



# Lessons Learned & Success Stories – June to August 2017 Report

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The NBACC 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. A staff member discovered that a new type of tape that was being used for pressure testing BSL-4 suits prior to use was producing unsatisfactory results. The tape was leaking air during the pressure test and the suits would not consistently pass the test. The staff member replaced all of the new type of tape in the BSL-4 with the old type of tape that had proven to be successful for pressure testing in the past.
2. A staff member was trying to determine the extent of the issue with an electric garage opener. When it had been determined that it would open properly but not close properly, the unit was unplugged in order to manually close the door. After the door was closed the staff member realized they forgot to turn on the garage light and were therefore left in the dark. Utilizing experience from a previous BSL-4 Emory University Onsite Applied Biosafety Training Program where staff members had black bags placed over the tops of their suits to simulate a power outage in the suite, the staff member moved forward and kicked with their feet (to avoid suddenly tripping over an object) while their hands were outstretched. The staff member was successful in finding the door leading into the house and nearby light switch with no injuries.
3. While processing a sample containing spores through the Influx sorting flow cytometer, a clog occurred. Staff followed the Nozzle Obstruction Procedure and briefly stopped sample flow. The sort chamber door was then opened and a small amount of fluid (5-10 mL) was observed on the floor of the sort chamber; nothing was observed outside the sort chamber or outside the BSC. They proceeded to spray all surfaces inside of the sort chamber with 10% bleach, and allowed 10 min of contact time. The sort chamber was then cleaned and decontaminated. They also flushed the sample line with 10% bleach, and left bleach in the sample line (and in contact with the nozzle tip) overnight.

Since this potential scenario had been thought through beforehand and by following the established SOP, the operator and all team members in the room were protected from any potential exposure through multiple layers of engineering and procedural controls. The flow cytometer is located inside a custom BSC, and the sort chamber itself is always under negative pressure. Aerosol containment of the system is tested quarterly, thus any unwanted aerosols are directed away from the operator and into the HEPA filters of the BSC. Everyone in the room was wearing respiratory protective equipment (RPE) (N100 or PAPR) as is required during sorting. Lastly, the fluid that escaped the

waste drain during the clog was successfully contained within the sort chamber as expected and was able to be decontaminated and cleaned.

#### **LESSONS LEARNED:**

1. In the upcoming months as new Purified Air Personal Respirator (PAPR) policies are in the process of being implemented, take time to re-evaluate laboratory processes and procedures to determine if any adjustments need to be made to accommodate limitations of the PAPR.
2. Some staff members have received microscope training, which has provided beneficial information and improved knowledge of the workings of the microscope. Trainings should continue and be expanded to include all relevant laboratory staff.
3. With the continued effort to increase safety within NBACC, the need for proper training of individuals who enter and perform tasks within the laboratories is paramount. Safety procedures and engineering controls that have or will be implemented may have the capacity to increase safety as well as reduce the potential of exposure for the laboratorian; however, review of recent near miss summaries by the Institutional Safety Committee (ISC) indicates the current training on several procedures may be insufficient. Even if engineering controls are implemented, the potential for near misses or events remains if individuals are not properly trained on laboratory operations, equipment, or engineering controls. Recent efforts to retrain staff on the use of specific instruments have begun to reap rewards of increased understanding of how to effectively operate laboratory equipment, and thus, increase laboratory safety. Redoubling these efforts to ensure staff is properly trained to perform the necessary tasks at hand in conjunction with periodic refresher training to ensure that learned protocols do not become stale or forgotten will provide a robust foundation for a safe laboratory work environment.
4. Finger cuts are common workplace injuries and are sometimes unavoidable accidents. However, precautions can be taken to reduce the risk of cuts in the workplace. One such precaution is using heavy work gloves or cut resistant gloves in situations where an open blade is present. Additionally, use the proper tool that is appropriate for the job; just because the tool may work for a particular situation does not mean that it is the appropriate or best tool for the job.
5. Work in containment requires slow, deliberate movements and an awareness of your surroundings at all times. Spills can frequently be prevented when working in this manner and arranging your work carefully to minimize or eliminate crossing over your work space. Always work "clean to dirty" and look for improvements in a process. This may mean evaluating pipetting techniques, looking for lower-sided containers to prevent awkward postures in the BSC, and considering alternative ways to decontaminate plates and other infectious material.

#### **EVENT SUMMARIES:**

1. **FIRST AID SUMMARY:** 05/03/2017; A staff member sustained a paper cut while breaking down boxes in the BSL-3. The Certified Medical Authority (CMA) applied first aid and ruled no potential exposure. No restrictions resulted from the injury.
2. **FIRST AID SUMMARY:** 05/04/2017; A staff member cut their hand on a sharp piece of metal under a sink in a BSL-2 lab. The CMA applied first aid, and no restrictions resulted from the injury.
3. **OSHA RECORDABLE INJURY:** 05/08/2017; A staff member sustained a back injury while moving a compressed gas cylinder with a cylinder dolly into a BSL-2 lab. The injury resulted in four restricted days. A new dolly that does not require as much labor to use was procured for this task.
4. **FIRST AID SUMMARY:** 05/26/2017; A staff member burned their arm on a hot steam pipe in an autoclave utility cabinet. The CMA applied first aid, and no restrictions resulted from the injury.

5. **FIRST AID SUMMARY:** 06/08/2017; A staff member sustained a cut on their finger while in an office area. No restrictions resulted from the injury.
6. **FIRST AID SUMMARY:** 06/23/2017; A staff member cut their thumb while using a utility knife to remove a gasket on a Class III HEPA filter. The glovebox was decontaminated at the time of the injury and the employee was wearing latex gloves. The CMA ruled no potential exposure.
7. **FIRST AID SUMMARY:** 06/30/2017; A staff member cut their finger on a cardboard box while working in the BSL-4 buffer corridor. No restrictions resulted from the injury.

#### **NEAR MISS SUMMARIES:**

1. **PPE FAILURE SUMMARY:** 05/01/2017; A staff member reported a glove tear while outside of a BSC labeling empty tubes on the benchtop in the BSL-3. The CMA ruled no potential exposure.
2. **PPE FAILURE SUMMARY:** 05/02/2017; A staff member reported a leak in their BSL-4 suit (Sperian #219) at the shoulder. The CMA ruled no potential exposure. The suit was repaired and returned to service.
3. **LAB PROCESS FAILURE SUMMARY:** 05/04/2017; A staff member reported a spill of a RG2 agent while working in a BSC in a BSL-2 lab. The CMA ruled no potential exposure.
4. **LAB PROCESS FAILURE SUMMARY:** 05/09/2017; A staff member reported that they did not don a laboratory coat prior to commencing work in a BSC in BSL-3. They worked for about 10-15 minutes before they noticed the oversight.
5. **LAB PROCESS FAILURE SUMMARY:** 05/10/2017; A staff member reported that an autoclave timed out at the end of its sterilization cycle. After a review of the record, Health and Safety approved the load to be removed. An incorrect cycle was chosen for this load due to the employee not wearing prescription glasses at the time.
6. **EQUIPMENT FAILURE SUMMARY:** 05/16/2017; A staff member identified a BSC HEPA filter leak during certification. The leak was repaired and the BSC was certified. The BSC had not been used since the previous BSC certification.
7. **LAB PROCESS FAILURE SUMMARY:** 05/19/2017; A staff member cracked a microscope slide containing a RG2 agent while working in the BSL-3. While the staff member was working, an alarm sounded by the microscope due to an overheating potential. The worker bumped the microscope stage while trying to attend to the overheating issue, which caused the slide to crack. The worker was wearing a PAPR at the time and the CMA ruled no potential exposure.
8. **LAB PROCESS FAILURE SUMMARY:** 05/23/2017; A staff member cracked a microscope slide containing a risk group (RG) 2 agent while working in the BSL-3. The worker reported that their vision was impaired by the PAPR they were wearing at the time. The CMA ruled no potential exposure.
9. **EQUIPMENT FAILURE SUMMARY:** 05/24/2017; A staff member identified a BSC HEPA filter leak during certification. The leak was repaired and the BSC was certified. The CMA ruled that no staff were potentially exposed.
10. **LAB PROCESS FAILURE SUMMARY:** 05/25/2017; A staff member reported a spill of cell culture media while working in a BSC in a BSL-4 lab. The CMA ruled no potential exposure.
11. **LAB PROCESS FAILURE SUMMARY:** 05/26/2017; A staff member reported a spill of cells while working in a BSC in a BSL-2 lab. The CMA ruled no potential exposure.

12. **PROCEDURAL DEVIATION SUMMARY:** 06/05/2017; A staff member reported that they forgot to don gloves prior to entering BSL-3 while on an immunization waiver. Their escort noticed the oversight and gloves were donned immediately. The CMA ruled no potential exposure.
13. **PPE FAILURE SUMMARY:** 06/07/2017; A staff member reported an outer glove tear while working in a BSC in a BSL-3 lab. The inner glove was intact. The CMA ruled no potential exposure.
14. **PROCEDURAL DEVIATION SUMMARY:** 06/12/2017; It was reported that a staff member did not don RPE prior to entering an ABSL-3 procedure room. The staff member was retrained on the entry and exit procedures for ABSL-3. The CMA ruled no potential exposure.
15. **SPILL SUMMARY:** 06/14/2017; A staff member reported that a permanent marking pen fell out of a BSC in a BSL-3 lab. The staff members in the room were in RPE at the time of the incident, and the CMA ruled no potential exposure.
16. **PPE FAILURE SUMMARY:** 06/14/2017; A staff member reported an outer glove tear while working in BSL-3. The inner glove was intact. The CMA ruled no potential exposure.
17. **LAB PROCESS FAILURE SUMMARY:** 06/16/2017; A staff member reported that the lid of an media tube had come off during the night in the rotator/incubator in BSL-3. The missing lid was noticed while the tube was in the BSC. There was no growth in the tube. The CMA ruled no potential exposure.
18. **PPE FAILURE SUMMARY:** 06/16/2017; A staff member reported an outer glove tear while working with animal cages in the Vivarium. The inner glove was intact. The CMA ruled no potential exposure.
19. **SPILL SUMMARY:** 06/16/2017; A staff member reported that an small amount of liquid material (non-infectious) had pooled under a waste bag in a BSL-2 lab. The CMA ruled no potential exposure.
20. **EQUIPMENT FAILURE SUMMARY:** 06/19/2017; A staff member reported that they cracked a microscope slide in the BSL-3. The microscope was not functioning properly due to a loose stage screw. The staff members were in RPE at the time of the incident. The CMA ruled no potential exposure. As a corrective action, the screw was repaired, the staff will receive training on microscope operations and the SOP will include a mandatory assurance check on the stage screws for all operators.
21. **PROCEDURAL DEVIATION SUMMARY:** 06/20/2017; A staff member reported that they mistakenly removed their RPE in a BSL-3 hallway while on a medical restriction requiring them to wear RPE. The CMA ruled no potential exposure.
22. **EQUIPMENT FAILURE SUMMARY:** 06/23/2017; A staff member reported a pin hole leak in an integrated Class III BSC glove. The glove of the staff member was intact and the Class III BSC maintained negative pressure. The CMA ruled no potential exposure.
23. **EQUIPMENT FAILURE SUMMARY:** 06/23/2017; A staff member discovered a pin hole leak in an integrated Class III BSC glove while performing preventive maintenance. The glove of the staff member was intact and the Class III BSC maintained negative pressure. The CMA ruled no potential exposure.
24. **PPE FAILURE SUMMARY:** 06/29/2017; A staff member reported an outer glove tear in their BSL-4 suit glove. Their inner glove was intact. The CMA ruled no potential exposure.
25. **EQUIPMENT FAILURE SUMMARY:** 06/30/2017; A staff member reported a pin hole leak in an integrated Class III BSC glove. The Class III BSC maintained negative pressure, and the CMA ruled no potential exposure.

26. **EQUIPMENT FAILURE SUMMARY:** 07/13/2017; Two staff members reported that a piece of foam insulation from an electrical outlet in a decontaminated Class III BSC came off when the two staff members were inside of the BSC. The CMA ruled no potential exposure. All BSCs will be checked by Health and Safety to establish if the foam is secure or not.
27. **SPILL SUMMARY:** 07/19/2017; A staff member under a BSL-3 mentorship was encouraged to report a small amount of liquid disinfectant splashed out of a BSC while the employee was performing a decontamination of the BSC. The individual reported the cause of the incident to be unfamiliarity with the method of disinfection. There was some concern from the mentor that this individual was rushing through the task and was corrected. The CMA ruled no potential exposure.
28. **PPE FAILURE SUMMARY:** 07/25/2017; A staff member reported an outer glove tear (nitrile) while working in a BSC in a BSL-3 lab. The inner glove was intact, and the CMA ruled no potential exposure.
29. **SPILL SUMMARY:** 07/26/2017; A staff member reported a spill of a RG 4 agent inside of a BSC in a BSL-4 lab. The spill occurred when the decontamination pan was jostled slightly. The CMA ruled no potential exposure.
30. **SPILL SUMMARY:** 07/27/2017; A staff member reported a small spill of methanol fixed RG 2 agent onto the benchtop in a BSL-3 lab. The CMA ruled no potential exposure.
31. **SPILL SUMMARY:** 07/27/2017; A staff member reported a small spill of a 96 well plate of a RG 4 agent inside of a BSC in a BSL-4 lab. The staff member was attempting to pour the contents of the plate into a decontamination pan. The CMA ruled no potential exposure.

#### **OTHER OCCURRENCE SUMMARIES:**

1. **SPILL SUMMARY:** 06/06/2017; A staff member reported that uncontaminated water was leaking from an incubator in a BSL-3 suite. The incubator water jacket had been overfilled earlier in the day. The water was cleaned up and the staff was retrained on the water jacket filling procedure
2. **PROCEDURAL DEVIATION SUMMARY:** 06/12/2017; A staff member reported that they mistakenly wore jewelry into a BSL-3 lab. They noticed the oversight immediately, and the jewelry was decontaminated out of the suite.
3. **FACILITY FAILURE SUMMARY:** 06/21/2017; A staff member reported that they could not exit into the women's side change room of a BSL-3 suite. The cause of the mishap was a faulty PIN reader which was reset and placed back into service.
4. **LAB PROCESS FAILURE SUMMARY:** 07/11/2017; A staff member reported that a sharps container exploded its contents onto the walls and floor of a BSL-4 autoclave. There was no loss of containment outside of the autoclave. The root cause was due to autoclave bags being tied shut before being placed into the large sharps container. The following corrective actions were taken to prevent a re-occurrence of the incident: Any serological pipettes will henceforth be placed in autoclave bags and will remain slightly rolled at the top prior to being placed in sharps containers. It is recommended that an autoclave "liquid cycle" be selected for any loads with large numbers of bagged serological pipettes.
5. **PPE FAILURE SUMMARY:** 07/12/2017; A staff member reported an inner glove tear (nitrile) while they were removing a BSL-4 suit. The outer glove was intact.
6. **PPE FAILURE SUMMARY:** 07/13/2017; A staff member reported a tear in their Tyvek coveralls while working in the ABSL-3. Their scrubs did not get torn during the event.

**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, 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.