Glenn Directive Companion (GLDC/GLM)

DIRECTIVE NO.	**GLM-FE-8500.1-22**	**APPROVING AUTHORITY**	
EFFECTIVE DATE:	**09/03/2021**	**NAME:**	Christie Myers
EXPIRATION DATE:	**09/03/2026**	**TITLE:**	Environmental Programs Manager

COMPLIANCE IS MANDATORY

THIS DOCUMENT IS UNCONTROLLED WHEN PRINTED.
Validate prior to use at https://nasa.sharepoint.com/sites/BMSLibrary/

Responsible Office: FE/Environmental Management Office

Title: GRC Environmental Programs Manual—Chapter 22 Aboveground Storage Tanks and Oil-Filled Equipment

1. PURPOSE

This chapter establishes policy and procedures and assigns responsibilities for the installation, use, maintenance, and emergency response related to indoor and outdoor oil-filled equipment, oil storage, and systems that utilize aboveground bulk storage containers.

2. APPLICABILITY

a. This GLM is applicable to all personnel who utilize indoor and/or outdoor equipment, or store 55 gallons or more of oils (including cooking grease) and lubricants at any NASA-controlled, government-owned facility associated with Glenn Research Center (GRC). This includes drum storage, aboveground storage tanks (AST), elevator reservoirs, oil-filled transformers, lubricating systems, gear boxes, heat transfer systems, machining coolant systems, and oil-filled circuit breakers. This also includes mobile equipment such as fuel dewars, transfer tanks, and backup generators, but excludes vehicular use.

b. This GLM is applicable to documents developed or revised after the effective date of this work instruction.

c. In this GLM, all mandatory actions (i.e., requirements) are denoted by statements containing the term "shall." The term "may" denotes a discretionary privilege or permission, "can" denotes statements of possibility or capability, "should" denotes a good practice and is recommended, but not required, "will" denotes expected outcome, and "are/is" denotes descriptive material.

d. In this GLM, all documents citations are assumed to be the latest version, unless otherwise noted.

3. AUTHORITY

a. 29 Code of Federal Regulations (CFR) Part 1910.1200, Occupational Safety and Health Standards, Hazard Communication

b. 40 CFR Part 112, Oil Pollution Prevention

c. 40 CFR Part 122, National Pollutant Discharge Elimination System (NPDES)/Storm Water Permit Regulations

d. Ohio Administrative Code (OAC) 1301:7-7-34, Flammable Combustible Liquids

e. NASA Policy Directive (NPD) 8500.1, NASA Environmental Management

f. NASA Procedural Requirements (NPR) 8553.1 NASA Environmental Management System

g. Glenn Procedural Requirements (GLPR) 8553.1, Glenn Research Center Environmental Management System

4. APPLICABLE DOCUMENTS AND FORMS

a. Steel Tank Institute (STI) SP001 Standard for Inspection of Aboveground Storage Tanks

b. Environmental Management Office (EMO) Aboveground Petroleum Storage Tank Annual Inspection Form

c. Petroleum Storage Tank Monthly Inspection Forms (See Appendix D)

d. Secondary Containment Rain Water Accumulation Inspection and Discharge Log

5. CANCELLATION

This document supersedes GLM-FE-8500.1-14A, Oil Filled Equipment w/Change 1 (4/17/2020) and GLM-FE-8500.1-22A, Aboveground Storage Tanks w/Change 1 (4/17/2020).

6. BACKGROUND

Originally published in 1973 under the authority of Section 311 of the Clean Water Act, the oil pollution prevention regulations set forth requirements for prevention of, preparedness for, and response to oil discharges at specific non-transportation-related facilities. To prevent oil from reaching navigable waters and adjoining shorelines and to contain discharges of oil, the regulation requires these facilities to develop Spill Prevention Control and Countermeasure (SPCC) plans and establish procedures, methods, and equipment requirements.

7. POLICY

It is GRC policy to follow the requirements and recommendations of all relevant federal, state, and local regulations applicable to AST and oil-filled equipment. The complete regulatory texts should be consulted for further details. The following are the authorities that presently regulate environmental aspects of AST at GRC and are incorporated here by reference.

1. Title 40 Code of Federal Regulations (CFR) 122, EPA Administered Permit Programs: The National Pollutant Discharge Elimination System (NPDES). Regulations are applicable to releases of contaminated rain or snow melt from secondary containments into navigable waters of the United States

2. Oil Pollution Prevention, 40 CFR 112

   (1) Applicable to facilities with over 1320 gallons of aboveground oil storage capacity and determined by counting only containers of oil with capacities of 55 gallons or greater

   (2) Facilities subject to this rule must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States or adjoining shorelines

   (3) Provides the policies and procedures to prevent, control, and administer countermeasures to oil spills

8. RESPONSIBILITIES

1. All GRC Personnel

Any person who discovers a spill at GRC's Lewis Field (LF) or Armstrong Test Facility (GRC-ATF) shall immediately notify Emergency Dispatch on a GRC in-house line (911). If using a mobile phone, dial (216) 433-8888 at LF and (419) 621-3222 at GRC-ATF.

2. Spill Prevention, Control, and Countermeasure (SPCC) Coordinator

The SPCC Coordinator implements and maintains the AST and OFE Program at LF and GRC-ATF such that the installations are in compliance with the Oil Pollution Prevention Act.

3. Human Capital Development Division (HCDD) Chief

The HCDD Chief is responsible for the maintenance of training records of GRC personnel for the System for Administration, Training, and Educational Resources for NASA (SATERN) training sessions. Note: Not all contractors utilize SATERN and maintain training records for their personnel.

4. Chemical Management Lead

The Chemical Management Lead within the Safety and Health Division (SHeD) ensures that the requirements of 29 CFR 1910.1200, Hazard Communication, are met with regards to the bulk storage of oil of any kind at either LF or GRC-ATF.

5. Facilities Infrastructure Division Engineering Management Branch (Code FDE)

Code FDE assists in verifying that the design aspects related to the modification, replacement, or repair of existing or new AST systems at LF or GRC-ATF meet the requirements of all applicable federal, state, and local environmental regulations.

6. User Point-of-Contact (UPOC)

The UPOC is responsible for the operation, maintenance, monthly inspections, and overall management of the AST and oil-filled equipment under their use and supervision at either LF or GRC-ATF.

9. REQUIREMENTS

9.1 Oil Pollution Prevention (40 CFR 112)

9.1.1 Annual Training

All personnel who utilize, deliver, and store petroleum-based products shall annually complete the SATERN course number GRC-006-14 for SPCC and AST training.

9.1.2 AST and Piping Integrity Testing

Inspection and testing of AST shall be done as part of a program developed by a licensed professional engineer (PE). The PE determines the appropriate industry standards (i.e., STI SP001) to be applied, consults with facility personnel, and reviews the facility to determine the frequency, type of testing and inspections, and the appropriate qualifications for personnel performing the tests and inspections. The PE considers factors such as type of tanks, age and condition of the tanks, materials contained in the tanks, proximity to waterways, etc. The resulting inspection and testing procedures and schedules are then incorporated into the facility's SPCC plan.

9.1.3 Operator Monthly AST and Oil-Filled Equipment Inspections

The AST and oil-filled equipment operators or designated UPOC shall complete monthly inspections of AST and oil-filled equipment under their responsibility. Inspections shall be documented on the Environmental Management Office (EMO) site-specific monthly inspection forms and be located either at the AST site or other location made known to the SPCC Coordinator. See Appendix D for examples of the monthly and facility inspection forms. Blank forms will be provided by the EMO and completed forms shall be retained by the AST/oil-filled equipment owner/operator for a period of three years.

9.1.4 Secondary Containment (40 CFR 112.7(c))

a. For indoor AST, containment shall be adequately sized to contain 100 percent of the maximum storage capacity or documented operating capacity of the largest AST (if more than one tank in a single containment area).

b. For exterior AST, containment shall be adequately sized to contain 110 percent of the container to account for precipitation, if not a double-walled tank. Containments shall be drained on a frequent basis to maintain the required containment capacity.

c. The EMO shall be notified to complete and document the inspection and emptying of secondary containments susceptible to rain and snow accumulations. A Secondary Containment Rain Water

Accumulation Inspection and Discharge Log form shall be utilized to record the emptying of containments (See Appendix D.5).

d. No GRC personnel shall discharge water accumulations from secondary containments without first receiving EMO approval. All active AST/oil-filled equipment with secondary containment drain valves shall be kept in the closed position and locked if feasible.

9.1.5 Site Spill Response Plan (40 CFR 112.7)

If secondary containment for oil-filled equipment or AST with a capacity of more than 55 gallons is not feasible or practicable then procedures shall be established and documented for a monitoring program to detect equipment failure and/or discharge. A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged shall be developed. The maintenance personnel or operator of the oil-filled equipment shall prepare this detailed plan and it shall be reviewed and approved by the AST Program Lead. Approved plans will be incorporated into the respective location's Integrated Contingency Plan (ICP).

9.1.6 Spill Kits

Spill kits shall be located in line of sight of the AST/oil-filled equipment the kit has been designated for. The AST/oil-filled equipment operators and/or designated UPOCs are required to supply and replenish these spill kits.

9.2 Overfill Protection and Spill Buckets (National Fire Protection Association 30A, 40 CFR 112)

All AST that are periodically replenished shall have a direct-view level gauge, built-in flow restrictor, or overfill alarm present to notify or prevent delivery personnel from overfilling the AST. Measures such as a spill bucket shall be present at the fill ports to contain drips and spills during and after deliveries and the detachment of hose connections.

9.3 Tank and Container Signage (29 CFR 1910.1200, Ohio Fire Code)

All AST shall be properly labeled with the name of the contents, National Fire Protection Association placard or label, a unique tank identification (designated by SPCC Coordinator), UPOC contact info, and emergency contact information.

APPENDIX A. Definitions

Aboveground Storage Tanks. All containers, whether plastic, steel, fiberglass, or other composite, with a storage capacity of 55 gallons or greater utilized for the storage of petroleum-based products such as oils, fuels, greases, and coolants. Pressurized vessels of liquid oxygen, nitrogen, and other similar liquid gases are exempt.

Bulk Storage Containers. Any container used to store oil. These containers are used for purposes including, but not limited to, the storage of oil prior to use, while being used, or prior to further distribution in commerce.

Double-Walled Interstice. Space between the primary tank and the secondary tank to prevent a release from the primary tank from entering the environment. Most have a sight glass or separate level gauge for detecting a release in the interstice.

Impracticability Determination Provision. Per Spill Prevention Control and Countermeasures guidelines, when a facility owner or operator is incapable of installing secondary containment by any reasonable method.

Integrated Contingency Plan. Plan intended to be used by facilities to prepare emergency response plans for responding to releases of oil and non-radiological hazardous substances. The ICP creates one functional emergency response plan by consolidating plans necessary to comply with multiple regulations.

Non-Destructive Examination. The development and application of technical methods to examine materials and/or components in ways that do not impair future usefulness and serviceability in order to detect, locate, measure, interpret, and evaluate flaws in the shell of a tank.

Oil. Oil of any kind or in any form, including but not limited to fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil.

Oil-Filled Equipment. Oil-filled electrical, operating, and manufacturing equipment, excluding bulk storage containers. Examples of oil-filled operational equipment include hydraulic systems, lubricating systems (including those for pumps, compressors, and other rotating equipment), gear boxes, machining coolant systems, heat transfer systems, transformers, other electrical equipment, and other systems containing oil to enable operation.

Secondary Containment. Dikes, containment curbs, pits, pallets with spill bladders, etc., designed to contain a spill or release of oil. Secondary containment should be designed to accommodate the capacity of the largest single container in an area.

Spill Prevention Control and Countermeasure Plan. Facilities subject to 40 CFR 112 must prepare and implement a plan to prevent any discharge of oil into or upon navigable waters of the United States. The SPCC is incorporated into the respective ICPs for both LF and GRC-ATF.

Tank Integrity Test. Test of the shell integrity of an AST by several different means including ultrasound, water tightness, smoke tests, and certified visual inspection following industry standards. All tests are to detect weakness in the tank shell or signs of excessive corrosion and tank shell loss. Steel Tank Institute (STI) SP001 is a typical standard used in integrity testing of AST.

User Point-Of-Contact. The User Point-of-Contact (UPOC) is responsible for the operation, maintenance, and overall management of the oil storage containers and oil-filled equipment under their use and supervision.

APPENDIX B. Acronyms

AST Aboveground Storage Tanks

CFR Code of Federal Regulations

EMO Environmental Management Office

GRC Glenn Research Center

HCDD Human Capital Development Division

ICP Integrated Contingency Plan

NPDES National Pollutant Discharge Elimination System

NDE Non-Destructive Examination

OAC Ohio Administrative Code

OFE Oil Filled Equipment

SHeD Safety and Health Division

SATERN System for Administration, Training, and Educational Resources for NASA

SPCC Spill Prevention, Control and Countermeasure

UPOC User Point-Of-Contact

APPENDIX C. Records

Record Title	Record Custodian
EMO annual AST and oil-filled equipment inspection forms; audit forms	AST Program Lead
Tank and oil-filled equipment site manager designation lists and GRC AST/DRUMS database	AST Program Lead
Tank integrity test results (where applicable)	AST Program Lead
Alarm/gauge testing records	AST Program Lead
Completed annual sets of monthly AST site inspection forms	Designated User-Point-of- Contact
Civil Servant Training Records	HCDD in SATERN
Onsite Contractor Training Records	HCDD in SATERN or Contractor Managed
Offsite Contractor Training Records	Contractor Managed

APPENDIX D. Examples of Forms

D.1 EMO AST/OFE Annual SPCC Inspection Form

NASA Glenn Research Center

EMO Aboveground Storage Tank/Oil Filled Equipment
Annual SPCC Inspection Form

Date of Inspection:_____ EMO Inspector Name:_____

Building No.: Tank Contact:

Tank ID:_____ Tank Descriptor: _____

Tank and Piping Related:	Yes	No	NA
1. NFPA Label, Unique ID, and Tank Content Labeling exist and are appropriate for the product stored?			
2. Tank level gauge is present and is operating or reading tank levels correctly?			
3. Double-walled tanks are free of liquid in the interstice?			
4. Spill baskets on fill ports are free of product, water, and debris?			
5. Tank vents appear unblocked by insect nests, other obstructions, and are free of damage?			
6. The tank is free of excessive corrosion, distortion, and dents or bulging?			
7. The tank is free of signs of leaks, drips, or a potential for release?			
8. The associated piping is free of leaks, damage, wet fittings, bowing, or excessive corrosion?			
9. Tank foundation is free of settling, cracks, or damage by plant roots?			
10. Tank access is free of obstructions and ladders and supports are in satisfactory condition?			
Containment Related:	**Yes**	**No**	**NA**
11. Secondary containment is free of damage or breeches in the containment wall, berm, or curbing?			
12. Secondary containment drain valve is operational and kept in the closed position?			
13. Secondary containment is free of product, water, and/or debris?			
14. Secondary containment is free of equipment or containers that may reduce the size of the containment?			
15. Hazardous or incompatible chemical or product storage is not present in the same containment?			
16. Spill containments with bladders are free obstructions and not deployed?			
Spill / Fire Response Related:	**Yes**	**No**	**NA**
17. Spill Kit is in-line-of-sight of tank or drums and adequately stocked?			
18. Fire Extinguisher is within 30 feet of site and in-line-of-sight or a sign is posted to its location?			
19. Emergency contact information is posted in the building and available to all personnel?			
Operator Related:	**Yes**	**No**	**NA**
20. Operator is completing monthly inspections properly and is keeping them onsite? (If no, provide details)			
21. Operator is addressing leaks, damage, or other noted concerns in a prompt manner?			

See reverse side for additional comments/findings as needed.

Inspector or Supervisor Name & Signature: _____ Date: _____

Records Management: This annual inspection record shall be kept on file with EMO for a minimum of 3 years

D.2 AST/Oil-Filled Equipment

NASA Glenn Research Center

Oil-Filled Equipment Monthly Inspection Form

Building #: _____

Equipment ID or Descriptor: _____

Attention Inspector: Please answer YES (Y or ✔) or No (N or **X**) or Non-Applicable (N/A) for the following questions and state corrective actions to be taken for those items marked with an **N or X**.

Date	Spill Kit Present and Stocked?	Fire Ext. Present?	Tank is free of leaks, corrosion, and bowing?	If applicable, is secondary containment free of damage?	No hazardous or incompatible product is in containment?	Associated piping is free of leaks or drips?	Tank ID Labels and NFPA Placards Present?	Corrective Actions Required? Inspector Initials

D.3 EMO Annual Drum Storage Area Inspection Form

NASA Glenn Research Center

EMO Bulk Storage Containers/Drum Annual SPCC Inspection Form

Date of Inspection: _____ EMO Inspector Name: _____

Building No.: _____ Storage Area Contact: _____

Area Storage Descriptor: _____

Drum and Piping Related:	Yes	No	NA
1. NFPA Label and Content Labeling exist and are appropriate for the product stored?			
2. The container(s) is free of signs of leaks, drips, or a potential for release?			
3. The associated piping is free of leaks, damage, wet fittings, bowing, or excessive corrosion?			
4. Container(s) is undamaged, free of corrosion, and lids or ports are securely fastened?			
5. If level gauges in use, they are in good working condition?			
Containment Related:	**Yes**	**No**	**NA**
6. Secondary containment is free of damage or breeches in the containment wall, berm, or curbing?			
7. Container(s) is in appropriately sized containments or placed on adequately sized spill pallets?			
8. Secondary containment drain valve is operational and kept in the closed position?			
9. Secondary containment is free of product, water, and/or debris?			
10. Secondary containment is free of equipment or containers that may reduce the size of the containment?			
11. Hazardous or incompatible chemical or product storage is not present in the same containment?			
12. Spill containments with bladders are free obstructions and not deployed?			
Spill / Fire Response Related:	**Yes**	**No**	**NA**
13. Spill Kit is in-line-of-sight of tank or drums and adequately stocked?			
14. Fire Extinguisher is within 30 feet of site and in-line-of-sight or a sign is posted to its location?			
15. Emergency contact information is posted in the building and available to all personnel?			
Operator Related:	**Yes**	**No**	**NA**
16. Operator is completing monthly inspections properly and is keeping them onsite?			
17. Operator is addressing leaks, damage, or other noted concerns in a prompt manner?			

See reverse side for additional comments/findings as needed.

Inspector or Supervisor Name & Signature: _____ Date: _____

Records Management: This annual inspection record shall be kept on file with EMO for a minimum of 3 years

D.4 Monthly Inspection Form – Drum Storage Areas

NASA Glenn Research Center

Drum Storage Area (DSA) Monthly Inspection Form

Building #: _____

Drum Storage Area/Room #: _____

Attention Inspector: Please answer YES (Y or ✔) or No (N or **X**) or Non-Applicable (N/A) for the following questions and state corrective actions to be taken for those items marked with an **N or X**.

Date	Spill Kit Present and Stocked?	Fire Ext. Present?	Drum(s) is free of leaks, corrosion, and bowing?	Secondary containment or room berms free of damage?	No hazardous or incompatible product is in containment?	Associated piping is free of leaks or drips?	Drum Content Labels and Present?	Corrective Actions Required? Inspector Initials

D.5 Secondary Containment Rain Water Accumulation Discharge Log Form

GRC Bulk Storage Secondary Containment Discharge Log

Required Per 40 CFR 112.8(c)(3)

SPCC trained personnel shall use this form to log their inspection and discharge of water accumulation within a secondary containment.

For containments with no roofs, inspections shall occur within 24 hours of a 0.5" rain event or snowmelt event.

In the event fuel or an oil sheen is observed in the containment, call (216) 433-8764 to notify the Environmental Management Office.

Date and Time of Inspection	Tank ID	Water Present?	Oil Sheen or Odor Present?	Water Discharged?	Gallons Discharged (estimate)	Any soil erosion at discharge valve?	Discharge valve or opening closed?	Inspector Name and Signature

Form Revised 10/27/2020

CHANGE RECORD

Rev.	Effective Date	Expiration Date	GRC 25, Change Request #	Description
A	4/30/2015	4/30/2020	14-001	• Updated all form links to reflect the NASA Electronic Form portal • Corrected several form names
B			2021-04	• Combined Aboveground Storage Tanks and Chapter 14 Oil-Filled Equipment chapters • Updated roles and responsibilities for EMO and other Organizations • Organized into new template • Added updated inspection form examples

***Include all information for each revision. Do not remove old revision data. Add new rows to table when space runs out by pressing the tab key in the last row, far right column.*