

**GUIDELINES FOR SLUG DISCHARGE MANAGEMENT PLAN**  
*(Abstract from EPA Guidance Manual)*

1. An IU Slug Control Plan must include sufficient general information to enable the POTW to: (1) categorize and restrict the IU's potential for a slug discharge; and (2) respond promptly and effectively in an emergency. General information should include IU name, address, contact person, a brief description of the IU, discharge practices, applicable pretreatment standards, and description of previous slugs and corrective actions.

These procedures shall be in compliance with 40 CFR 403.8(f)(2)(V).

2. Facility Layout Flow Diagrams

Each Plan should include detailed drawings of the facility showing the following:

- A. General layout of the facility
- B. Areas occupied by manufacturing or commercial activities; property boundaries, drainage of rainwater, and connections to the City's sanitary sewer and storm drains
- C. Hazardous materials process and storage areas; waste handling, storage, and treatment facilities
- D. Loading and unloading areas
- E. Drainage areas showing floor drains, pipes, channels and sumps and all associated operations in areas
- F. Flow diagram(s) showing chemical and wastewater flow including piping and instrumentation, flow rates, tanks and capacities, treatment systems, and final destinations of flows

3. Material Inventory

The plan should show the following:

- A. Materials - both chemical and trade names should be listed in the inventory (OSHA, MSDSs may be used).
- B. The locations of all materials.

- C. The type of container (i.e. steel drum, fiberglass tank, etc.) and the volume of the container for each material shall be called out. The presence of attachments such as valves, pumps and transfer pipes shall be noted.
- D. Transfer and transport areas . the condition of containers and transfer equipment shall be noted.
- E. The data on the physical, chemical, and toxicological effects of each material, and special precautions that should be taken when handling these materials should be noted. A discussion should also be provided on the procedures to prevent contact between incompatible materials. Each facility must demonstrate that the following three compatibility aspects have been considered: (1) the construction of the container; (2) other materials in the immediate vicinity; and (3) the surrounding environment.

#### 4. Spill and Leak Prevention Equipment and Procedures

- A. The Plan should describe current and projected inventories equipment to prevent spills and to contain them. Equipment to prevent spills consists of appropriately selected chemical storage and process equipment, as well as built-in safeguards to prevent chemicals from being spilled such as secondary containment structures. Spill containment equipment consists of equipment or apparatus to keep a spill from spreading and to remove the spill. Examples of prevention and containment equipment are listed below:

##### I. Equipment to Prevent or Detect Spills

- a. Chemical Storage and Process Tanks: holding tanks, pumping equipment (compatible material); shell and bottom construction (compatible material); underground seepage protection; cathodic protection of underground tanks; liquid level sensing devices; overflow, temperature, pressure alarms; heating coils; collision protection support construction; secondary containment; diversionary structures in quench tanks.
- b. Drums: drum construction; storage areas, secondary containment, diversionary structures, collision protection, drum handling equipment, drip pans.

- c. Pipes, Valves, Fittings, Pumps, Electrical and Mechanical Equipment: seals, valve stem packing, gaskets, cathodic protection, vehicular traffic warning signs.
  - c. Loading Stations: fill safeguards, curbs and drains, warning signs/improper disconnect protection, secondary containment.
  - e. Alarm Systems: to detect unauthorized discharge flows, pH excursions, etc.
- II. Equipment to Contain Spills: booms, barriers, sweeps, and fenders; surface collecting agents; absorbent materials; skimmers; oil/water separators; sumps; sewer plugs.

B. Procedures

Simple operating and maintenance procedures directed at eliminating spills and leaks include, but are not limited to, the following:

- I. Inspect All Chemical Storage Vessels. As Well As All Process Vessels and Fittings (Pumps, Valves, Piping): The items must be constructed of material compatible with the chemicals passing through them. In particular, tanks and drums used to store corrosive chemicals should be constructed of stainless steel or of a corrosion resistant plastic. The Plan should discuss all routine operation and maintenance (including housekeeping and replacement of worn-out equipment) performed to minimize spills. The frequency of inspections and monitoring for leaks or other conditions that could lead to spills should also be indicated. Any pumps or valves used to process these chemicals must possess corrosion-resistant seals and packings. Similarly, pumps or valves through which organic chemicals pass must contain seals and packings which are dissolution-resistant. The IU should indicate in its Plan that appropriate materials of construction have been used, and are compatible with the chemicals being processed.
- II. Inspect Foundations and Supports of Large Storage Tanks, Process Vessels, and Piping: These must also meet compatibility and integrity requirements: All above ground vessels should be protected from vehicular damage through the use of truck guards. Underground vessels and pipes should be well marked and weight limits placed on roadways that may cross these underground vessels. All underground vessels should be

cathodically protected to prevent damage due to corrosion. Underground piping should be double-walled at vehicle crossings.

- III. Equip Open Storage and Process Tanks With Liquid Level Control Devices, and Grounding Apparatus (where necessary): In addition, overflow alarms should be installed to warn personnel of tank overfilling. Similarly, temperature and pressure alarms should be installed on closed chemical processing equipment, to alert industry personnel to runaway reactions or other factors resulting in excessive temperatures and pressures. Such extreme conditions can otherwise result in the automatic opening of relief valves, subsequently spilling the process vessel's contents.
- IV. Use Proper Drum Handling Equipment: The practice of scooping drums with the forks of a forklift should be eliminated. Pallets should be used to aid handling and inspection. Oil dispensing racks should be provided with drip pans.
- V. Secure Loading/Unloading Pump Station Controls: In a manner to prevent the pumps from being turned on by unauthorized personnel. Warning signs or physical obstructions such as crossing gates, should be used to prevent trucks from driving away while the loading hose is connected.
- VI. Eliminate All Unnecessary Cross Connections: All unnecessary floor drains should be plugged, especially those in high-risk areas.
- VII. Utilize Automatic Stormwater and/or Sewer Sampling Systems to Monitor for Spills: These sampling systems can be tied into automatic shutoff devices that will prohibit discharge from a plant effluent system.

## 5. Emergency Response Equipment and Procedures

### A. Equipment

Information that should appear in this section of the IU's Plan includes an inventory of available IU emergency response equipment and a detailed description of emergency response procedures. The emergency response equipment inventory should also contain the equipment location on the facility layout diagram and a physical description of each piece of

equipment. A summary of the information that should appear in this part of the Plan follows:

- I. Communication Equipment and Alarms: A communication system should be established for reporting emergencies and providing immediate emergency instruction to facility personnel with the use of a telephone, intercom, radio, alarm, etc.
- II. Spill Containment and Control Equipment and Tools: Examples of this type of equipment include sorbent materials and dry chemicals which are often used for containing spills of small volumes.
- III. Spilled Material Storage Containers: Chemical spills must be contained and removed as soon as possible to prevent materials from spreading into other areas.
- IV. Protective Clothing and Respirators: In responding to an emergency hazardous spill, employees should take precaution to ensure that as much skin is covered as possible. Flameproof protective clothing will not only prevent chemical burns, but will also protect skin during a fire. Other examples of protective clothing include:
  - Rubber Gloves
  - Apron
  - Goggles/Face Mask
  - Hard Hat

In addition, depending on the nature of the emergency, the use of self-contained breathing apparatus may be necessary. All employees involved in response procedures should have access to the breathing apparatus and be adequately trained in the use of this equipment.
- V. First Aid Kits: A well equipped first aid kit should be immediately available for use if necessary. The Plan should indicate the location of the kit and the items that it contains. Items that are essential to a first aid kit include: antiseptic solutions and bandages for application of wounds; artificial respiration devices, and eye washing solutions and cups.
- VI. Ventilation Equipment: Before entering an area where a potentially explosive spill has occurred, tests should be made for explosive atmosphere, the presence of toxic gases and oxygen deficiency. Whenever an adverse atmosphere is encountered, forced ventilation, such as powered explosion-proof ventilators, blowers, or fans, can be used to create safe conditions. Ventilation should be

continued as long as recurrence of the hazard is possible.

- VII. Decontamination Equipment: The appropriate protective clothing and monitoring equipment should be used in responding to a spill of radioactive material.
- VIII. Fire Extinguishing Systems: A list of fire extinguishers and their locations should be posted throughout the plant. In addition, a map that shows both fire extinguisher location and fire hose connections should be submitted to local response agencies.

**B. Procedures**

Each Plan should contain a detailed description of procedures to be followed in responding to a hazardous spill at the facility. The established procedures should be designed to eliminate danger to human health and to facilitate containment and clean-up of a spill. A description of the procedures should contain the following items: notification of responsible personnel, chain of command, evacuation procedures, notification of response agencies, and spill assessment and response procedures. A fuller description of each of these elements follows:

- I. Notification of Facility Personnel Responsible for Responding to Spills: Each facility should have a person(s) who is qualified to respond to a spill at the facility. There should be at least one person available at all times to carry out appropriate response procedures. This person(s) should be familiar with all aspects of the Plan and have the authority to commit the resources necessary to initiate emergency response procedures. All employees should be aware of which person(s) to contact if a spill takes place. It is recommended that a sign indicating who to contact and the appropriate phone number(s) be posted in all areas where a spill may occur.
- II. Chain-of-Command: Proper chain-of-command procedures should be followed when responding to an accidental spill or slug to ensure that all necessary personnel and response agencies are notified. A description of these procedures should be included in the Plan.

- III. Evacuation Procedures: An evacuation Plan should be posted throughout the facility and discussed in safety training sessions. The Plan should contain: (1) a map of evacuation routes; (2) a map of alternative evacuation routes; and (3) a description of signals used to begin and conduct an evacuation. A copy of the evacuation Plan should be submitted to the local police department, fire department, and hospitals for their records.
- IV. Notification of Response Agencies and Contractors: A list of spill response agencies and their numbers should be available to each employee assigned to coordinate spill response activities. In the event of potential or actual emergency situations, the appropriate response agency should be notified immediately.
- V. Still Assessment and Response Procedures: The person(s) designated to carry out spill response procedures should begin by assessing the spill. A determination should be made on the origin of the spill and what impact the spill will have. Based on this assessment, the coordinator will initiate proper response procedures. Spill response procedures that should be included in the Plan include:
- Notification of facility personnel by activating the communication and/or alarm system
  - Begin evacuation procedures if necessary
  - Notification of appropriate local, State, Federal agencies
  - Stop the flow by shutting off pumps or closing valves
  - Prevent contact between incompatible materials
  - Commence clean up activities Submit necessary reports
- VI. Procedures for Clean-up, Treatment, and/or Disposal of Spilled Materials: Once a spill has been contained, clean-up of the waste material begins. The material should be immediately treated or disposed of to eliminate health and safety hazards and to prevent the dispersion of the material. The objectives of treating the material prior to disposal are to reduce the potential impact of the waste on water quality and to recover valuable materials. Several methods of disposal are available, however, the facility should choose the proper method based on the nature of the material. If waste generated from a spill is determined to be hazardous, the facility

must meet RCRA requirements. Information pertaining to treatment and disposal methods used by the facility should be included in the Plan.

In addition, if it is anticipated that outside contractors and/or consultants may be utilized in clean-up, treatment, or disposal methods, the Plan should include the name of the company, contact person and phone number, and the available equipment and manpower necessary for the job if possible.

These procedures should be consistent with the ones established in the facility's OSHA Emergency Action Plan, as required by 29 CFR § 1910.38.

#### 6. Slug Reporting

Procedures for reporting and documenting spills and slug discharges should be described in the Plan. At a minimum, the IU follow-up report should include: (1) the time, date, and cause of the incident; (2) the impact of the spill on the POTW and the environment; (3) extent of injury and/or damage; and (4) how other incidents of this type can be avoided in the future. A description of clean-up, treatment, and disposal procedures must be included where applicable. The report should also evaluate the adequacy of the IU's response procedures. In particular, the investigator's reports should address the following questions.

- Was the safety of industry personnel and the surrounding community ensured throughout the incident?
- Were personnel working close to the incident provided adequate access to breathing apparatus, protective clothing, etc.?
- Was the spill confined quickly?
- Was fire extinguishing equipment adequate and readily available when needed?
- Did secondary containment structures remain intact throughout the spill response? Were these structures of adequate volume to confine the spill or slug discharge?

- Were appropriate POTW, fire department, or other officials immediately notified of the incident?

Recommendations for improving operational, inspection, maintenance, and/or spill response procedures based upon the incident should be included. The investigation report should then be made available to the POTW, fire department, and insurance firms if applicable, to assist these agencies in their own investigations. In addition to reporting procedures, copies of forms used for reporting and a list of appropriate response agencies and phone numbers should be incorporated into the Plan.

#### 7. Training Program

More important than establishing the IU Slug Control Plan is the effective implementation of that Plan by IU employees. The IU's Plan should contain an outline of the training program given to employees. An employee training program can provide employees at all levels of responsibility with a complete understanding of the processes and materials used, the safety hazards, the practices for preventing discharges, and the procedures for responding properly and rapidly to hazardous materials spills and slugs. Specialized training should also be provided to each employee or group of employees that handle potentially hazardous chemicals.

Periodic training sessions are essential and should be conducted at appropriate intervals to assure complete understanding of the IU's Plan, goals and objectives. New employees should be trained immediately upon employment. Employees should also be notified and retrained when their responsibilities or functions change under the Plan change. Training records should be maintained by the plant manager as long as a person is employed at the facility and for at least three years from the date the employee last worked at the facility. Periodic drills should be instituted to evaluate employee knowledge and understanding of the Plan. The purpose and frequency of such drills should be indicated in the Plan. Training to implement the OSHA-required Emergency Action Plan should also be coordinated

with the Plan training, especially when the procedures and responsibilities are uniform. To the extent the procedures differ, Emergency Action Plan training should be conducted periodically as well to ensure worker safety in the event of a slug or any other emergency.

8. Certification

A qualified professional should certify the adequacy of the measures described in the Plan, and the Plan shall be attested by a CEO.