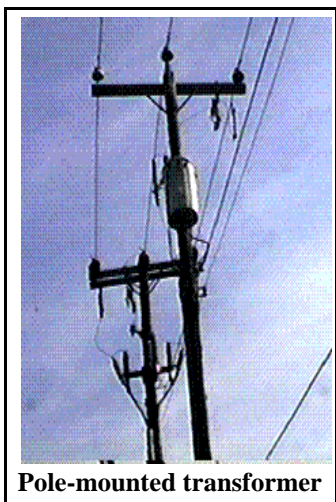




# Oil-Spill Prevention, Control, and Countermeasures

## Introduction



**J**efferson Lab takes seriously its responsibility to maintain high standards in protecting the environment from contamination by oil products and oily wastes.

This chapter focuses on oil issues addressed in Jefferson Lab's Spill Prevention, Control, and Countermeasure (SPCC) Plan—a separate controlled document maintained by the SPCC Coordinator.

The SPCC Plan expresses the Laboratory's commitment to address all oil-related issues including:

- prevention of environmental contamination
- appropriate actions to take to stop or control leaks
- actions to take to clean up after leaks and prevent them from occurring again

Under the Lab's Environmental Management System (EMS), some of the Jefferson Lab environmental aspects that are addressed are:

- Spills
  - oily water spills
  - oil spills
  - transformer oil spill
  - oil compressor leak
- Regulated Waste - chemical spill clean-up debris and spill response, and spill prevention

**Appendices:**

- *EPS 32-T1 SPCC Inspection Checklist*
- *EPS 32-R1 SPCC Regulatory Requirements*
- *EPS 32-R2 SPCC Plan Distribution List*

**Other important references:**

- Appendix 3510-R1 Spill/Release Response Procedures*
- Appendix 3510-R2 Incident Report Form*



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## Key Terms

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**contaminate** To pollute through contact or mixing.

**harmful quantity** An oil discharge that causes a film or sheen upon the water or adjoining shorelines; discolors the water or adjoining shorelines; or causes an emulsion or sludge to be deposited beneath the surface of the water or upon adjoining shorelines.

**navigable waters** Waters of the U.S. including territorial seas; any waters susceptible to commerce or subject to tidal activity; interstate waters including wetlands; all other waters, lakes, or streams and their tributaries whose use or degradation could affect commerce or use. (Note that most of Jefferson Lab's surface waters flow to a drinking-water reservoir and therefore meet this definition.)

**notable event** An incident investigation report that chronicles the sequence of events in a spill or other incident, including what happened to cause the spill and how it was mitigated.

**oil** Oil of any kind or in any form including, but not limited to, petroleum, fuel oil, vegetable oils, sludge, oil refuse, and oil mixed with wastes other than dredge spoil. [reference: 40 CFR 112.2]

**oil discharge** Any spilling, leaking, pumping, pouring, emitting, emptying, or dumping that allows harmful quantities of oil to enter the waters of the U.S. or the adjoining shorelines.

**reportable discharge** Release of oil into waters or onto shorelines in quantities that may be harmful to the environment or to public health or welfare, including those that violate any water quality standards or cause a film or sheen on the surface of any water.

**sheen** Oil that has spread to cause an iridescent appearance on the surface of water.

**sludge** An aggregate of oil and other matter of any kind in any form other than dredged spoil and having a combined specific gravity equivalent to or greater than water.

**spill** To cause or allow inadvertently to run out or flow.

**spill event** A discharge of oil in any quantity that may be harmful to the environment or that could impact the ground or "waters of the state".

**waters of the state** Includes all waters (lakes, streams, rivers, ditches, etc.) on the surface and under the ground, wholly or partially, within or bordering the Commonwealth of Virginia or its jurisdiction.

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## Hazard Avoidance

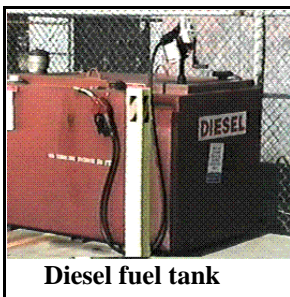
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Don't forget to notify your supervisor of any incident.

- ❖ Do not bring onto Jefferson Lab property a vehicle or equipment with a significant oil leak. Do not change your automobile oil anywhere on-site.
- ❖ Avoid oil spills by following proper handling procedures.
- ❖ If you see a 'sheen' on water in a storm water channel or pond, evidence of oil leakage, or a spill where oil is on the ground, immediately call ext. 4444 to start the on-site notification chain.

If you work with systems or equipment that use oil:

- ❖ Follow the Preventive & Scheduled Maintenance Programs described in the Jefferson Lab SPCC Plan and the SOPs for your work area.
- ❖ Follow equipment and container inspection procedures described in the SPCC Plan and in the SOPs for your work area.
- ❖ Be alert to leaks and spills and contact the local building manager if you suspect a problem.
- ❖ Check condition of hoses and piping and provide necessary secondary containment prior to making an oil or fuel transfer.
- ❖ Cover floor and storm drains during oil or fuel transfers.
- ❖ Do not fill equipment to more than 90% of capacity unless noted otherwise in the SOP for that piece of equipment.



Diesel fuel tank

If you use a diesel forklift:

- Before refueling the diesel forklift, bring it to a complete stop, set the emergency brake, and turn the vehicle off. Ensure the refueling nozzle is adequately inserted into the fuel tank of the forklift, and pump the fuel slowly to ensure that it does not overflow onto the ground.

Quick action in the event of a spill will minimize contamination.  
Immediately use the containment and clean-up measures available to you.  
Don't hesitate to call for help at ext. 4444.

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## Responsibilities

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### Everyone at Jefferson Lab

- ❖ Be alert for oil or fuel spills in your work area.
- ❖ Call ext. 4444 immediately upon discovering an oil sheen, spill, or unplanned release
  - on the ground—anywhere
  - in or on a surface water body
  - at or near a floor or storm drain
  - inside buildings
  - anywhere, even if captured in secondary containment

### Everyone who works with oil

- ❖ Be aware of potential oil contamination problems in your work area and how to contact the appropriate people to address or resolve any concerns.
- ❖ Prior to performing equipment installation or maintenance, or prior to handling and transporting any oil, ensure that all spill prevention and control measures are in effect to prevent the spread of any potential spillage.
- ❖ Immediately report problems with equipment or procedures to your supervisor.
- ❖ Be familiar with oil-related SOPs and the special response procedures for your work area in the event of an oil spill.
- ❖ Recommend improved methods to prevent oil spills and leaks in your work area.

### Line Managers/SOTRs/Hall and Group Leaders

- ❖ Provide containment pallets or suitable secondary containment for all oil containers with 5 gal or more capacity.
- ❖ Designate in SOPs the locations of all outdoor oil or fuel transfer operations and major indoor transfers.
- ❖ Minimize oil use and consider spill prevention and containment during the planning stage for new processes or jobs.
- ❖ Provide oversight of oil-containing equipment installation and maintenance subcontracts.
- ❖ Consult with ESH&Q staff during the planning stage to identify oil control measures and to resolve issues concerning placement, secondary containment, and other control measures for new or relocated equipment.
- ❖ Instruct personnel in the operation and maintenance of equipment and how to address a spill or release, including same day completion of the Spill/Release Report Form found in [Appendix 3510-R2 Incident Report Form](#).
- ❖ Ensure all necessary handling, storage, maintenance, and disposal of oil or oil-containing equipment is performed in a manner that maximizes spill prevention.



Oil clean-up materials



- ❖ Perform and document proper maintenance and inspections of all equipment containing oil. Provide inspection records to SPCC Coordinator upon request.
- ❖ Oversee and coordinate with ESH&Q Division staff the collection and disposal of any used oil.
- ❖ If there are changes or revisions to the SPCC Plan, implement stated actions within six months of notice.
- ❖ Oversee clean-up contractor activities to assure work performed meets regulatory requirements.
- ❖ Prepare, review, and implement SOPs for all petroleum or fuel transfer operations.
- ❖ Ensure all personnel or subcontractors involved in petroleum use, storage, or handling receive documented SPCC training.
- ❖ Ensure that labeling on all oil-containing drums and tanks in your area is legible and written in permanent marker.
- ❖ Provide a completed Spill Report Form the same day as any oil released. (See [Appendix 3510-R2 Incident Report Form](#).) Perform any identified follow-up actions.
- ❖ Prepare a Notable Event for any oil product spill that meets identified criteria. Division ESH&Q staff will assist.
- ❖ Provide guidance to subcontractors to develop procedures to address SPCC concerns to be included with their safety plan. ESH&Q Division staff are available if needed.
- ❖ For Transformers: use the SPCC Inspection Checklist to perform and document
  - monthly visual inspections of each transformer with secondary containment.
  - twice monthly visual inspections of each spare transformer and each transformer without secondary containment.

## **Division ESH&Q staff**

Assist line management:

- ❖ in reviewing plans for incorporating new equipment into an existing or new structure or relocating or altering existing equipment.
- ❖ in developing appropriate safety and inspection precautions and procedures to address oil-containing structures or devices in their work area.
- ❖ with completion of Incident Report and incident investigations after any spill.
- ❖ with preparation of a Notable Event for any oil product spill that exceeds 5 gallons OR violates other criteria as noted in this chapter.

## **ESH&Q Division Industrial Hygienist**

- ❖ Manage the Jefferson Lab used-oil management program in coordination with Physics and Administration Division management. Develop and implement programs that ensure all used oil is disposed of under the direction of the Accelerator Division ESH&Q staff.
- ❖ Ensure that the Used Oil Shed (UOS) and its contents are maintained in compliance with regulations.
- ❖ Ensure that the Chemical Assistance Team receives appropriate training to respond to and control oil spills.



## **ESH&Q Division Staff**

- ❖ Maintain used oil collection, consolidation in the UOS, and the disposal program.
- ❖ Provide assistance in sampling soil and/or water to aid in problem identification and to verify a completed cleanup.
- ❖ Monitor used-oil recycler transfer operations.
- ❖ Maintain inventory of spill containment equipment and absorbent materials for spill team (the Chemical Assistance Team) use and replenish as necessary.
- ❖ Monitor transporters and disposal or reclamation firms for regulatory and contractual compliance on an 18 to 24 month schedule.

## **Facilities Management Director**

- ❖ Maintain sluice gates as provided in the Standard Operating Procedure (SOP).
- ❖ Assist line management with control and containment of any large spills or any spill which extends beyond the confines of a building.
- ❖ Coordinate arrangements for emergency cleanup, contracting cleanup as needed.

## **SPCC Coordinator**

- ❖ Maintain and update master SPCC Plan and other necessary documentation.
- ❖ Ensure that reviews of the SPCC Plan are performed every five years as identified in the Plan and updated accordingly. Secure professional engineer recertification when amended.
- ❖ Upon request, assist line management in the oversight of oil-containing equipment installation and maintenance to ensure ESH&Q compliance.
- ❖ Oversee SPCC training program, including identification of training requirements.
- ❖ Review and maintain spill response procedures for Jefferson Lab.
- ❖ Assist Facility Manager to determine if oil spill events meet DOE Occurrence Reporting requirements, Chapter **5300 *Occurrence Reporting***, and notify Facility Manager.

## **ESH&Q Reporting Manager**

- ❖ Transmit any amendments to the SPCC Plan resulting from a spill to the Environmental Protection Agency (EPA) through the DOE Site Office, as required.
- ❖ Maintain official file of incident reports including those from spill events and Notable Event reports.
- ❖ Maintain a record copy of the SPCC Plan and have it available for EPA review.
- ❖ Assist Facility Manager to determine if oil spill events meet DOE Occurrence Reporting requirements, Chapter **5300 *Occurrence Reporting***, and notify Facility Manager.

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## Qualifications

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Individuals who work with oil having an initial risk code  $\geq 2$  must be trained to anticipate, prevent, and mitigate spills. The objective of the training program is to reduce the likelihood and impact of oil spills.

### **Training**

- ❖ All employees and subcontractors shall receive basic oil-spill response information as identified in 40 CFR 112 during their Jefferson Lab ESH&Q Orientation, including designated contacts in the event of an oil spill.
- ❖ Line Management will provide general SPCC Plan Training to all staff involved with oil handling or management and annual refreshers thereafter.
- ❖ Local supervisors shall provide SOP-based job-specific training on oil spill prevention and control measures.
- ❖ Personnel who are involved in the use or transport of oil or oil products, including their line managers, shall receive general and job-specific SPCC training. An additional briefing shall be given, as needed, to maintain a good working knowledge of this program.
- ❖ ESH&Q staff involved with oil handling shall complete the 8-hour biennial First Responder training. [The refresher course can be taken on-line at the Safety Lab.]
- ❖ Forklift operators moving oil products or oily-waste materials must have a current Forklift Operator's Certificate and have completed the 8-hour First Responder Training. A biennial refresher is required.

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## Site Program

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The SPCC Plan presents a picture of the oil and petroleum product program on the Jefferson Lab site.

- ❖ There are a total of 53 oil-cooled, electrical-power transformers, thirteen of which belong to Dominion Virginia Power. (Note: Dominion Virginia Power has its own SPCC Plan covering its on-site transformers. Sizes range from 13 gal capacity to 5,000 gal, with a total on-site volume of about 33,000 gal. The many small capacity transformers that support the accelerator power supplies do not contain oil.



- ❖ There are eleven structures that house mechanical equipment, primarily for support of the cryogenic system. These buildings and one experimental hall contain equipment holding about 7,800 gal of oil.
- ❖ There are miscellaneous small oil collection areas around the site. The main used-oil storage area is the UOS Shed located outside of the Test Lab. All on-site used oil is consolidated into 55-gal drums within that building, under supervision of Accelerator Division ESH&Q staff. No more than four 55-gal drums are accumulated at one time. A licensed used-oil hauler picks up the oil when notified. The Accelerator Division Industrial Hygienist shall specify all standards and ensure compliance with all known requirements for used oil accepted through the UOS.
- ❖ There are 12 generators (six natural-gas powered, four LP gas-powered, and two diesel) installed near buildings and at the main entrance to the Accelerator Site for the Guard Gate House. There is also one portable diesel unit. The 11 generators and portable tank hold a total of about 24 gallons of oil. The generator near the North Access Building contains a 5,000 gallon reservoir.



Oil contaminated with hazardous waste shall be handled according to procedures for hazardous waste, Chapter **EPS-61 Hazardous Waste Management**.

Oil contaminated with activated water, such as from a cooling water pump, should be turned over to RadCon for proper management and disposal.

Site-specific events that likely require external immediate notifications include:

- oil sheens (on water)
- any oil in a surface water 'spill event'
- any oil into the sanitary sewer system

Notify on-site responders at ext. 4444. The Facility Manager (876-1750) shall evaluate the situation to verify the presence of a sheen, a reportable discharge, or a spill event. External notifications will be carried out as described in Chapter **5300 Occurrence Reporting** or under *Appendix EPS 50-T1 Spill and Release Reporting Requirements*.

Non-oil, hazardous substances, and other potential environmental pollutants found at Jefferson Lab (located mostly in the EEL and Test Lab buildings), are addressed in Chapter **6750 Environmentally Harmful Materials**. The procedures for preventing spills of these materials are addressed in Chapter **6610 Chemical Hygiene**.

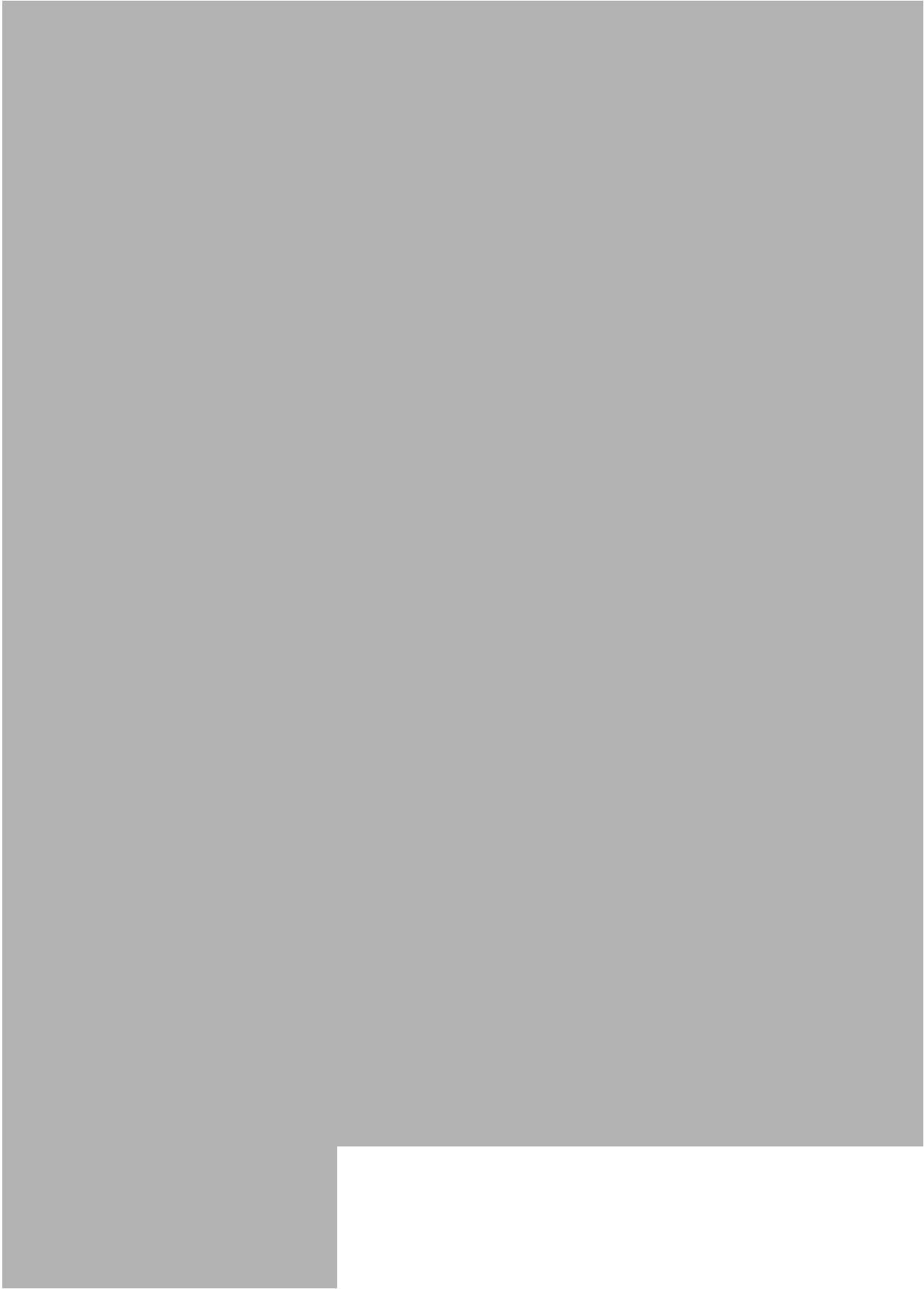




Thomas Jefferson National Accelerator Facility

# EH&S Manual

## EPS-32 SPCC





**The SPCC Plan addresses  
Responsible staff**

The SPCC Plan contains a list of staff who are responsible for program implementation.

**Key roles for Line Management support**

Refer to the Responsibilities section of this chapter for specific SPCC-related roles of Jefferson Lab staff.

Oil spill prevention is the main focus of this program. The general program is presented here and in the SPCC Plan, while specific practices are detailed in SOPs.

Spill control (immediate containment) and countermeasures (to clean up and prevent a recurrence) are the responsibility of *line management*. After identifying a spill/release, the line manager will use the criteria identified later in this chapter (Spill Report and Event section) to determine documentation requirements.

- Spill response procedures as well as the notification forms are located in [Appendix 3510-R1 Spill/Release Response Procedures](#) and [Appendix 3510-R2 Incident Report Form](#).
- If a Notable Event Worksheet is determined to be necessary, line management, with assistance from ESH&Q staff, will complete and distribute the notable event within 2 weeks.

The Facilities Management Director is available, at the request of line management, to coordinate containment and clean up activities for any spills that encounter the ground or any surface water.

ESH&Q Division Industrial Hygiene staff support line management in collecting soil and water samples to assure adequate spill clean up.

The SPCC Coordinator is available to assist line management to carry out the measures outlined in the program.

ESH&Q Division staff arrange collection of all used oil, which is accepted at the Used Oil Storage Shed (UOS). Used-oil recycler transfer operations are also monitored by Accelerator ESH&Q staff.

Line Management oversees all deliveries and/or pickups by petroleum product vendors.

**Spill prevention methods**

- ❖ During the planning stage, the line manager and ESH&Q staff address new or relocated equipment issues concerning placement, secondary containment, and other control issues.
- ❖ Line management, with ESH&Q staff coordination, review sitings of any new oil-containing equipment for proximity to floor drains or surface discharge to minimize potential environmental impacts. If unusual maintenance is required, appropriate mitigating actions will be taken prior to start of work.
- ❖ Facility personnel are trained to ensure that:
  - oil containment trenches are functioning around oil-filled transformers
  - signs of weakness are noted and repaired (including anything that holds or carries fluids, and any additional support structures).
  - transformers are maintained on their pad only
  - subcontractors provide containment when maintaining a transformer without containment trenches

A task hazard analysis is done, as applicable. An Environmental Review, per EMP-04, is completed.



- ❖ Mechanical equipment and oil storage containers with the potential to leak or spill oil are secondarily contained and positioned away from floor and storm drains.
- ❖ Transformers
  - Ground level transformers must be equipped with a direct-reading oil-level gauge.
  - Transformers must be installed on a concrete pad with built-in secondary containment. If vegetable-based oils are used, then alternate approved containment measures must be installed as well.
  - Visual inspections of each transformer are performed and documented at least monthly by the responsible line manager or designee using a SOP that uses the checklist provided in [Appendix EPS 32-T1 SPCC Inspection Checklist](#) for guidance. Inspections of spare transformers and those without secondary containment are performed twice monthly.
  - The written inspection record is provided to the SPCC Coordinator annually.

**Note:** The checklist in the appendix provides a suggested format for equipment inspections. A different form can be used but the items noted must be addressed to the extent that they apply to a particular device

- ❖ Inspections are performed per SOPs. Inspection records for other oil-containing equipment are provided to the SPCC Coordinator upon request. A deficiency report should also be provided annually.
- ❖ Sorbent material shall be prepositioned in areas with mechanical equipment.

Any new or changed experiments must be reviewed using EMP-04A. Changes must be documented in either an existing SOP or by preparing a new SOP. Your ESH&Q Division Representative will assist with this environmental review per EMP-04.



**Know the location of your spill control equipment**

Pressure testing for low pressure applications is identified in SOPs.

- ❖ Bulk used-oil or any outdoor oil or fuel transfer must not be performed during bad weather.
- ❖ Adequate secondary containment must be provided for any mobile or stationary oil container stored outside.
- ❖ Pressure test transfer lines and hoses identified for use in high pressure applications at least annually following a written inspection procedure. Record on an inspection checklist, such as the one found in [Appendix EPS 32-T1 SPCC Inspection Checklist](#), details of an inspection.
- ❖ Identify exit routes for oil spills and ensure they are sealed prior to installation of oil-containing equipment or drums.
- ❖ Do not fill equipment to more than 90% of capacity unless noted otherwise in the SOP for that piece of equipment.

## Spill control practices

- ❖ All floor drains are plugged in areas with significant potential for oil spills or leaks.
- ❖ All used-oil collection sites that cannot be located away from drains must be secondarily contained with curbing or other feasible means.
- ❖ Seal exit routes when no other methods are feasible to prevent spills from leaving the local area:
  - provide temporary seals on floor drains around oil-containing equipment
  - place a sealed cover at any storm drain in the vicinity of an oil or fuel transfer operation
- ❖ Permanent oil-skimming sluice gates shall be in place at the two main storm water channels near the site boundary to prevent oil contamination from leaving the site. These gates are operated twice a year to verify operability.
- ❖ Transformers
  - Transformer containment sumps shall provide adequate volume to hold at least 125% of the contents of the largest transformer in the area. (All but six Jefferson Lab transformers have oil-containment trenches around them.) Transformers using vegetable-based oils shall use spill socks or other measures for containment.
  - Sump pumps are used to keep water pumped out of the trenches. The pumps shall be equipped with safety switches to prevent them from operating when the transformer oil level is low or when the transformer tank ruptures.
  - Sump pumps shall be inspected at least monthly during the associated transformer inspection to ensure proper functioning.

## Spill countermeasures

- ❖ Absorbent materials, such as loose sand, shall be stored at convenient locations on-site for oil spill countermeasures.

## Response procedures for an oil spill or release

Response procedures and other notification requirements are provided in [Appendix 3510-R1 Spill/Release Response Procedures](#) and may vary depending on your level of oil spill response training.

Division-specific SOPs address special conditions and responses that apply in certain work areas. These are beyond the scope of this chapter.

## Spill Report and Notable Event preparation

If the oil spill meets any of the following criteria, then a Spill/Release Report must be completed by the responsible line manager the same day the event is identified or the following day.

- > 1 gallon anywhere, or
- any amount outside a building, or
- any contact with a floor drain or sink drain

The form is provided in [Appendix 3510-R2 Incident Report Form](#).

**In addition, if the oil spill meets any of these criteria, then a Notable Event Worksheet (See *Appendix 5300-T3 Notable Event and Notification Procedure*), shall be prepared by line management with the assistance of ESH&Q staff.**

- > 5 gallons anywhere, or
- any contact with ground, or
- any contact with surface water or storm drain, or
- any contact with floor drain or sink drain

Provide a copy of the Notable Event Worksheet to the Division Safety Officer, the SPCC Coordinator, and the division's Associate Director.

**The Notable Event process includes:**

- ❖ Interviews with the people involved in the incident, any witnesses, the person in charge of the process/equipment involved, and the local safety warden to gain understanding of the event, its cause, and how the response was handled. Refer to Chapter **5200 Incident/Injury Investigation**.
- ❖ Discussion with others involved with similar processes or equipment to identify possible changes to prevent an event recurrence and to relay lessons learned.
- ❖ A written brief shall be attached to the Incident Report form. The brief should detail the cause and response, and include recommended changes to prevent similar incidents. A copy of this should also be provided to the Division's Associate Director.
- ❖ Copies of the Incident Report, including the Notable Event if applicable, should be provided by the responsible line manager to the Division Safety Officer and the SPCC Coordinator.

## **Sharing lessons learned**

After line management consults with division ESH&Q staff and the SPCC Coordinator, the line manager should conduct a briefing on lessons learned for all involved and a memorandum to concerned staff should be issued. This information will be shared with the SPCC Coordinator who will assist with incorporation into the site program.



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Applicable Permits, Reports,  
and Regulatory Guidance

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<u>Document</u>	<u>Master Record</u>	<u>Location</u>
Maintenance Management Program	Facilities Management	VARC (Bldg. 28), Room 56
Jefferson Lab Spill Prevention, Control, and Countermeasure Plan	ESH&Q Division (See <i>Appendix EPS 32-T1 SPCC Plan Distribution List</i> for all locations)	VARC (Bldg. 28), Room 51 ARC (Bldg. 001), Room 602-8
Applicable sections of the Dominion Virginia Power SPCC Plan	SPCC Coordinator	ARC (Bldg. 001), Room 602-8

<u>Document</u>	<u>Master Record</u>	<u>Location</u>
40 CFR 110 Discharge of Oil 40 CFR 112 Oil Pollution Prevention	SPCC Coordinator	ARC (Bldg. 001) , Room 602-8