BSC. The tubes and the bag were decontaminated and discarded.
7. **PROCEDURAL FAILURE SUMMARY:** 07/25/2019, A staff member placed a rack of tubes containing sterile material in an airlock to be transported to a BSL-2 laboratory without using a secondary container. After 15 minutes, the staff member on the non-containment side of the airlock retrieved the rack of tubes and transported it to a BSL-2 laboratory, also without the use of a secondary container. The Sterility Memo for the samples dictated that they were to be transported using a secondary container. However, the staff member that prepared the samples and placed them in the airlock did not have a copy of Sterility Memo with them and assumed that because the samples were sterile they could be moved in the same manner as manufacturer sealed sterile material. It was also assumed that the receiving staff member would bring a secondary container from the non-containment side to retrieve the samples. After discussing the incident with the staff members, Health and Safety will update the Sterility Memo SOP and template to include detailed instructions on the transport of sterile material both inside and outside of containment.
8. **PROCEDURAL FAILURE SUMMARY:** 07/26/2019; Two staff members were tasked with transporting bacterial lysates between two different laboratories and did not have the two-way radio and communication with Security as is required for a BSAT transport. One staff member did not realize that the samples were still considered BSAT, but when they confirmed that the samples were BSAT after the move, they self-reported the issue.

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) or represented a CDC Form 3 submission.

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

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