

2018 General Laboratory Finding Guidance

FINDING	Checklist #	Section	GUIDANCE	DCR (*)
Space registration was not accurate. or Green card was not accurate and/or missing.	GS-1	General Safety	<p>Information on the hazards, activities and /or emergency personnel for room(s) in roomset for PI/Supervisor is not up to date in the PI Space Registration system. This should be kept current on an ongoing basis and reviewed at a minimum of once a year.</p> <p>Green Card outside of lab/space is not accurate or missing. The Green Card is used to: (1) to be able to contact lab members 24 hours a day if an emergency occurs inside the lab/space and (2) an emergency outside the lab impacts lab equipment (e.g. water leak that may damage equipment). Knowledgeable lab members could provide valuable information about the current hazards to the MIT Emergency Response Team and the Fire Dept.</p>	
Rooms were not posted with warnings for the hazards present in the room.	GS-2	General Safety	<p>One or more of the following signs required due to potential hazards as determined by PI space registration might be missing: radioactive material, BL, laser, magnetic field, etc. Reference: OSHA Lab Standard 29CFR1910.1450 and NFPA 45</p>	
Required EHS training was not up to date.	GS-3	General Safety	EHS Training must be kept up to date for all current lab members.	
The appearance of the laboratory/shop was not neat, orderly and clean.	GS-4	General Safety	<p>Poor housekeeping can lead to trip/fall hazards, as well as life/fire safety code violations. Examples of poor housekeeping include: storage of materials in aisle ways between laboratory benches, restricted or block exits, cluttered work surfaces, desks and bench tops, as well as blocked emergency equipment. Waste containers of all types should be emptied on a regular basis. Do not stack containers.</p> <p>Clean-up of spills is addressed in GS-5. Lab benches should be free of chemical residues, razor blades and other sharps.</p> <p>Any items which must be stored in aisleways should be positioned on only one side. Aisleways in work areas must be maintained a minimum of 36 inches. Main corridors must be maintained a minimum of 44 inches.</p> <p>Leaks from pipes, ceiling or other facility related equipment should be reported immediately to the local facilities zone office. Caution tape, barriers or warning signs should be erected to warn others who may enter the area until such time as the leak has been repaired and the area cleaned.</p> <p>For general purpose storage, a rule of thumb is 15 pounds per sq. foot of wall mounted shelf. Heavy items should preferably be stored on free-standing storage shelving that has been designed for that purpose and the heaviest items should be stored on the lowest shelves. Avoid storing power supplies, monitors and CPUs on standard wall shelving that is intended for book storage. Storage must be kept a minimum of 18 inches from ceiling or wall mounted sprinkler heads. Storing items on the tops of fume hoods is prohibited.</p>	
There was evidence of spills not properly cleaned up.	GS-5	General Safety	Evidence of spills not properly cleaned up may include: liquid or solid residues, stains, discolored surfaces or puddles anywhere in space, including around benches, floors and/or equipment.	
There was evidence of eating and/or drinking in the area.	GS-6	General Safety	<p>No eating, drinking, gum-chewing or applying cosmetics are allowed in the lab/space. Do not store food, drink, cups or other eating and drinking utensils in the lab/space. Additionally, empty food or drink containers/wrappings must not be disposed of in the lab/space trash can, even if consumed outside the lab/space.</p> <p>The State of Massachusetts Radiation Control Program does not allow eating, drinking, or cosmetic application in the vicinity of radioactive materials. Reference: Massachusetts Department of Public Health 105CMR120</p>	
Vacuum aspirator setup was incorrect or was missing in-line filter.	GS-7	General Safety	Tap water cannot be used to generate a vacuum for aspiration of chemicals. All house vacuum systems must be protected by an appropriate filter.	

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Non-BL Lab Sharps were not properly managed.	GS-8	General Safety	<p>Non-contaminated sharps may include: pipettes, non-functional needles & syringes, slides, cover slips, blades, and broken glass. Place these items in a puncture-proof container for disposal in the regular trash. For potential re-useable needles & syringes, dispose of them as contaminated sharps.</p> <p>Contaminated sharps and laboratory debris include material having free liquids or gross contamination by hazardous chemicals. These are to be accumulated in accordance with MIT hazardous waste regulations in leak-proof, sealable, and puncture-proof containers. 5-gallon containers are currently provided by the EHS Office for the accumulation of this waste.</p> <p>Biologically contaminated sharps: See BS9 (Modified: 09/22/2008)</p>	
Personnel were not aware of or following drain disposal guidelines.	GS- 9	General Safety	<p>Drain disposal guidelines must be followed. The EHS Office has developed a list of chemicals and materials that may be discharged into sinks or floor drains based on regulatory requirements, MIT EHS policy and professional judgment regarding the potential impact of a chemical if discharged down the drain. Only materials that are described in these guidelines may be discharged to drains unless authorized by EHS.</p> <p>Discharge pH must be maintained between 5.5 and 12. Some drains may be connected to treatment systems. Materials with a pH below 2 or above 12 must generally be collected as a hazardous waste. Tap water cannot be used for vacuum aspiration of chemicals or for non-contact cooling purposes.</p> <p>Inspect sink areas to determine if there is evidence of chemicals being disposed to drain, vacuum aspiration or non-contact cooling with tap water. If there is evidence or likelihood of drain disposal, ask persons working in the area what gets disposed to the drain and if they are aware of the guidelines.</p>	*
Use of mechanical lifting equipment was not restricted to trained employees, and/or not under the control of a trained user, and/or not secured to prevent unauthorized use.	GS- 10	General Safety	<p>An individual in the DLC who possesses the appropriate hoisting license will be the designated person responsible for the hoisting equipment program within the DLC. The remaining employees that operate hoisting equipment in the department will work under the designated person's license. Equipment operators shall be required to complete the Crane and Hoist Safety training and if using forklifts, the Powered Industrial Trucks training. Hoisting equipment includes: overhead hoists, overhead cranes, lifting devices, powered platforms, powered industrial lift trucks and fork lifts.</p> <p>Reference: 520 CMR 6.00: Hoisting Machinery</p>	

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Lock Out Tag Out procedures were not followed where required.	GS-11	General Safety	<p>All equipment required to have the energy source locked out during maintenance and repairs must be identified. All sources of energy are included: mechanical, electrical, hydraulic, pneumatic, chemical, and thermal.</p> <p>This would not include equipment where the energy is controlled completely by unplugging the equipment from an electric outlet and where the person doing the service or maintenance has exclusive control of the plug.</p> <p>OSHA requires that workers or researchers that service or maintain machines or equipment where the unexpected startup, energization, or the release of stored energy could cause injury, be protected from this potential hazard. The Lockout/Tagout standard requires the adoption and implementation of practices and procedures to shut down equipment, isolate it from its energy source(s), and prevent the release of potentially hazardous energy while maintenance and servicing activities are being performed. Locks are supplemented by DANGER tags which identify the person responsible for the lock out, the reason, date, etc.</p> <p>If this equipment is identified, contact EHS for further guidance.</p> <p>Reference: OSHA 29 CFR 1910.147</p>	*
An appropriate sign was not posted at a known confined space.	GS-12	General Safety	<p>All confined spaces must be identified. A confined space meets all of the following criteria:</p> <ol style="list-style-type: none"> 1. Is large enough and so configured that a person can bodily enter and perform assigned work or research. 2. Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry). 3. Is not designed for continuous person occupancy. <p>Workers or researchers who are exposed to confined spaces must be informed of this by posting danger signs, or through other equally effective means. The information that must be communicated is the existence of the location, and other dangers from the confined space.</p> <p>If confined spaces are identified, contact EHS for further guidance. Reference: OSHA 29 CFR 1910.146(c) (2)</p>	*
No guardrail or other fall protection system in place for a platform, scaffold, and / or work surface higher than 4 feet.	GS-13	General Safety	<p>OSHA regulations require that any platform, scaffold or work surface, permanent or temporary, that is 4 feet or greater in height be guarded by railings. If this is not feasible, then fall protection (harness & lanyard) are necessary. This would include temporary platforms on equipment that was being serviced, maintained, repaired, adjusted or tested.</p> <p>Reference: OSHA 29 CFR 1910.23</p>	*
Lithium ion batteries or battery packs not properly stored or charged	GS-14	General Safety	<p>To reduce the flammability hazard of lithium ion batteries, Li-ion batteries used in research applications should be properly stored and charged. Batteries should only be used with the appropriate charger and should be attended while charging. Do not charge or store on a combustible surface or near combustible materials. Batteries that are hot, damaged or bulging should be disconnected and properly disposed of. Refer to the EHS guidance on lithium ion batteries for details on battery safety, handling and storage.</p>	
Other General Safety Finding (see details):	GS-99	General Safety	See finding details or ask your EHS DLC Coordinator for more information.	

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Current emergency response information (e.g., Green Cards, posters, evacuation maps, etc.) was not appropriately posted in all required areas.	EP-1	Emergency Preparedness	The MIT Emergency Response Guide Poster must be posted in every lab in a prominent place. Order a Sign & Sticker order online from the EHS webpage. Evacuation maps must be placed: next to doors leading to fire rated egress stairwells, next to elevators, and other appropriate locations that the emergency coordinator and EHS have designated. EHS Coordinators should check with their EHS Lead Contact to determine other required postings, such as radioactive material, BL, laser, magnetic field, etc., as determined by the space registration.	
Emergency eye wash stations/drench showers were obstructed.	EP-2	Emergency Preparedness	Eye wash station / drench shower must be readily accessible and the locations clearly marked with signage. Remove any obstructions around eyewashes or beneath showers that would hinder the proper use of the eyewash or shower.	
Emergency eye wash stations/drench showers were not appropriately tested / inspected / tagged.	EP-3	Emergency Preparedness	Regular testing and inspection must be performed to ensure equipment readiness in the event of an emergency. Safety Showers – run/tested twice yearly (Department of Facilities) Plumbed eye-wash stations – run/cleaned on a weekly basis (DLC) Portable eye-wash units – inspected monthly to ensure that bottles are full and that expiration date is current (DLC)	
Area was not equipped with sufficient drench showers and eye wash stations.	EP-4	Emergency Preparedness	Eye wash and drench showers are required where injurious corrosive materials are present. Inspection and maintenance is outlined by the American National Standard for Emergency Eyewash and Shower Safety. This standard applies to the design, location, testing, performance and maintenance of eyewash and safety showers. Reference: OSHA 29CFR1910.151 248 CMR 10.00 527 CMR 10.00 ANSI Z358.1 Contact EHS for further guidance including options to install additional units.	*
Fire extinguisher tag missing, outdated or monthly inspections not documented on tag	EP-5	Emergency Preparedness	OSHA requires portable extinguishers to be visually inspected monthly. Inspection items include ensuring fire extinguisher is properly charged, ring pin and tamper seal are intact, extinguisher is in good condition. Fire extinguisher tag should be initialed and dated each month indicating that this inspection was completed.	
Fire extinguisher was missing, discharged, or inaccessible.	EP-6	Emergency Preparedness	Portable fire extinguishers must be readily accessible and not blocked by equipment or other obstruction, so they are available to either trained lab personnel or emergency personnel in the event of a fire. Reference: OSHA 29CFR1910.157 527 CMR 10.00 Portable Fire Extinguishers, NFPA 10	*
Fire alarm or other emergency strobe lights were obstructed.	EP-7	Emergency Preparedness	Storage must be kept away from strobe lights (at least 12 inches) so that the flashing light can be seen in all directions in an emergency.	
Clearance around sprinklers was less than 18".	EP-8	Emergency Preparedness	The clearance below and horizontally from the top of the sprinkler head must be 18 inches or greater from any storage/shelving/items. Contact EHS for further guidance.	

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Appropriate Biological/chemical spill kit was not readily available.	EP-9	Emergency Preparedness	<p>Biological: Biological spill materials should include disinfectant (e.g., low-mercury bleach) gloves, paper towels or other absorbent material, tongs/forceps, dustpan and broom, safety glasses or face shield, spray bottle, autoclave bags for disposal, etc. The laboratory should have enough absorbent materials to deal with the largest spill possible within the area. The ability to control and contain a spill of biological materials is essential for the safe conduct of biological research.</p> <p>Chemical: Spill response equipment should be available to respond to minor spills of the hazardous materials present in the lab or space. This could be as simple as paper absorbents for labs with minor chemical use. For larger users this should include a dedicated response "kit" which would include appropriate PPE, absorbents or neutralizers suitable for the types of materials used, disinfecting agents for biologic agents if applicable and containers or bags for collection of the debris. If floor drains are present, it should include material to cover or protect the drain. Chemical Spill kits can be customized and ordered through the EHS Office for a fee email: environment@mit.edu</p>	
Other Emerg. Prep. Finding (see details):	EP-99	Emergency Preparedness	See finding details or ask your EHS DLC Coordinator for more information.	
Bio. Safety Cabinet (BSC) grates were obstructed.	BS-1	Biosafety	<p>Grates on BSC should be 100% unobstructed. If the grills in the front and back are blocked, then there will not be good airflow. Poor airflow could potentially contaminate work in the cabinet and compromise the protection of the researcher and/or the environment.</p> <p>References: NIH rDNA Guidelines and BMBL 5th edition</p>	
Bio. Safety Cabinet (BSC) was not certified or was past re-certification date.	BS-2	Biosafety	<p>A vendor sticker must be on the front of the BSC indicating dates of certification and expiration. Certification is only valid for 1 year and is the responsibility of the PI. References: NIH rDNA Guidelines and BMBL 5th edition</p>	*
Vacuum aspirator setup was incorrect or was missing in-line filter.	BS-3	Biosafety	<p>A vacuum aspirator for use with biological liquids must have a primary collection flask with disinfectant, an overflow flask with disinfectant, an in-line HEPA filter, and secondary containment for the system.</p> <p>Vacuum aspirators must have an in-line filter to protect the house vacuum line. Once the filter becomes wet, the flow of the house vacuum is compromised. Addition of the inline filter prevents potential contamination of the house vacuum system and possible exposures of personnel during vacuum system maintenance.</p> <p>To obtain information about in-line HEPA filters, please contact the Biosafety Program. Reference: BMBL 5th edition</p>	*
Biohazard labels were missing from equipment that comes into contact with biological materials/agents	BS-4	Biosafety	<p>Biohazard labels must be affixed to any piece of equipment that may be biologically contaminated or may contain biological agents, human blood, body fluids, or cell lines.</p> <p>Such equipment includes but is not limited to the following: refrigerators, freezers, incubators, shakers, sonicators, centrifuges, water baths, fume hoods, etc. Biohazard labels identify equipment and warn personnel who may be unfamiliar with the lab and the research about possible risks. Biohazard labels can be obtained through the Biosafety Program. These labels should be large enough and placed so that they are easily visible. References: OSHA BBP Standard 29 CFR 1910, NIH rDNA Guidelines, and BMBL 5th edition</p>	

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Biohazard containers were missing biohazard labels.	BS-5	Biosafety	<p>Biohazard labels must be affixed to waste containers that contain or may potentially be contaminated with live bacteria, yeast, human or animal tissues, cell lines, and other biological materials/agents.</p> <p>Biohazard labels can be obtained through the Biosafety Program. These labels should be large enough and placed so that they are easily visible.</p> <p>References: OSHA BBP Standard 29 CFR 1910, NIH rDNA Guidelines, and BMBL 5th edition</p>	
Soap was not available at sinks used for hand washing	BS-6	Biosafety	<p>Soap must be available on or near all hand washing sinks.</p> <p>References: NIH rDNA Guidelines, and BMBL 5th edition</p>	
An appropriate liquid disinfectant was not available.	BS-7	Biosafety	<p>Approved disinfectants for the biological materials/agents must be available within the lab. Common disinfectants include low-mercury bleach, Wescodyne, and 70% ethanol.</p> <p>Disinfectants must be mixed/diluted properly in order to be effective against the biological materials/agents used within the lab. Bleach solutions, once diluted, have a short shelf life and fresh solutions should be mixed frequently in order to achieve maximum potency. If questions arise about effectiveness of a particular disinfectant or a recommendation for a disinfectant, consult the Biosafety Program, as the program approves disinfectants for use within the laboratory.</p> <p>References: OSHA BBP Standard 29 CFR 1910, NIH rDNA Guidelines, and BMBL 5th edition</p>	
Work surfaces were not being decontaminated with appropriate cleaner or disinfectants following work involving biological materials/agents.	BS-8	Biosafety	<p>Researchers must regularly clean and disinfect their work areas in order to prevent the inadvertent contamination of personnel or subsequent experiments. Indicators of poor decontamination practices include visible stains or spills on bench tops or equipment and cluttered work spaces.</p> <p>References: OSHA BBP Standard 29 CFR 1910, NIH rDNA Guidelines, and BMBL 5th edition</p>	
Biohazardous sharps were not being appropriately managed.	BS-9	Biosafety	<p>All sharps from biological research laboratories are placed in leak-proof, puncture-proof containers. Signs of improper sharps management include overfilled containers (e.g., bouquet effect of pipettes for example), sharps in regular trash, disposal of intact chemical bottles and other non-sharp items in sharps containers and the inability to close the sharps container lid. Disposal of biological liquids and chemically contaminated liquids found in biological sharps container is also evidence of improper sharps management.</p> <p>To dispose of empty and intact chemical bottles, deface or remove label and place in a cardboard box for pickup. The box should be taped shut and labeled as "clean, unbroken glass bottles – trash" to be removed by custodial staff. Contact EHS for information regarding disposal of acutely hazardous chemical containers.</p> <p>Reference: 105 CMR 480</p>	*

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Biowaste was not being appropriately managed.	BS-10	Biosafety	<p>Wastes from biological laboratories must be properly handled and disposed of using appropriate methods. At MIT, biowaste is divided into three categories: solid, liquid, and sharps waste.</p> <p>Solid waste includes non-sharp/non-liquid items including but not limited to Petri dishes, tissue culture flasks, contaminated gloves, etc. These items must be disposed of in a sturdy, leak-proof container with a lid that is clearly marked or identified on all sides with large visible universal biohazard symbols. The containers should be lined with clear autoclave bags. When full, the autoclave bags should be tagged with an autoclave tag. The autoclave bags should be removed when full, autoclaved, and then disposed of in the regular trash. Deficiencies include use of a red biohazard bag, no universal biohazard labels, containers without lids, overflowing, smelly, or untagged treated waste.</p> <p>Liquid waste includes liquid cultures, media, and any other biologically contaminated liquid. These materials must be inactivated by adding a disinfectant such as bleach (final concentration >10% v/v) or Wescodyne (>1%) and poured down the drain after 20 minutes contact time with appropriate concentration of the disinfectant. Deficiencies include waste not processed in a timely manner; evidence may include films or growth of other contaminants within waste container etc.</p> <p>Biosharps waste-please refer to guidance for BS-9</p> <p>For more information on biowaste, please consult the Biosafety Program or visit the Biosafety Program web page at EHS.MIT.EDU.</p> <p>Reference: Massachusetts State Sanitary Code 105CMR 480.</p>	*
Autoclave waste treatment was not being recorded properly in logbook.	BS-11	Biosafety	<p>All biologically contaminated solid waste must be autoclaved prior to disposal in regular trash. At MIT, researchers must maintain a logbook where information such as date, name, autoclave tag number, run temperature and time are recorded. This logbook must be kept for 3 years.</p> <p>Reference: Massachusetts State Sanitary Code 105CMR48</p>	*
Needles and/or syringe stocks were not secured.	BS-12	Biosafety	All syringes and needles must be kept in a locked cabinet, drawer, or closet to minimize theft.	
Improper storage or recordkeeping for DEA Controlled Substances	BS-13	Biosafety	Describe other issues pertaining to improper storage or record keeping for DEA Controlled Substances.	*
DEA Controlled Substances were not secured properly	BS-13-1	Biosafety	DEA controlled substances should be in a double locked structure secured by a tether or bracket to the inner structure.	*
DEA Recordkeeping of material was not accurate.	BS-13-2	Biosafety	Entries into the Continuous Inventory sheet should be accurate and account for all material used, expired or remaining.	*
DEA Training records not maintained.	BS-13-3	Biosafety	Authorized user list must be complete and 290w Training up to date.	*
DEA Lab Specific SOP not on file or not signed by all users.	BS-13-4	Biosafety	A Lab Specific SOP for Use of DEA Controlled Substances must be completed and on file with Continuous Inventory record and all authorized users must sign and date that they have read the Lab Specific SOP for use of DEA Controlled Substances..	*
Biological Level (BL1, BL2, BL2+, etc.) not posted.	BS-14	Biosafety	All laboratories that use biological materials/agents are required to have a sign posted on entrance doors indicating the appropriate biological level. Signs are available from the Biosafety Program.	*
Other Bio. Safety Finding (see details):	BS-99	Biosafety	See finding details or ask your EHS DLC Coordinator for more information.	
Improper storage location	CS-1	Chemical Storage & Use	Please describe other improper chemical storage location findings	

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Liquid chemicals stored on the floor without secondary containment	CS-1-1	Chemical Storage & Use	Liquid chemicals stored on the floor must be in appropriate secondary containment. Containers on the floor must be appropriately placed, e.g. not in high traffic areas or blocking egress paths, to minimize the possibility of damage to the container. Chemicals that remain in their original DOT packaging do not need secondary containment.	
Excessive chemicals stored on benchtop	CS-1-2	Chemical Storage & Use	Avoid storing chemicals on the benchtop unless for daily use. They should be put back on the shelf or in the chemical cabinet after work.	
Liquid chemicals stored above eye level/on top of refrigerator / freezer / equipment	CS-1-3	Chemical Storage & Use	No corrosive, toxic, reactive or flammable liquids should be stored where it is difficult for any member of the lab to reach without having a clear view, i.e. eye level, because of the risk that the container could be dropped during handling, presenting a significant hazard. In addition, potential problems with containers, e.g. leaking or damaged, may be obscured when the hazardous liquids are not in clear view. No chemical should be stored on top of a refrigerator, freezer, or other equipment because of high risk for dropping and spill.	
Chemicals in egress corridor	CS-1-4	Chemical Storage & Use	Storage of chemicals in egress corridors may block the evacuation path or result in spills or be knocked over. In addition it will expedite the unauthorized access. Instead, they must be kept inside the chemical cabinets and shelves.	
Chemical containers in sink basin or inside the sink cabinet	CS-1-5	Chemical Storage & Use	Chemicals stored in the sink basin or inside the sink cabinet may cause spills in drain, violent reaction with oxidizers (such as bleach), and/or reaction with water. Bleach, household cleaners and alcohol based disinfectants can be stored in sink cabinet if they are properly segregated, i.e. using distance or secondary containment.	
Acids and oxidizers inside the flammable cabinet	CS-1-6	Chemical Storage & Use	Acids should be stored in acid cabinets or segregated by distance and secondary containment. Oxidizers must be segregated from flammables (cut off or detached storage). Please search for EHS-0023 (Chemical storage SOP) at EHS website EHS.MIT.EDU	
Flammable materials not stored in an FM or UL approved flammable storage cabinet	CS-1-7	Chemical Storage & Use	It is necessary to store flammable materials in FM (Factory Mutual) or UL (Underwriters Laboratories) approved flammable cabinet.	
Excessive chemical storage inside the fume hood / Biosafety cabinet	CS-1-8	Chemical Storage & Use	Chemicals should be kept outside of fume hood / Biosafety cabinet after preparation.	
Storage of temperature sensitive flammable materials in improper refrigerator / freezer	CS-1-9	Chemical Storage & Use	Flammable chemicals with a flashpoint of 140 °F or less (identified by with GHS flame pictogram) and temperature sensitive must be stored in a flammable storage refrigerator labeled with UL or FM approved label. Flammables in a regular refrigerator can present a fire hazard because of ignition sources in the refrigerator and potential for build-up of flammable vapor in the confined, unventilated location. Refrigerators can become contaminated with chemicals and cause odors	
Chemicals with significant odor stored in unvented cabinet	CS-1-10	Chemical Storage & Use	Odorous chemicals, like Thiols, should be stored in a flammable cabinet connected to dedicated exhaust ventilation according to NFPA standards to remove the odors. As an alternative, VOC vapors filter (Vaportrap™) can be used.	
Volatile chemicals and compressed gases stored in cold room or constant temperature room	CS-1-11	Chemical Storage & Use	Volatile hazardous materials and compressed gases must not be stored in a cold room or constant temperature room. Since cold rooms do not have a good air exchange and have ignition sources, storage and potential use of volatile hazardous materials in these rooms creates significant risk of a toxic, corrosive or flammable environment as well as oxygen depletion hazard. Storage of corrosives can damage the cold room equipment and infrastructure.	
Poor chemical storage practices	CS-1-12	Chemical Storage & Use	The chemical storage area should be large enough, cleaned and organized.	
Improper chemical labeling	CS-2	Chemical Storage & Use	Describe other issues pertaining to improper chemical labeling	

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Chemical containers without label / legible label	CS-2-1	Chemical Storage & Use	Labels for all containers, including containers of non-hazardous materials, must identify contents of container and be legible. -For materials generated in the lab, the label must also contain the generator's name or initials and date generated. -Labels must be firmly affixed to container. -Small containers of chemicals can be labeled in groups by labeling an outer container. -Secondary containers including wash bottles, falcon tubes, lab glassware contain chemicals must have the name of chemical(s) or recognizable code. -For shops, working containers that are not the original container for a product (secondary containers) must be labeled with product name and hazard, as found on the original label. For more information search for EHS-0016 at EHS website: EHS.MIT.EDU	
Chemical container missing labeling code or code not posted	CS-2-2	Chemical Storage & Use	Codes and abbreviations may be used, but all members of the lab need to know either what the code or abbreviation means, or where to access the key to the code. The key must be in a prominent location.	
Incompatible chemicals not properly segregated	CS-3	Chemical Storage & Use	Detailed guidance for compatible storage can be found in the SOP Chemical Storage. Segregate incompatible chemicals using one of these techniques: 1. Segregated storage: using distance, inert materials or secondary containment to segregate the incompatible chemicals 2. Detached storage: Storage areas are isolated by a protective wall 3. Cut-off storage: Storage in separate cabinets. The greatest concern is with liquids, but solids and liquids together also should be evaluated for compatibility issues. Examples of incompatible materials include: -Flammable material stored with Oxidizers -Acids stored with Bases without secondary containment -Acids and bases stored together (They can be stored in one cabinet IF they are protected by secondary containment) -Anhydrides stored with other chemicals (Anhydrides should be separated from all other materials wherever they are stored using secondary containment. Different anhydrides should be stored separately from each other. Example: Acetic anhydride, trichloroacetic anhydride -Organic chemicals stored with oxidizing chemicals (Example: Acetone with hydrogen peroxide) -Water reactive materials stored near liquids (Strong reactions) For more information search for EHS-0023 at EHS website:EHS.MIT.EDU	
Secondary containment in poor condition	CS-4	Chemical Storage & Use	Secondary containment should be used to isolate incompatible materials where space is limited for separate storage. The integrity of the secondary container is essential. Secondary containment should not be cracked or deformed.	
Chemical container in poor condition	CS-5	Chemical Storage & Use	Chemicals must be stored compatible containers that are in good condition with lids tightly closed. Containers shall not be corroded, bulged, rusted, punctured, cracked or squeezed. Chemical changes include gas accumulation, discoloration, unexpected color change, crystal deposits on the container walls, and white residue around the neck or lid. All chemical containers shall be stored in a safe upright position inside the chemical shelves and cabinets. They shall not be stacked on top of each other. Chemical containers shall be intact without any leak or damage.	
Improper setup of flammable storage cabinets	CS-6	Chemical Storage & Use	Describe other improper setup of flammable storage issues. Flammable storage cabinet's doors shall be completely closed all the time. Flammable storage cabinet shall be labeled in conspicuous lettering, "Flammable - Keep Fire Away." If a storage cabinet is not ventilated, the vent openings shall be sealed with the bungs supplied with the cabinet.	

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Improper storage and management of peroxide formers	CS-7	Chemical Storage & Use	All peroxide formers should have received date and an opened date once opened. If there is any evidence of possible crystals forming or particles in a container or around the cap of a peroxide former, contact EHS immediately. For more information search for for EHS-0042 (Peroxide-forming Chemicals, testing procedure and disposal) at EHS website: EHS.MIT.EDU	*
Hydrofluoric Acid not properly managed	CS-8	Chemical Storage & Use	The appropriate PPE for HF include acid-resistant apron with sleeves, goggles, faceshield and protective gloves (neoprene for long-term or nitrile for short-term work). Never use latex. Spill X A is ok for HF Spills, not Spill-X-C or Spill-X-S. The compatibility of sorbent with HF should be determined. Contact EHS for HF spill kit. HF training is required for all users in lab before using HF. It is recommended as a good practice to label the fume hoods, storage area or working area with HF caution signs.	*
Calcium gluconate is not provided or expired	CS-8-1	Chemical Storage	A tube should be kept in all labs that use HF. Make sure it has not expired. New tubes can be obtained from EHS.	*
The chemical inventory is not available or updated	CS-9	Chemical Storage & Use	It is required to maintain a chemical inventory for lab. The use of MIT's centrally provided chemical inventory platform is strongly recommended.	*
Lab members not aware of how to access Safety Data Sheets(SDSs)	CS-10	Chemical Storage & Use	Persons working in lab or shop should know how to quickly obtain the SDSs for chemicals. In shops, where the number of chemicals is usually limited, it is recommended to keep all updated SDSs in a Hazcom binder. SDSs can be obtained from a variety of sources such as internet, chemical manufacturer, or by contacting the EHS Office for assistance.	*
Designated highly toxic chemicals (Restricted chemicals) are not secured	CS-11	Chemical Storage & Use	Designated highly toxic chemicals (restricted chemicals) must be properly secured in labs and access to them must be restricted. These chemicals include but are not limited to, Arsenic trioxide, Chlorine, Hydrogen cyanide, Phosgene, Nitrous oxide, Potassium cyanide, Sodium cyanide, and Sodium arsenate. Refer to MIT Chemical Hygiene Plan template.	
Serious chemical management issues	CS-98	Chemical Storage & Use	Multiple findings in single storage location need a significant chemical management approach. In such situation, the problem must be discussed in a lab meeting and appropriate corrective action must be taken accordingly.	*
Other chemical management issue	CS-99	Chemical Storage & Use	This category may be used only if there is a finding which will not fit with any of other codes.	*
Compressed gas cylinders or cryogenes were not properly secured or located	CG-1	Compressed Gas & Cryogen Safety	Describe other gas cylinder securing issues.	
No cylinder restraint present or ineffective restraint	CG-1-1	Compressed Gas & Cryogen Safety	Standing cylinders are properly restrained when a tight, sturdy chain or belt restraint in good condition is used around the body of the cylinder above the center of gravity (about 2/3 of the way up the cylinder) at all times, including when empty. It is especially important that when chains (1/4 inch link recommended) are used there is minimal slack present. If the restraint is not tight or is too low on the cylinder, a cylinder may tip with enough force to break the restraint. Wherever feasible, cylinders should be restrained individually, by use of a separate restraint system for each cylinder. Dont exceed the number of cylinders the restraint was designed for. This guidance applies to cylinders of all sizes. Alternatively, other means of restraint such as a gas cylinder stand may be used.	
Cylinder(s) stored on a hand truck or cart	CG-1-2	Compressed Gas & Cryogen Safety	Storing cylinders on a hand truck or cart is not an acceptable storage method and the cart should be used for transport only. Alternatively, a gas cylinder stand designed for holding cylinders may be used.	
Gas Cylinders or cryogenes located in a corridor or other public/ inappropriate area	CG-1-3	Compressed Gas & Cryogen Safety	Building code and fire regulations prohibit the storage of compressed gas cylinders or cryogenes in egress corridors. Cryogenes should be stored in locations with adequate ventilation.	
No designated area for pick-up or delivery of gas cylinders	CG-1-4	Compressed Gas & Cryogen Safety	Our gas supplier has requested that labs have a designated area where cylinders can be picked up or dropped off. In addition, cylinder tags should be clearly labeled empty or ready for pick-up.	

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Compressed gas cylinders or gas piping were not properly labeled or label(s) not visible	CG-2	Compressed Gas & Cryogen Safety	Compressed gas cylinders should be oriented whenever possible so that the manufacturer label is clearly visible. Longer runs of gas piping and piping between rooms should be labeled. Key areas include adjacent to valves and near wall or floor penetrations. All cylinders should have status tags indicating whether the cylinder is full/in use/empty. The ANSI/ASME A13.1 standard contains guidance for pipe marking and is referenced by OSHA. It states that labels should be placed on pipes: Adjacent to all valves and flanges Adjacent to all changes in pipe direction On both sides of wall, floor or ceiling penetrations Every 50 feet on straight runs of pipe (or every 25 feet in congested areas)	
Gas piping, regulators or other components in poor condition, incompatible or not appropriate for use	CG-3	Compressed Gas & Cryogen Safety	Dented, rusted or otherwise damaged regulators should be replaced or serviced. The regulator should be appropriate for the gas and the cylinder and delivery pressure. Teflon tape is only needed on tapered fittings, where the threads form the seal. The tubing should be appropriate for the gas being used. -Oxygen service requires a specialty regulator and piping. If you are unfamiliar with gas piping and components refer to the EHS Compressed Gas SOP and consult with knowledgeable personnel.	
Gas piping, regulators or other components not leak checked	CG-4	Compressed Gas & Cryogen Safety	All gas delivery system components should be leak checked prior to use. This is especially critical for high pressure, toxic or flammable gases. For these higher hazard systems ask the EHS rep researcher if the system is leak checked on a regular basis and whenever changes are made to the system. A tag or log is helpful in determining when the system was last leak checked. An SOP is recommended for higher hazard systems.	
Appropriate PPE not available where cryogens are transferred or handled	CG-5	Compressed Gas & Cryogen Safety	Typical PPE to protect personnel from the thermal hazards of cryogenics includes loose fitting cryogen gloves and face shield/safety glasses, lab coats, cryo aprons or other protective clothing may be necessary depending on cryogen amount and the potential for splashes.	
Gas monitoring system not present or functioning properly	CG-6	Compressed Gas & Cryogen Safety	EHS should be involved in the design and installation of gas monitoring systems. A program should be implemented for periodic maintenance and calibration of all detectors and testing of alarm systems according to the manufacturer's recommendations. This requirement should include any local or portable alarm systems. Any malfunctions or deficiencies should be addressed immediately.	*
Toxic or flammable gas monitoring system (TGMS) not present or functioning properly	CG-6-1	Compressed Gas & Cryogen Safety	Toxic gas use that occurs outside of a fume hood and/or with quantities greater than those in a lecture bottle requires a Toxic Gas Monitoring System (TGMS). Monitoring for flammable gases may be required based on a risk that evaluates quantity, location, equipment.	*
Oxygen monitoring system not present or functioning properly	CG-6-2	Compressed Gas & Cryogen Safety	Oxygen monitors are required when the possibility of a low oxygen atmosphere exists due to limited ventilation, room size or potential for a large release. Since the sensors for most oxygen monitors use fuel as they operate, they may last only 12 to 18 months. When the sensors are spent, the monitor output, which is normally 20.9%, will drift and attempts to calibrate the monitor may fail.	*
Other Compressed Gas & Cryogen Safety Finding (see details)	CG-99	Compressed Gas & Cryogen Safety	See finding details or ask your EHS DLC Coordinator for more information.	
Chemical waste containers were not firmly closed.	SAA-1	Satellite Accumulation Area	Chemical waste containers must be firmly closed except when waste is being added to the container. A container is considered closed if material will not pour out if the container is tipped and vapors are controlled. Pressure relieving caps should be used for hydrogen peroxide and wastes which may continue to react and generate pressure. If attached funnels are used, they must be liquid tight and have closed covers. Reference: 40 CFR 265.173	

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Multiple waste containers of a single waste stream were within an SAA.	SAA-2	Satellite Accumulation Area	Hazardous waste regulations permit only one active container of hazardous waste per process in a given SAA. Once the active container is filled and dated, a second container of the same waste stream can be started. The full container must be removed from the SAA within 3 days. (The three day issue for full containers is dealt with in SAA5). The container size cannot exceed 55 gallons for hazardous waste and 1 quart for acutely hazardous waste. If full containers are noted in an SAA check the date and ensure that a request for pickup has been generated online at the MIT EHS website or by calling the MIT EHS office at x2-3477. Reference: 310 CMR 30.340(6)(c) and Fact Sheet published by the MA DEP in September 2005	
Chemical waste containers were inappropriate or in poor condition.	SAA-3	Satellite Accumulation Area	Chemical waste containers should be of seamless construction and not cracked or otherwise damaged. Typically, triple- rinsed glass or plastic bottles of various sizes are used, with original labels removed or fully obscured. Containers must have lids that are in good condition. Venting or pressure relieving covers should be used for wastes which may continue to react and build pressure. Obviously inappropriate containers, such as makeshift containers, food containers, etc., should not be used. Containers must be compatible with the waste stored in them, e.g. Hydrofluoric acid should not be stored in glass container, corrosives not in metal containers. (Chemical compatibility tables and charts are available for basic and common questions where chemicals are stored. See: EHS.MIT.EDU, then search on 'Compatibility') Reference: 310 CMR 30.340 and 30.253	
Tags or labels on chemical waste containers were missing, incomplete, inaccurate or not legible.	SAA-4	Satellite Accumulation Area	The red "Hazardous Waste" tags must be properly completed with the following information: Name of chemical(s) printed legibly in English without abbreviations or chemical formulas. The applicable hazard characteristic(s) checked, i.e. ignitable, corrosive, reactive, and/or toxic. The building and room where the waste was generated. The generator's name, i.e. the name of the person responsible for creating the specific waste stream. The name of the Principal Investigator/Supervisor overseeing the activity resulting in the hazardous waste generation. Once a container in a SAA is or nearly full, e.g. to the bottle shoulders, the date must be written on the label. Red hazardous waste tags are available from the MIT EHS Office. Reference: 40CFR262.34 and 310 CMR 30.341	
Dates on labeled containers with the SAA were over 3 days old.	SAA-5	Satellite Accumulation Area	All containers, full or otherwise ready for collection must be dated. Once dated, they can be kept in an SAA for a maximum of three days. Then they must be removed to a Main Accumulation Area (MAA). Reference: 310 CMR 30.340	
The label identifying the SAA was missing.	SAA-6	Satellite Accumulation Area	MIT requires that a green sticker that reads "HAZARDOUS WASTE SATELLITE ACCUMULATION ONLY" be used at each SAA to meet Environmental Protection Agency (EPA) requirements. This sticker should be readily visible on the secondary containment(s) or the immediate area to be used as an SAA. Other signs are not acceptable. Note: Green-and-white barber pole tape is used for Main Accumulation Areas (MAA). Reference: 40 CFR 260	
Incompatible wastes were not properly segregated.	SAA-7	Satellite Accumulation Area	Incompatible wastes cannot be stored in the same secondary containment, so that in the event of commingling (from breakage or other localized spill or release) there will be no reactivity issues. Reference: 40 CFR 264.	*

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There was lack of appropriate secondary containment.	SAA-8	Satellite Accumulation Area	All chemical waste containers must be provided with secondary containment that is free of cracks or other damage. The MIT Environmental Management Program (EMP) provides and/or approves secondary containment for all hazardous waste storage areas. Reference: 40 CFR 264.175	
The SAA location was not appropriate.	SAA-9	Satellite Accumulation Area	SAA's must be located near the point of waste generation. For example, if the generator has to go through a hallway or other public access area to get to his/her hazardous waste accumulation area, it cannot be considered at or near the point of generation. SAA's should not be near drains, sinks, or at locations where an accidental release could create a "release to the environment" such as near a sump pump or an unpaved or non-impervious areas (e.g., broken concrete floor). Reference: 310 CMR 30.340 and 40 CFR 260	
Hazardous waste was kept outside a properly marked SAA.	SAA-10	Satellite Accumulation Area	Hazardous waste must be kept in a properly marked SAA. Reference: 310 CMR 30.340 and 40 CFR 260	
Non-waste materials were kept in an SAA.	SAA-11	Satellite Accumulation Area	Hazardous waste and only hazardous waste must be kept in a properly marked SAA.	
SAA(s) was (were) not inspected weekly.	SAA-12	Satellite Accumulation Area	SAA's MUST be inspected weekly, though documentation of the inspection is not required. If weekly inspections are being done by users, problems should be minimal. Ask whether inspections are occurring and check the response against conditions you observe. Reference: 310 CMR 30.686 and 40 CFR 260	
Multiple findings were identified in an SAA area (see details):	SAA-98	Satellite Accumulation Area	Multiple findings were identified in a single SAA (see details).	*
Other SAA Finding (see details):	SAA-99	Satellite Accumulation Area	See finding details or ask your EHS DLC Coordinator for more information.	
Radioactive Material Inventory and/or Use Logs were not up to date.	RS-1	Radiation Safety	Maintenance of the records is a requirement of the authorization that permits the use of these radioactive materials. All sources of radioactive material are inventoried when delivered to the laboratory. The inventory and use records track the receipt, use and user of the material. The state of Massachusetts Radiation Control Program requires that all sources of radiation are controlled and accounted for. Reference: Massachusetts Department of Public Health 105 CMR 120	
Radioactive Material waste inventory cards were improperly filled out.	RS-2	Radiation Safety	All radioactive waste disposal must be recorded by user at the time of disposal. The state of Massachusetts Radiation Control Program requires that all sources of radiation are controlled and accounted for. Reference: Appendix 3 of the MIT Required Procedures for Radiation Protection Manual. Reference: Massachusetts Department of Public Health 105CMR120	*

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Stock radioactive material was not secure.	RS-3	Radiation Safety	All stock radioactive materials must be secured from unauthorized removal or access. Examples are a lock box, locked refrigerator or with an authorized user of radioactive material. The State of Massachusetts Radiation Control Program states that the licensee shall maintain constant surveillance and use devices or administrative procedures to prevent unauthorized use of licensed radioactive material that is in an unrestricted area and that is not in storage. Reference: Massachusetts Department of Public Health 105CMR120	*
Survey meter was out of calibration or not working.	RS-4	Radiation Safety	All survey meters must be calibrated and in proper working condition. The yellow sticker indicates the calibration date and due date for the next calibration. The RPP calibrates the meter twice a year. Meters with low voltage batteries may under respond or even not respond to radiation. The State of Massachusetts Radiation Control Program requires that the survey meter must be working and calibrated annually. Reference: Massachusetts Department of Public Health 105CMR120	*
Radioactive Material sign not posted.	RS-5	Radiation Safety	Radioactive Materials Caution Signs are posted at doorways by RPP. Radioactive material users label their own areas, equipment and containers. Contact RPP if a sign is missing or radioactive material is used in a non posted room	
Other Radiation Safety Finding (see details):	RS-99	Radiation Safety	See finding details or ask your EHS DLC Coordinator for more information.	
Fume hood housekeeping was poor and/or had excessive clutter.	HS-1	Hood Safety	Fume hoods should not be used as a storage area for chemicals, lab supplies and equipment that could be located elsewhere. Enough space should be available and equipment located so that chemical work can be conducted 6 inches back from the front of the fume hood. Hood surfaces must be kept clean. Nothing should protrude through the sash opening large enough to obstruct or disrupt airflow.	
The back slot of the fume hood was greater than 50% obstructed.	HS-2	Hood Safety	The back bottom slot of the fume hood must not be >50% obstructed within 6 inches of the slot. Obstruction of airflow can occur, creating turbulence and affecting containment. Obstructing equipment or materials should either be moved or mounted on small blocks or equipment grids, which will allow the air to flow under.	
The back slots of the fume hood needed cleaning.	HS-3	Hood Safety	If the back slots of the fume hood have become sufficiently clogged with dust or debris to affect airflow, users must clean them using a wire brush.	
The fume hood had not been inspected or tagged by EHS within the last year.	HS-4	Hood Safety	The EHS Industrial Hygiene Program (IHP) surveys all chemical hoods yearly to ensure that they are operating at their performance specifications. The MIT IHP sticker could be on either side of the hood where the sash slides and contains information on air velocity at the hood face, room and hood number, and survey date. If the hood is only effective to a specified sash height the sticker will indicate this. If the survey date is more than a year ago, you should notify the lab occupants and IHP. The inspection team or lab group should also contact IHP if they have questions or concerns.	*
Other Hoods Finding (see details):	HS-99	Hood Safety	See finding details or ask your EHS DLC Coordinator for more information about additional issues. Some examples: Fume hood slot must not be adjusted by user. Lab ventilation system must not be altered. Low flow alarms must not be ignored or disabled.	
Area was not posted with the appropriate 3b/4 laser sign.	LS-1	Laser Safety	A laser warning sign is posted by RPP where class 3b or class 4 open beam lasers are used. Requirements are described in the Laser Safety Manual. Signs are available from the Radiation Protection Program.	
A lighted 3b/4 laser warning sign was not installed outside room.	LS-2	Laser Safety	A lighted warning sign is required for an operational, class 3b or class 4, open beam laser system. The lighted warning sign is to be interlocked with the laser system power supply. RPP may allow a non- interlocked, administratively controlled lighted warning sign on a case-by-case evaluation. Lighted warning signs are available from the RPP.	*
Class 3b/4 laser SOP was not posted.	LS-3	Laser Safety	The required user-written SOP for either the class 3b or class 4 lasers must be posted. Reference: The MIT Laser Safety Manual.	

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Appropriate eyewear for laser was not available or not intact.	LS-4	Laser Safety	<p>Intact, non-damaged, appropriate laser eyewear must be available for all persons where class 3b or class 4 lasers systems are in use.</p> <p>The Radiation Protection Program can provide guidance on the specific eye protection requirements for the laser system being used. All laser eyewear will have ANSI approved wavelength protection information printed on the eyewear.</p> <p>Reference: Massachusetts Department of Public Health 105 CMR 121 Regulations for the Control of Lasers regulates the use of the laser systems, devices or equipment to control the hazards of laser rays or beams. The MIT Laser Safety Program and the MDPH regulations are based on the requirements set forth in the most recently published version of the ANSI Z136.1 standard.</p>	*
Class 3b/4 laser was not registered with the Radiation Protection Program (RPP).	LS-5	Laser Safety	<p>RPP places a Laser Registration sticker on devices registered.</p> <p>Requirements for the registration of class 3b and class 4 lasers are described in the MIT Laser Safety Program manual. Registration may be done online. See EHS.MIT.EDU (Radiation Protection)</p> <p>Reference: Massachusetts Department of Public Health 105 CMR 121 Regulations for the Control of Lasers regulates the use of the laser systems, devices or equipment to control the hazards of laser rays or beams. The MIT Laser Safety Program and the MDPH regulations are based on the requirements set forth in the most recently published version of the ANSI Z136.1 standard.</p>	*
Other Laser Finding (see details)	LS-99	Laser Safety	See finding details or ask your EHS DLC Coordinator for more information	
Personal Protective Equip. (PPE) (PPE) suitable for the hazards in the workplace was not available, stored appropriately, and/or maintained in generally good condition.	PPE-1	Personal Protective Equipment	<p>All PPE must afford effective protection against the type of hazard present in the workspace, must fit and be worn properly, and must be stored and maintained so that the PPE does not become contaminated or exhibit wear and tear that diminishes its protective features. PPE includes protective headgear, earphones and earplugs, gloves (chemical, cut- and heat/cold resistant), safety shoes/foot protection, respirators/masks, safety glasses/goggles/face shields, and any special clothing specifically designed to protect the limbs and body from chemical, biological, ionizing radiation, non-ionizing radiation and fields, lasers, and other physical hazards. Since disposable PPE is not designed for repeated use, it must not be reused, since pinhole tears and other failures not visible to the naked eye may develop. Instructions for obtaining PPE, as well as a PPE hazard assessment form, are available at: EHS.MIT.EDU (search on PPE). OSHA law requires MIT (or your employer if not MIT) to provide PPE free of charge, provided the PPE is not used as street clothes.</p>	*

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Laboratory/shop personnel were not wearing eye protection, lab coats, gloves and other appropriate PPE.	PPE-2	Personal Protective Equipment	<p>Laboratory/shop personnel must wear appropriate PPE.</p> <p>Eye Protection: OSHA, along with several MIT policies and programs, requires employers to provide employees with appropriate eye protection, and identifies classes of hazardous activity where eye protection may be necessary. Potential eye hazards include: biological, radiological, or hazardous chemical material/waste handling; laser work; ultraviolet light sources; certain light-generating activities (e.g., welding); and, activities generating airborne debris that can cut or abrade eye tissue. Many DLCs require eye protection at all times, and post "Eye Protection Required" signs in designated areas. Appendix D of the EHS SOP "Personal Protective Equip. (PPE)" provides guidance on eye protection selection. Appendix E of the SOP provides instructions on ordering prescription safety glasses.</p> <p>Protective Clothing: Protective clothing includes lab coats, Tyvek coveralls, jackets/aprons, and any special jackets/shirts/pants designed to provide a level of protection against workplace hazards or special clothing/uniform that is not worn outside the workspace. Work with hazardous substances requires that personnel wear laboratory coats with long sleeves, long pants (trousers) or long skirt that cover your legs and shoes (no open toed shoes or shoes made of woven material) that cover your feet. Lab coats are required for Biosafety Level 2 (BL2) laboratories and are highly recommended for Biosafety Level 1 (BL1) laboratories. Appendix A of the SOP "Personal Protective Equip. (PPE)" provides guidance on selection of protective clothing appropriate to the hazard, further guidance can be found on the EHS webpage specifically - Lab Coats, Smocks and Coveralls with additional links to a Lab Coat webpage. Information is also contained in the MIT Chemical Hygiene Plan template.</p> <p>Gloves: General guidance is given here for chemical and biological hazards. Select and wear appropriate hand protection, generally gloves, to prevent injury to hands or exposure by absorption of chemicals through the skin of the hands. Gloves for work with chemicals must be selected based on the potential contact hazard, and the permeability of the glove material. For incidental skin contact with small amounts of chemicals on a surface, or work with most powders, disposable nitrile gloves are usually adequate. For work involving materials that are readily absorbed through the skin, the glove must be carefully selected using glove impermeability charts. Silver Shield brand gloves work well for many common laboratory chemicals that can be absorbed through the skin, but you should verify their effectiveness for your application. You should also evaluate need for hand protection from physical hazards such as extreme heat or cold, and make sure you use appropriate gloves. Gloves are required for all work with all potentially infectious biological materials. Appendix C of the SOP "Personal Protective Equip. (PPE)" provides guidance on the appropriate selection of gloves.</p> <p>Head/Foot Protection: Hardhats bump hats, helmets, and safety shoes are generally required where overhead obstructions or objects, falling/sharp objects, or chemical or electrical hazards may result in injury to the head or feet. Safety shoes are rated, and must be selected to the hazards present (falling/sharp objects, hazardous chemicals, water/electrical resistance).</p> <p>Hearing Protection: If you are unable to hear someone speaking at a normal volume that is within 2 feet of distance from you- that area may be above 85 db. EHS stocks both ear muffs and ear plugs for DLC's to purchase. Contact EHS for advice on selection and care of hearing protection and to conduct noise monitoring.</p> <p>Respiratory Protection: Addressed in guidance for PPE-3. Note: MIT has a formal written Respiratory Protection Program and guidance materials which may be accessed at EHS.MIT.EDU search on respiratory protection. Reference: OSHA 29CFR1910.133 and OSHA Lab Standard 1910</p>	
Respiratory protection was not appropriate, maintained or stored properly.	PPE-3	Personal Protective Equipment	<p>Respirators must be stored in an area with a relatively consistent temperature and humidity and away from direct sunlight in order to remain in good, usable condition. Generally, it's good practice to keep respirator facepieces in their original bags or cases. Respirators must NOT be hung by the headstraps for storage – this can stretch out the headstraps and potentially warp the mask. Heavy items like books and tools should not be stored on top of respirators. Finally, respirators must be kept in a clean, relatively contaminant-free environment. Exposure to contaminants can not only degrade certain respirator parts but can also lead to the premature expiration of respirator filters and cartridges.</p> <p>Proper respirator care and storage will generally facilitate proper respirator maintenance. Respirators should be clean and free from visible damage (warping, cracking, tears, rusting). Headstraps should have plenty of elasticity. The view lens should be clear and free from cracks and excessive scratches. Finally, the valves (both inhalation and exhalation) should still be flexible, free of cracks and warping, and moving freely without sticking.</p>	

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Respirators are being used without an EHS evaluation and approval.	PPE-4	Personal Protective Equipment	<p>All respirator users must consult with EHS and MIT Medical before using a respirator even if they use it voluntarily. Voluntary use of respirators is defined as respirator use when exposure potential is low but an individual conservatively elects to use a respirator (respirator is not required for protection).</p> <p>In this section, the word "respirators" refers to any tight-fitting respiratory protection device (i.e., air-purifying respirators, supplied air respirators, and filtering "facepieces/dust masks").</p> <p>EHS keeps paperwork on file that confirms whether a medical evaluation and fit test(s) have been performed for a specific individual</p> <p>Reference: OSHA 29CFR1910.134</p>	*
Other PPE Finding (see details):	PPE-99	Personal Protective Equipment	See finding details or ask your EHS DLC Coordinator for more information.	
Extension cords were not used properly (e.g., daisy chained, used in place of permanent wiring)	ES-1	Electrical Safety	<p>Extension cords (including power strips) are not to be used as a substitute for the fixed wiring of a structure. Extension cords are prohibited for equipment in continuous service, with the exception of computers. Computer peripherals are not exempt. Cube taps (outlet multipliers) should not be used. Strip outlets with overload protection may be used, but only with low-amperage devices, and within the capacity of the strip. Grounding plug adapters should not be used. Nearly all electrical outlets are three-prong type; therefore, this will unlikely be seen at MIT.</p> <p>Cords and cord-use applications must be evaluated based on the following criteria:</p> <p>Grade of the cord: It should be of commercial grade and in sound, non-compromised condition. Shop-made cords or any non UL or ANSI cords must not be used. Commercial-grade cord sets will have an outer cover enclosing the inner conductors (which themselves are insulated). Narrow gauge home-use types are not acceptable in most applications. Actual reading of the classification of the cord is not necessary, but it should be evident that the cord is of reasonable quality and durability.</p> <p>Placement of the cord: The cord must not be draped over, on or under objects which crimp, crush, or cut the cord or conductors within. The cord must not cause a trip hazard. Cords should not be used in series.</p> <p>Devices served by the cord: Use of high-demand devices (which draw high current/amperage) for long periods, such as resistance heaters, broilers, large motors, air conditioners, compressors, etc., should be more closely evaluated as to whether they exceed the rated capacity of the cord. These devices generally have specific restrictions on length and gauge of cord required, if an extension cord is used. Manufacturers of certain high-demand devices prohibit the use of extension cords.</p> <p>Simpler devices such as computers, monitors, simple light fixtures, radios, small electronics, etc., are less likely to draw current that will exceed commercial extension cords. The distinction regarding these devices requires that knowledge and judgment be used in the assessment process.</p> <p>If an application is encountered that is clearly questionable, but is not readily or confidently answered, it should be flagged for further evaluation. For example, if a large refrigerator is temporarily being run from heavy-gauge but relatively long extension cord you will not be able to determine if the length for the gauge is adequate. This should be noted as an item for further investigation but not a finding.</p> <p>Reference: OSHA 29 CFR 1910.305 and EHS SOP Guidelines for Inspecting Extension Cords</p>	
Electrical equipment, cords, plugs and wiring were not maintained in good condition.	ES-2	Electrical Safety	The cord and plug must be in good condition, free of splits, cracks, or derangement. Repairs to cords are generally not acceptable unless it returns the cord to its original level of continuity; this requires some judgment. Generally, flimsy repairs or many repairs (to the same cord set) are not acceptable.	

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An appropriate High Voltage warning sign was not posted.	ES-3	Electrical Safety	High voltage warning signs required for voltages equal to or greater than 600 volts. Reference: OSHA 29 CFR 1910, Subpart S	
Access to an electrical panel was obstructed.	ES-4	Electrical Safety	Access to electrical panels needs to be unobstructed to allow for quick access in the event of an emergency if power needs to be de-energized. A minimum of 36 inch working clearance in front of electrical panels is required and the working space may not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be suitably guarded Reference: OSHA 29CFR1910.303 527 CMR 12.00	
An area where wet conditions are anticipated was not protected by a Ground Fault Circuit Interrupter (GFCI).	ES-5	Electrical Safety	Ground Fault Circuit Interrupters (GFCI) are required for any area where wet conditions are expected or anticipated nearby; this would include bathrooms, janitors closets, outlets near sinks of any kind or wet process areas. Any workplace or work classification that comprises non-fixed, non-standard activities should be considered as a construction activity. For construction activities, all portable and temporary electrical devices are required to be used with a GFCI A GFCI is a device intended for the protection of personnel that functions to de-energize a circuit within an established period of time when a current to ground is 6 mA or higher. GFCIs can be the outlet itself or at an outlet downstream of a number of outlets on the same circuit or at the breaker panel. It is harder to verify the breaker panel as being GFCI protected as you usually have to look at the breaker itself. Sometimes outlets that are protected at the breaker are so indicated as GFCI protected. If you are not sure contact the Department of Facilities. GFCIs can also be present as an adapter or as part of an extension cord. GFCIs work with two or three prong plugs. Reference: OSHA 29 CFR 1910, Subpart S	*
Exposed electrical components were observed.	ES-6	Electrical Safety	Electrical wiring, terminals, connectors and other components should be run thorough conduit, insulated, isolated or guarded to prevent inadvertent contact or keep personnel at a safe distance. Lab wired experiments or apparatus should be reviewed by qualified personnel.	*
Portable electric tools and equipment were not grounded/double insulated.	ES-7	Electrical Safety	All small, portable electrical devices must either have a three pronged cord, or be of "double insulated" design (two pronged plug). Generally this means that the housing and parts that the user touches are non-conductive (e.g. plastic) or that the internal conductors cannot contact the housing (shielded). The designation of "double insulated" is usually on the device. Nearly all UL approved devices are double insulated or have three-pronged plugs. Older, non-standard devices would be most suspect and should be checked. You can generally see that a plug is three-pronged by the shape of it, without unplugging the device. Generally you should not unplug devices to determine this. Reference: OSHA 29 CFR 1910, Subpart S	
Electrical service panel unlocked and/or missing panel cover.	ES-8	Electrical Safety	Only authorized persons are allowed access to electrical panel circuit breakers. A licensed electrician must inspect electrical panels to ensure they meet the following requirements: 1) Properly installed, 2) Properly maintained, 3) Equipment covers are in place and secured, and 4) there is no evidence of impending failure prior to the normal operation of a circuit breaker switch. If these conditions are not met, arc flash Personal Protective Equipment (PPE) is required. Reference: NFPA 70E article 130 – reference table 130.7(C)(15)(A)(a)	*
Other Elec. Safety Finding (see details):	ES-99	Electrical Safety	See finding details or ask your EHS DLC Coordinator for more information.	

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FINDING	Checklist #	Section	GUIDANCE	DCR (*)
Machine guarding was not present or was inadequate.	SS-1	Shop Safety	<p>Wherever possible, guards shall be in place during machine use. Guards must be securely attached to the machine at the point of operation (e.g. where the part or stock) meets the blade, drill, or cutter.) Also, don't forget to check for guards covering motors and drive assemblies that run the machines as these are often removed during service or repairs and not reinstalled when the job has been completed. Do a 360 degree walk around each machine to make sure that the front, back and side panels are in place. These panels generally act as guards for any moving parts (pulleys belts, etc.) located inside which drive the machine.</p> <p>Guards are intended to protect the operator as well as bystander(s) from flying particles (e.g. lathes, drill presses, grinders) nip points (e.g. grinders, shears) as well as rotating parts (e.g. belts/motors/pulleys) and cuts from blades (e.g. table saw, band saw, metal shears.)</p>	*
Chemical (product) list was unavailable or incomplete.	SS-2	Shop Safety	<p>There must be a list of chemicals used in the shop.</p> <p>The OSHA Hazard Communication Standards require that those working with potentially hazardous chemicals be informed of the hazards and measures established to protect them from those hazards.</p>	
SDSs were not readily accessible.	SS-3	Shop Safety	<p>Persons working in lab or shop should know how to quickly obtain an SDS for chemicals that are in the lab or shop. In shops, where the number of chemicals is usually limited, it is recommended that the SDSs be available in a notebook. A computer can be used if all in the shop can access the computer and find the SDS information readily.</p>	
Local ventilation was in need of evaluation.	SS-4	Shop Safety	<p>Machining/woodworking equipment may require ventilation. Evidence of inadequate ventilation includes large accumulation of dust on surfaces in area or accumulation of oily residual on surfaces for machining operations. Employees may also complain about breathing fumes/mists or bad odors from the processes they are doing.</p>	*
There was no current hot work permit, where required.	SS-5	Shop Safety	<p>Fixed locations, where hot work is routinely conducted, must be defined as Designated Hot Work Areas. These areas must be isolated by screens, walls or noncombustible partitions. Areas must be kept free of combustible materials and provided with exhaust ventilation to remove fumes and smoke.</p> <p>Hot Work Permits for Designated Hot Work Areas (such as welding shops,) must be issued, and renewed annually, by the MIT EHS Office.</p> <p>Reference: OSHA 29 CFR 1910.251 – 255 527 CMR 39.00 Hot Work Permit SOP, EHS-0058</p>	*
Stationary power equipment was not secured in place.	SS-6	Shop Safety	<p>Securing a machine is most often done by bolting it to the floor, bench top or wall. Not all machines need to be secured. According to OSHA, if the machine is equipped/constructed with features allowing it to be secured (bolt holes etc.) then it must be fastened to the floor or wall to prevent tipping, walking or creep. This can be interpreted to mean that a machine not equipped in this way is not required to be secured. However, if there is a risk of tipping, an alternate method to secure it may need to be implemented, such as the use of straps or other means.</p> <p>From a practical point of view, the inspections should focus on upright machines to determine if they are secured in some way, as these have the greatest potential to tip-over, especially when loaded with heavy parts or stock. Some typical examples of upright machines include pedestal mounted drill presses, band saws and grinders.</p>	
Emergency power cutoff switch not accessible or was not working.	SS-7	Shop Safety	<p>Machines should be equipped with an on/off button or panic button or kill switch within the operator's reach while at the machine. The operator should not have to leave a running machine unattended to turn off the power.</p>	*
Other Shop Safety Finding (see details):	SS-99	Shop Safety	<p>See finding details or ask your EHS DLC Coordinator for more information.</p>	

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FINDING	Checklist #	Section	GUIDANCE	DCR (*)
Other Finding (see details):	OTH-99	Other Findings	See finding details or ask your EHS DLC Coordinator for more information.	