Lessons Learned & Success Stories – March to May 2018 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. After a few near misses resulting in pipette tips being deposited on the BSC workspace (instead of the intended sharps bin), staff worked with Facilities staff to develop a guard that would position the sharps container in a manner that prevents inadvertent movement and the potential for pipette tips to be ejected outside of the container. Used tips being ejected onto the BSC workspace represents not only a biosafety concern (a spill of infectious material) but also a sharps concern, since currently staff have to handle the used tips to clean them up. The prototype will be sent to a machine shop for multiple guards to be fabricated for installation on all of the robots. This guard will likely prevent this type of near miss in the future.
2. At 12:45 am on a Saturday morning, the BSL-4 laboratory space manager (LSM) received a remote notification that the -80 freezer in one of the rooms was in alarm. They notified two on-call employees; one was able to enter the BSL-4 suite by 3:00 am while the other employee served as the Control Room Operator. They confirmed the freezer was crashing and moved items from that freezer to another available freezer. This is an example of a situation where the remote notification worked correctly and downstream response was well-executed.

LESSONS LEARNED:

3. As we begin the new program year, take a moment to review project risk assessments. Whether it is a risk assessment that is being renewed or a new one, ensure that all possible procedures and equipment are considered and referenced. In some cases, it may not be known from the onset what specific procedures or equipment are required. It's acceptable to include these in the risk assessment even though they might not ultimately be used; by doing so it will alleviate the need for a MFR for a minor change.
4. Always inspect your equipment and personal protective equipment (PPE) before starting work. If a necessary piece of safety gear is too small, broken or unavailable, speak up. Take personal responsibility for your safety and make sure you have what you need to do the job correctly, not just quickly.

5. If you are escorting a visitor of the opposite sex into BSL-3/4, make sure that your instructions to your visitor are clear regarding what cannot be worn into containment. Even if you think they understand the rules, or have been here many times, reiterate the rules to them every time they enter the lab.

EVENT SUMMARIES:

1. **FIRST AID SUMMARY:** 02/01/2018; A staff member cut their finger while using a pair of scissors in an office area. The certified medical authority (CMA) applied first aid and the staff member was restricted from BSL-2, -3 and -4 until the wound healed. (There was no need for this worker to enter containment during that time.)

2. **FIRST AID SUMMARY:** 02/05/2018; A staff member cut their finger while attempting to pull an electric plug from a wall outlet in an office area. The CMA applied first aid and the staff member was restricted from the lab for one day. (There was no need for this worker to enter containment during that time.)

3. **FIRST AID SUMMARY:** 03/02/2018; A staff member cut their finger while tightening a bolt on a HEPA caisson. They were not wearing gloves at the time. The CMA applied first aid and the staff member was restricted from BSL-2, -3 and -4 until the wound healed. (There was no need for this worker to enter containment during that time.)

4. **FIRST AID SUMMARY:** 03/07/2018; A staff member reported to the CMA with two metal splinters in fingers that were sustained while repairing the magnetic lock on an interstitial door. They were not wearing gloves at the time. The CMA applied first aid and the staff member was restricted from BSL-3 and -4 until follow up. (There was no need for this worker to enter containment during that time.)

5. **FIRST AID SUMMARY:** 03/12/2018; A staff member cut their finger on a small piece of plastic while removing the cover from an Intermec printer in a BSL-3 laboratory. The CMA applied first aid and the ruled no potential exposure. The staff member returned to work.

6. **FIRST AID SUMMARY:** 03/12/2018; A staff member sustained a paper cut in a non-containment hallway. The CMA applied first aid and the staff member returned to work.

7. **FIRST AID SUMMARY:** 03/28/2018; A staff member cut their hand while opening the lid of a chemical spill kit in a non-containment hallway. The CMA applied first aid and the staff member returned to work.

8. **FIRST AID SUMMARY:** 04/02/2018; A staff member cut their forehead on a magnetic paper towel holder while wiping down the BSC in an ABSL-3 laboratory. The CMA applied first aid and the staff member was restricted from BSL-2, -3 and -4 laboratories until the wound healed. The paper towel holder was moved to the side of the BSC.

9. **FIRST AID SUMMARY:** 04/03/2018; A staff member scraped their hand while placing a powered air purifying respirator (PAPR) charging unit in an airlock. The CMA applied first aid and the staff member was restricted from BSL-3 and -4 laboratories until the wound healed.

10. **FIRST AID SUMMARY:** 04/03/2018; A staff member scraped their buttock on the drawer of a plastic rolling cart in a BSL-3 laboratory. The CMA applied first aid and the staff member was restricted from BSL-3 and -4 laboratories until the wound healed.

11. **FIRST AID SUMMARY:** 04/24/18; A staff member complained of discomfort in their upper chest after leaning over a railing to hold a valve during the preventative maintenance of an effluent decontamination system tank. The staff member's height and arm length contributed to the awkward

position required to hold the valve. Facilities staff will evaluate placing padding on this railing prior to the next time this valve is manipulated.

12. **OSHA INJURY SUMMARY:** 04/26/2018; A staff member developed an adverse effect to a vaccine. The staff member missed one day of work.

NEAR MISS SUMMARIES:

13. **SPILL SUMMARY:** 02/02/2018; A staff member reported that a small amount of material containing a Risk Group (RG) 3 agent spilled onto an absorbent pad on the floor of a BSC in a BSL-3 laboratory. The RO was informed and the CMA ruled no potential exposure.

14. **SPILL SUMMARY:** 02/15/2018; A staff member reported that they accidentally knocked a P200 pipette out of a BSC in a BSL-3 laboratory. Two workers were present, preparing to start work, and in respiratory protection. The Responsible Official (RO) was informed and the CMA ruled no potential exposure.

15. **PPE FAILURE SUMMARY:** 02/15/2018; A staff member reported an outer glove tear (nitrile) as they were working with a RG3 agent in a BSC in a BSL-3 laboratory. The RO was informed and the CMA ruled no potential exposure.

16. **SPILL SUMMARY:** 03/01/2018; A staff member reported a spill of contaminated micropipette tips from a robot in a BSC in a BSL-3 laboratory. The robot had gone into alarm and ejected its pipette tips short of the sharps container. The RO was informed and the CMA ruled no potential exposure.

17. **PROCEDURAL FAILURE SUMMARY:** 03/12/2018; A staff member forgot to don an outer set of gloves while on an immunization waiver while they were looking at plates under a microscope. Their inner gloves were intact and they immediately put on the outer gloves prior to continuing work. The RO was informed and the CMA ruled no potential exposure.

18. **PROCEDURAL FAILURE SUMMARY:** 03/16/2018; A staff member experienced a BSL-4 suit glove tear (Mapei®) in the BSL-4 while removing empty racks from an LN2 freezer. The worker did not use insulated (cryo) gloves to handle materials from the LN2 tanks and the suit glove froze and tore. The inner glove was intact. The RO was informed and the CMA ruled no potential exposure.

19. **SPILL SUMMARY:** 03/27/2018; A staff member reported that a tube of a RG3 agent slipped out of the worker's hand and fell out of a BSC in BSL-3. The two workers in the room were not required to be in respiratory protective equipment (RPE) at the time and they evacuated immediately. The RO was informed and the CMA ruled no potential exposure.

20. **PROCEDURAL FAILURE SUMMARY:** 04/05/2018; A staff member working in a BSL-2 laboratory took a box of pipette tips that are used exclusively in the BSC and used them to conduct work in a chemical fume hood. The box had a piece of tape on the lid but there was no other indication that these pipettes were to be used in the BSC. The box was discarded and the chemical fume hood was decontaminated. Moving forward, the tip boxes will be labeled. The CMA was informed and ruled no potential exposure.

21. **PPE FAILURE SUMMARY:** 04/09/2018; A staff member reported a Class III BSC integrated glove tear while assembling a piece of equipment. Their inner glove remained intact. The CMA ruled no potential exposure.

22. **PROCEDURAL FAILURE SUMMARY:** 04/11/2018; Several staff members were working in the decontaminated quad of the BSL-4 when they noticed that the tape seal between the temporary wall and the walls of the BSL-4 corridor had breached. The breach was likely due to pressure changes from personnel continually entering and exiting on the containment side of the wall. The pressure in the BSL-4 draws air into the containment side, so when the seal broke the air was pulled into the containment side of the corridor. The seal was repaired and this type of temporary wall will now be routinely checked by Facilities staff. The RO was informed and the CMA ruled no potential exposure.

23. **SPILL SUMMARY:** 04/11/2018; A staff member knocked a marker out of the BSC in a BSL-4 laboratory. The CMA ruled no potential exposure.

24. **PROCEDURAL FAILURE SUMMARY:** 04/12/2018; A staff member reported that they entered a BSL-3 airlock from the non-containment side during the 15 minute air wash. The CMA ruled no potential exposure.

25. **PPE FAILURE SUMMARY**: 04/18/2018; A staff member reported a pinhole in their BSL-4 suit (Sperian #213). The suit was repaired. The CMA ruled no potential exposure.

26. **SPILL SUMMARY**: 04/24/18; A staff member working in a BSL-3 laboratory reported that when they were moving a transfer pipette to a sharps container, the pipette slipped from their hand and landed outside of the BSC. The CMA ruled no potential exposure.

27. **PROCEDURAL FAILURE SUMMARY:** 04/24/2018; A staff member working in a BSL-4 laboratory was observed removing items that had not undergone a full 5 minute decontamination from the BSC. The staff member also failed to decontaminate their poly-paper prior to bringing it out through the chemical shower. The staff member was retrained.

OTHER OCCURRENCES:

28. **PROCEDURAL FAILURE SUMMARY:** 02/16/2018; A staff member reported that solid organic material was found in a ABSL-3 drain trap on 02/16/2018 and 02/20/2018. There was a large amount of organic material on 2/20/2018. A meeting was held to remind relevant staff to keep drain screens in place during husbandry tasks. A second CAPA was created to track any corrective actions and their effectiveness.

29. **PROCEDURAL FAILURE SUMMARY:** 02/28/2018; A staff member reported that they mistakenly performed a procedure that was not listed on the project risk assessment (RA). Upon completion of the procedure, staff members reviewed the RA and determined it was missing. An MFR was immediately drafted to include the method in the project risk assessment.

30. **FACILITY FAILURE SUMMARY:** 03/01/2018; A subcontractor reported that the screw-in plugs for the injection ports on the containment HEPA caissons were only hand tight. A ticket was created to tighten all injection ports plugs a quarter turn.

31. **PROCEDURAL FAILURE SUMMARY:** 03/13/2018; A staff member reported that a BSL-4 autoclave went into alarm due to a failed sterilization. The cause of the problem was that the wrong cycle was selected and the load probe was not placed into water. The autoclave cycle was repeated by the autoclave technician to include a 10 hour sterilization time.

32. **EQUIPMENT FAILURE SUMMARY:** 03/14/2018; A staff member discovered that two bags of trash in the BSL-3 (one inside the other) had ripped along their seams. There was no spill of any material from the bags. It is recommended that trash bags seams be inspected prior to their use.

33. **SPILL SUMMARY:** 03/27/2018; A staff member reported that a disinfectant container was accidentally bumped and overturned while working with a robot in a BSC in a BSL-4 laboratory. Further refinements to the design and functioning of the robot procedures are being investigated.

34. **PROCEDURAL FAILURE SUMMARY:** 04/10/2018; The immune status of a staff member that was returning from medical leave was not verified during their 'fit for duty' physical. The day after the physical, it was determined that the staff member had been out of compliance for 24 hours and their BSL-3 access was restricted until a PAPR waiver was approved.

35. **PROCEDURAL FAILURE SUMMARY:** 04/24/2018; A subcontractor wore their watch across the line of containment. The subcontractor was being escorted by a member of the opposite sex and was allowed to cross the line of containment unsupervised. The watch was bleached out. A request has been made to change the SOP and process to include that a trained, unescorted staff member must always do a visual check on the visitor prior to them stepping over the line of containment.

36. **PROCEDURAL FAILURE SUMMARY:** 04/24/18; A subcontractor pushed their utility cart across the line of containment in the change room. The subcontractor was being escorted by a member of the opposite sex and was allowed to cross the line of containment unsupervised. The cart will be brought out of containment during the next VHP decon. A request has been made to change the SOP and process to include that a trained, unescorted staff member must always do a visual check on the visitor prior to them stepping over the line of containment.

37. **PROCEDURAL FAILURE SUMMARY:** 04/30/2018; A subcontractor failed to cover their ring with tape prior to entering containment. The ring was immediately covered with tape in containment and bleached out at the end of the day.

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.

This work is funded under Contract No. HSHQDC-15-C-00064 awarded by the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) to The National Biodefense Analysis and Countermeasures Center (NBACC), a Department of Homeland Security federal laboratory (DHS) sponsored by the DHS Science and Technology Directorate and operated by the Battelle National Biodefense Institute. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the DHS or S&T. In no event shall DHS, NBACC, S&T or Battelle National Biodefense Institute have any responsibility or liability for any use, misuse, inability to use, or reliance upon the information contained herein. DHS does not endorse any products or commercial services mentioned in this publication.