Standard/Safe Operating Procedures for Moving Hazardous Materials and Waste

Revision Date: September 1, 2021

Unfinished. Elevator section is a draft pending actual elevator set

Introduction

The movement of hazardous materials (chemicals, radiological materials, biohazards) associated with receiving shipments or transporting chemicals from one location to another requires special handling to minimize risks. Safe practices for moving chemicals apply to whether chemicals are moved from one room to another within the same building, or between buildings on campus.

This Safe Operating Procedure applies only to transporting chemicals within the campus property and not crossing public roads.

1. Moving chemicals to another location

The act of transporting a hazardous substance comes with a risk of spills, heavy items falling on feet, shattered glass, and possible exposure to the public. For specialty items, such as compressed gas cylinders and cryogens, equipment designed to move them is available.

1.1 Hazard Review

Overturned carts, dropped containers, and people accidentally running into personnel while moving chemicals or hazardous waste from one location are common causes of spills. Unwanted chemical exposures, damage to floors, and unknown dangers from mixing of incompatible chemicals are examples of what can happen from such spills.

1.2 General Safe Work Practices

1. When transporting chemicals outside the laboratory or between stockrooms and laboratories, use only break-resistant secondary containment.
2. Check elevators for passengers when chemicals or hazardous waste must be transported between floors. Passengers are not allowed in the elevator while authorized personnel are moving chemicals between floors. Use the service elevator to transport hazardous materials.
3. Use re-sealable plastic bags or other secondary containment for small samples.
4. Use appropriate chemical transport carts when moving larger liquid containers, especially if made of glass.
5. If hand-carrying, use commercially available secondary containment made of rubber, metal, or plastic, with carrying handle(s), and is large enough to hold the contents of the chemical containers in the event of breakage.
6. Use white poly carts to move hazardous waste to the central hazardous waste storage shed. These are safer when rolling over asphalt outdoors.

1.3 Receiving Shipped Chemicals

Shipments of chemicals and other hazardous materials are delivered to the stockroom where there is a ramp. The stockrooms storage areas have been designed for the storage of flammable liquids and other hazardous materials.

1. Stockroom or lab staff receiving a shipment must be present when the chemicals are delivered
2. If the ultimate recipient or a representative is not present, do not leave the shipment in their lab or work area. Keep in secure storage in the stockroom until the recipient is available to receive it.
3. Do not leave chemicals in their shipping containers in labs or workshops for extended periods of time. Remove them from the shipping box, write the date received on each chemical container and put them in their designated cabinet or location.

1.4 Transporting Hazardous Materials or Waste within Buildings

Carts are available that are designed for transporting gas cylinders, gallon glass bottles, and other hazardous materials.

1. Use a cart designed for moving the type of material. For example, only use gas cylinder carts to move compressed gas cylinders.
2. Only use the white poly carts or the large metal carts with high sides and industrial wheels to transport liquid hazardous waste to the central 90-day hazardous waste storage area. These carts are not motorized.
   - These carts are heavy-duty and very stable even over rough ground. The wheels will not get stuck in elevator grooves.
   - Carts have high sides ~6" to contain any spilled or leaking material.
   - Use carts equipped with slots or holders for transporting liquids in 4L bottles. Some versions have adjustable inserts for larger containers.
   - Poly carts are equipped with a mechanical foot brake.
   - Using these will minimize the chance of overturning or of containers falling off.
3. Place containers such as bottles or bags on carts in a manner that prevents them from falling or sliding off.
4. Provide secondary containment for liquid chemical containers when transporting them through hallways and elevators.

1.5. Moving Cryogens

Cryogenic substances, such liquid nitrogen and carbon dioxide, can render the container brittle and easily breakable. Cryogens can freeze human tissue on contact resulting in chemical burns and possibly permanent damage.

General SOP: Transporting liquid nitrogen and other cryogens

1. Use containers designed for transporting cryogens.
2. If the dewar does not have wheels use a cart or other device to safely move the dewar.
3. Wear gloves designed to protect against cryogens and goggles to protect from possible over pressure valve activation.
4. Use the service elevator to transport cyrogenic liquids.
5. Place cryogenic liquid containers in the service elevator and send the car to the desired floor without the handler or other passengers in the car.

1.6 Moving Gas Cylinders

Protect the cylinder valve. Most of the handling rules are designed to prevent the valve from leaking or breaking.

General SOP: Transporting Gas Cylinders

1. Check that the receiving location is prepared to receive the cylinder(s).
   - If area doesn't have cylinder straps or chains in place, do not deliver it until they are in place.
   - Never leave unsecured gas cylinders unattended.
2. Screw on the protective cover cap. Do not move a gas cylinder with its regulator installed.
3. Strap the cylinder in a cylinder cart designed for this purpose.
4. When gas cylinders must be transported between floors, use the service elevator. Do not allow passengers other than the handler to be in the elevator.

1.7 Elevator Use When Transporting Hazardous Materials

1. Use the service elevator when possible.
2. The service elevator is restricted to staff and students who have been properly trained.
3. Only the individuals handling the hazardous materials are allowed in the elevator.

4. Check elevators for passengers when chemicals or hazardous waste must be transported between floors.
   - Passengers are not allowed in the elevator while authorized personnel are moving chemicals between floors.
5. Do not allow passengers to enter an elevator that is being used to transport chemicals or hazardous waste. Ask people to wait for the next elevator.
6. Do not transport hazardous liquids in containers larger than five gallons. (CFC 5003.10.4.2).
7. In elevators, limit toxic and highly-toxic gases to a container of a maximum water capacity of 1 pound (1 pint or 0.5 liter) (CFC 5003.10.4.3)
8. Put cryogenic or liquefied compressed gases in dewars or other containers into the elevator car by themselves with no passengers, including the handler. This means any container even 1 L and 2 L LN2 dewars. (CFC 5003.10.4.1.1).

1.8 Signs for Service Elevator

1. Post a sign, located by the call button, that the elevator is designated for hazardous materials transportation and is restricted to trained students and staff.
2. Post an approved sequence of operation in the elevator car.

Imaginary sequence.

Cryogenic Liquids

1. Place dewar in elevator. For small hand-held dewars, place them in a secondary containment tray or bucket to hold them upright.
2. Put key in lock to allow external elevator controls. You will not be permitted to ride in the elevator with the dewar.
3. Select the desired floor
4. Press the GREEN button that will stop the elevator at the desired floor while the door stays closed to prevent anyone from getting on.
5. Go to the other end of the building to the passenger elevators to reach the desired floor or take the stairs.
6. Go to the service elevator, place your key into the lock to unlock the elevator door.
7. Retrieve the dewar.
8. Go back into the elevator to unlock the external control mode to put it back into service.

Hazardous Materials

1. Load items into the elevator.
2. As a handler, you may accompany the items. Do not allow other passengers in the elevator.
3. In case spills or leaks, lock out the elevator using your key.
4. Report the spill so it can be cleaned up.
5. When contaminated residues have been removed, place the elevator back into service.

6. In the event you believe there is a hazardous vapor, gas, or mist being released, stop the elevator at the next floor. Get out and lock out the elevator.
7. Report the situation to your stockroom staff or EH&S.
8. If this is an emergency or you feel like you might lose consciousness before reaching the next floor, press the RED emergency call button. Explain the emergency to the dispatcher if you are able to.

End of imaginary operating sequence. Sequence will be updated when all the controls and design features are known

2. Off -Campus Transportation of Chemicals

Relocation or transporting chemicals off -campus involves additional requirement and is strictly regulated by the U.S. Department of Transportation (DOT). Under no circumstance, should chemicals be transferred in a personal or University owned vehicle. For off -campus relocation or transportation of chemicals, please contact EHS.