

*Spill Response Training  
for  
Chemical Spills  
Biological Spills  
Radiological Spills  
In Laboratories*



*Carnegie Mellon University  
Environmental Health & Safety*

# *Spill Response Training – Minor Spills*

## **A. Applicability of this training**

This training is for those persons identified as Spill Response Personnel for a particular laboratory in which hazardous materials are present or used.

## **B. Responsibility**

The spill response personnel should:

- Address the needs of exposed or injured persons
- Determine whether or not a spill is a minor spill and whether it is appropriate for him or her to clean up the spilled material
- Initiate a call to University Police should the spill be **inappropriate** for in-house clean-up
- Control the spill area
- Performing the spill clean-up and decontaminating the area

## **C. Training Refresher**

This training should be repeated on an annual basis for all laboratory spill response personnel.

## **D. Training Procedures:**

1. First Response Activities
2. Addressing the Needs of Exposed or Injured Persons
3. Determining Whether a Spill is a Minor Spill or a Major Spill
4. Selecting and Wearing Appropriate Protective Equipment for the Clean-up
5. Preparing a Spill Response Kit specific for your lab area
6. Performing the Spill Clean-up and Decontaminating the Spill Area

## **Procedure #1: First Response Activities**

- 1. Clear all persons from the area of the spill**
- 2. Check for personal exposure (splash, physical contact or inhalation)**

If there has been personal exposure of any sort, notify University Police (8-2323) and follow Procedure #2.

- 3. Determine the severity of the incident and respond accordingly**

To determine whether an incident is a major spill (or high risk situation) or a minor spill (or low risk situation), follow Procedure #3.

## **Procedure #2: Addressing the Needs of Exposed or Injured Persons**

This information is also available on the emergency response placard set present in each laboratory area.

### **For a Chemical Spill on the Body:**

**FLOOD** the exposed area with running water for at least 15 minutes  
**REMOVE** contaminated clothing and shoes while in a shower, where applicable  
**CONTACT** Security for immediate help, 268-2323  
**MSDS** should accompany the injured person for medical treatment personnel

### **For a Biological Spill on the Body:**

**FLOOD** the  
**REMOVE** co  
**CONTACT** Security for immediate help, 268-2323

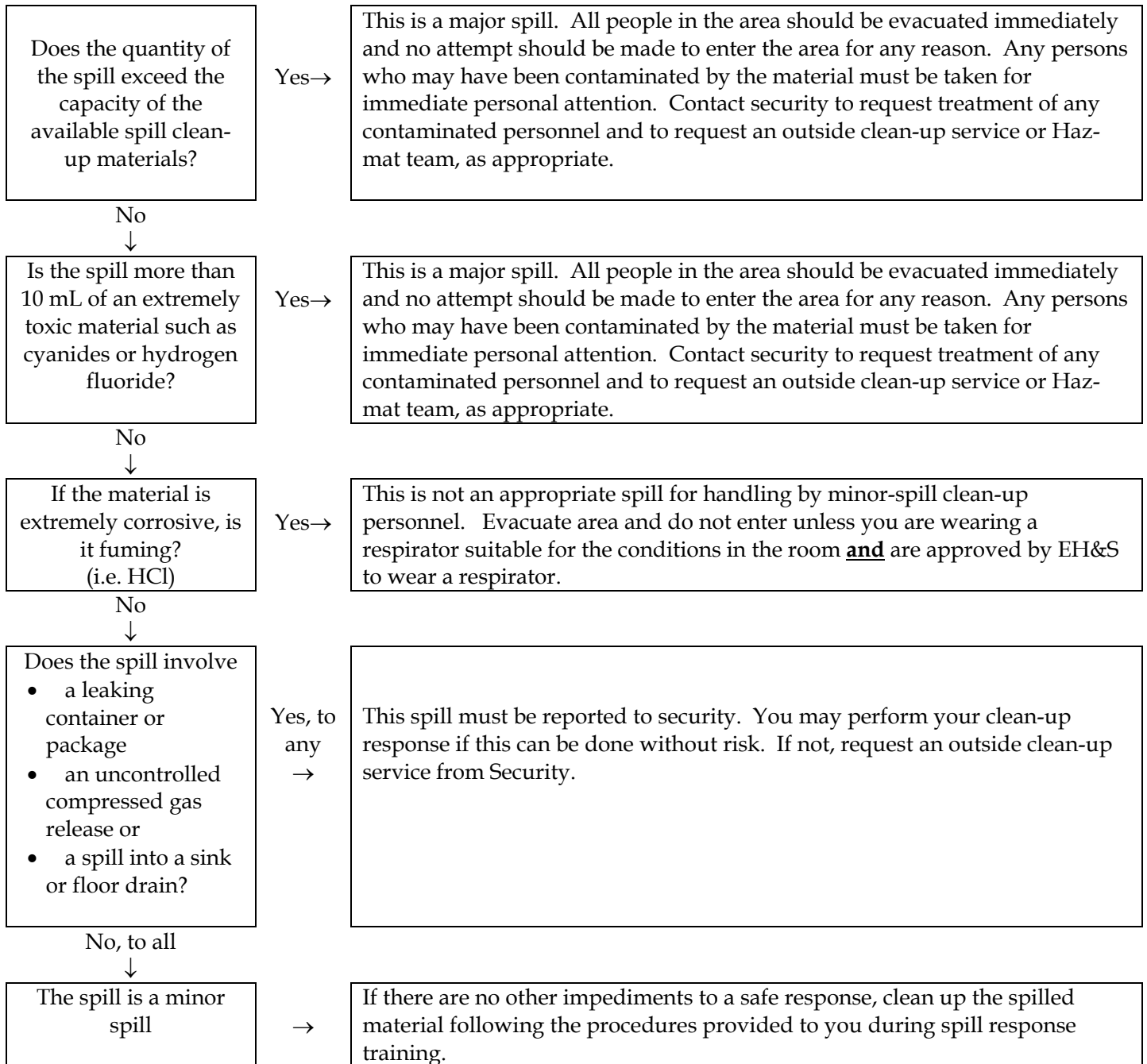
### **For a Radiological Spill on the Body:**

**FLOOD**  
**REMOVE** contaminated  
**CONTACT** Security for immediate help, 268-2323

### **For Hazardous Material Eye Contact:**

**RINSE** the eyeball and under the eyelids with water for 15 minutes  
**HOLD** eyelids open to ensure thorough washing  
**CONTACT** Security for immediate help, 268-2323

### Procedure #3: Determining Whether a Spill is a Minor Spill (Low Risk) or a Major Spill (High Risk):



## Procedure #4: Selecting and Wearing Appropriate Protective Equipment for the Clean-up

The following protective equipment is the minimum that should be used for any spill clean up:

- Splash goggles, not just safety glasses
- Lab coat with sleeves rolled down
- Protective gloves, as appropriate for the material to be handled (Gloves must be in good condition)

### SPECIAL NOTES:

The splash goggles are to protect your eyes from splashes. If they do not fit securely to your face, they will not provide this protection. If they have “pinhole” ventilation, they will not provide this protection

If there is a chance that your lab coat may become damaged or ruined by the chemical, it is best to wear a Tyvek® or similar suit over top of the lab coat.

There is a glove compatibility guide present on the EH&S web site (click the entry for laboratory chemical safety and select the Glove Compatibility Guide topic.) It is also a good idea to check the information presented (for the type of glove you have) in the safety supply catalogue. This provides the most specific information about compatibility of a particular glove. Get the gloves long enough to protect the portion of your hand and arm which extend from any lab coat or coverall.

Note that no one should wear a respirator to clean up a spill, *or for any other reason*, unless they have been trained and approved by EH&S to do so. If a respirator is indicated for a spill response and you are not approved to wear one, you must not respond to the spill. Rather you must report the incident to Security for coordination of the clean up.

## **Procedure #5: Performing the Spill Clean Up and Decontaminating the Spill Area**

Before the clean up begins, you must accumulate all appropriate spill clean up equipment. This may include any or all of the following:

- Polypropylene sorbent pads, pillows or socks
- Polypropylene sorbent pads with vapor barrier (for volatile solvents)
- Acid neutralizer
- Caustic neutralizer
- Solvent absorbent
- Heavy-duty plastic bags (with ties), for disposal of waste materials
- Dust pan, scoop or brush, for pick up of sorbed or neutralized material

- a.) After donning the protective equipment listed previously, the responder should control the source, if it is still present. For example, a bottle that was knocked over will still have some chemical in it. The responder should carefully upright the container, place it on a polypropylene pad in a safe location, and replace the lid on the container.
- b.) Next, if the spill is < ~50 mL, control the spread of the spilled chemical, and absorb the free liquid. Placing polypropylene pads around and on the spill generally works best. If the spill involves broken glass, it is important to take care not to get cut or to cut one's protective gloves. The used pads should be placed in a trash bag for disposal. Be sure to check under drawers and behind or under equipment for the remains of a spill. Flammable liquids should be absorbed using polypropylene pads with vapor barriers to prevent unneeded volatilization of the solvent into the air.

If the spill is <~50 mL, you can usually apply the neutralizing material (for acids or caustics) directly to the spill and continue from item d.) below.

- c.) Remove the broken glass, CAREFULLY.
- d.) Decontaminate the area. Neutralize acid or caustic spill residue with appropriate neutralizing material. Sweep up the spent neutralizer. Moisten a pad and use it to wipe up any remaining residue from the sorbent process. Continue this until the area is clean.
- e.) Decontaminate the container. Using pads or neutralizers, clean the outside of the container, removing all traces of the spilled material
- f.) Inspect the spill area for any further residue or contamination.
- g.) Place all spill residue in a waste bag and mark it for disposal, following University waste disposal procedures.
- h.) Restock the spill kit with the items used in the clean up.

## **Procedure #6: Preparing a Spill Response Kit, Customized for the Hazards Present in your Laboratory**

All spill response kits typically contain four types of materials

- 1) Protective equipment for the responder
- 2) Sorbent or similar material to clean-up the spill
- 3) Decontamination materials to decontaminate the spill area
- 4) Waste disposal materials to assist in the removal of contaminated product and items

**ALL OF THE MATERIALS IN THE SPILL RESPONSE KIT MUST BE APPROPRIATE FOR USE FOR THE TYPE OF HAZARDS PRESENT IN YOU LABORATORY**

### **YOU WILL NEED:**

#### **Protective Equipment**

Splash goggles to protect your eyes

The correct type of gloves to protect your hands and arms

An appropriate coverall to protect your clothing and body

#### **Sorbent/Collection material**

Appropriate for the type of material and the size of spill planned for

May include neutralization as part of its activity

#### **Decontamination material**

Generally a neutralizer, to remove final traces of hazardous material

#### **Waste Disposal items**

To contain and removed the contaminated items and pick-up materials--such as disposal bags, scoops for sorbents, rags for final cleaning of spilled areas.

## *Spill Response Kit Supplies*

*Use this chart if you are making up your own, customized spill control kit*

Fisher Products	Lab Safety Products	Item	Acids	Caustics	Solvents	Hg	Bio- hazards	Formal- dehyde
A	A	Chemical resistant gloves	X	X	X	X	Get	X
A	A	Splash goggles (2)	X	X	X	X	A	X
A (by case only)	A (individually)	Coveralls (Tyvek®) (2)	X	X	X	X	Kit	X
A	A	Acid neutralizer	X				They're	
A	A	Caustic neutralizer		X			Real	
A	A	Solvent absorber			X		Cheap	
A	A	Sorbent pads	X	X		X	!	X
N/A	A	Sorbent pads (vapor barrier)			X			
A	A	Scoop (if using neutralizer)	X	X	X	X		X
N/A	A	Waste bag	X	X	X	X		X
A	A	Mercury sorbent/sponge				X		
A	A	Disinfectant pads/spray kit					X	
A	A	Formaldehyde sorbent						X
A (Only with Kits)	A	Pails	X	X	X	X		X

A - Available from this supplier

N/A - Not available from this supplier

**Remember that you MUST have a mercury spill kit in your lab where mercury containing equipment, such as thermometers or barometers, are present.**

Use this chart (and next page) if you are going to buy a commercial kit

	Fisher Mini Spill Kit	Fisher Spill Cabinet	Fisher Spill Cont. Station	Fisher Kollect- A-Kem	Lab Safety 30 gal drum SpillDefense	Lab Safety Junior kit SpillDefense	Lab Safety Wall mount SpillDefense
Capacity	1L per kit	2.5-3 gal	3.7 gal	11 gal	17 gal	12 gal	7 gal
<b>COST (appx)</b>	<b>\$56.16 for 6 kits</b>	<b>\$87.36</b>	<b>\$470.55</b>	<b>\$308.98</b>	<b>\$298.20</b>	<b>\$181.90</b>	<b>\$61.15</b>
Pads		5	15	10			8
Socks					10	6	
Pillows		6	10 (std) 2(HF)	10	15	10	9
Partic. Sorbent	1 (6)	2					
Shoe covers		1					
Gloves	1 (6)	1	2	2	2-silvershield 2-nitrile	1-silvershield 1-nitrile	1-silvershield 1-nitrile
Goggles	1 (6)	1	2	2	2	1	
Coveralls		1 (apron)	2	2 (aprons)	2	1	
Pail							
Scoop/shovel	2 (6)	1			1	1	
Disp. Bags	1 (6)	2	15	10	24	4	2
Acid neutralizer					1	1	
Caustic neutralizer					1	1	
Other					pH paper	pH paper	

Both mercury and biological agent response kits are available from Fisher or Lab Safety

Use this chart (and previous page) if you are going to buy a commercial kit

	Fisher Caustic Kit	Fisher Acid Kit	Fisher Solvent Kit	Lab Safety Caustic Kit	Lab Safety Acid kit	Lab Safety Solvent Kit	Lab Safety HF Kit
Capacity (appx)	1L	1L	4L	1L	1L	1L	1L
<b>COST (appx)</b>	<b>\$142.65</b>	<b>\$142.70</b>	<b>\$142.65</b>	<b>\$203.60</b>	<b>\$201.65</b>	<b>\$207.40</b>	<b>\$266.75</b>
Pads							
Socks							
Pillows							
Partic. Sorbent	1	*	1	1	1	1	1
Shoe covers	1	1	1				
Gloves	1	1	1	1	1		
Goggles	1	1	1	1	1		
Coveralls	1 (apron)	1 (apron)	1 (apron)				
Pail							
Scoop/shovel	1	1	1	1	1	1	1
Disp. Bags	1	1	1	1	1	1	1
Acid neutralizer		2		1	1		
Caustic neutralizer	1			1			

\*Neutralizer and sorbent as a combined product

### **Notes on preparing your spill response kit.**

1. The first thing is to identify the types of hazards you have in your laboratory. If you have just one class of hazard, a prepared kit is often most cost effective. Where multiple hazards are present, you may want to consider preparing your own kit.
2. Consider the ease and expense of replacing materials into your kits as they are used.
3. Keep your kits in a handy, well-marked and easily accessible location at all times.
4. Keep your instructions on spill response procedures with the kit.
5. Identify the persons who have been trained in spill response and ensure that they are the only ones performing this activity.
6. Due to the cost of purchasing kits and individual response items, consider grouping with other labs to save expenses. For example, a department may purchase a case of neutralizer or of TYVEK suits and make them available for several laboratories to put into their kits.
7. Don't bother preparing for large-scale spills – remember you won't be handling them!
8. When you purchase chemically resistant gloves, buy ones appropriate for the material being used. And don't rely on those flimsy, thin gloves for chemical protection!