

MINOR CHANGE REQUEST FORM

MCR NO. **ES-MECH-011,R2-003**

(e.g., MCR-ENG-021,R0-001)

The Minor Change Request (MCR) Form is to be used to process Minor, or in some necessary cases, Urgent or Temporary changes to PPPL Lab-wide procedures). The MCR should be used when changes are:

- 1) **minor** and do not warrant further SME review;
- 2) **urgent** and cannot wait the 2-4 week period for further SME review; or
- 3) **temporary**, to revert to original state by a given expiration date (must be within 6 months).

For questions about definitions of “minor,” “urgent,” and “temporary” changes, please review Lab-wide Procedure GEN-001, **Development, Review, and Approval of Lab-wide Documents**.

Person Requesting Change: M. Viola

Phone Ext: 3655

Department Name: Engineering

Document Number: ES-MECH-11

Revision No.: 2

Document Title: Special Purpose Vehicles and Equipment

Reason for change:

Update “Service Report” forms in chapters to include a third requirement check box: “All product recalls and safety improvements have been installed.”

Change description: (Summarize and attach changed pages, with changes clearly indicated)

Added “All product recalls and safety improvements have been installed” as a check box in each “Service Report”

1. Does this change significantly alter the intent or scope of the document? YES: NO: X

2. Does this change significantly impact ES&H? YES: NO: X

If 1 or 2 is YES, explain why the changes should not be submitted as a revision:

3. Place a check mark next to the appropriate type of change request:

- Minor change? X
- Urgent change? (revision must follow within 2 weeks)
- Temporary change?

If “temporary change” is checked, provide expiration date, allowing document to revert to original state (must be within 6 months):

Management System Owner/Designee Approval

Date

Head, PPRM/designee

Date

Release/Effective date of this MCR: 12/3/18

PRINCETON PLASMA PHYSICS LABORATORY		ENGINEERING STANDARD		ES-MECH-011 Rev. 2 Page 1 of 2	
Subject: Special Purpose Vehicles and Equipment		Effective Date:		Initiated:	
		October 3, 2014		Lift Manager	
		Supersedes:		Approved:	
		Rev 1 Dated 5/31/2013		Associate Director, Engineering and Infrastructure	
Chapter 1 Introduction					

MCR ES-MECH-011,R2-003

1.0 SCOPE/APPLICABILITY

This Engineering Standard covers the requirements for the operation of Special Purpose Vehicles (Skid Steer and Backhoe), Utility Vehicles and Special Purpose Equipment (Ditch Witch, Vehicle Attachments and Portable Equipment) while on the PPPL site, equipment inspection, testing, maintenance and the training of operators of these types of equipment. Only trained qualified operators shall operate Special Purpose Equipment at PPPL.

2.0 INTRODUCTION

This Engineering Standard addresses the need to formalize the operation, maintenance, operator training and inspections for Special Purpose Equipment and their attachments. These types of equipment are used in grounds maintenance, building maintenance and material movement.

The operation procedures provided are intended to cover only the basic function for the equipment provided. Operator training would provide additional knowledge to cover other situations. The training required for the various types of equipment in this Engineering Standard varies by type and must be adhered to in order to prevent serious accident or injury.

This standard also covers the acquisition requirements of most types of equipment covered in the Standard.

3.0 REFERENCES

OSHA 29 CFR 1910 Occupational Safety and Health Standards

OSHA 29 CFR 1926 Safety and Health Regulations for Construction

DOE-STD-1090-2011DOE Hoisting and Rigging Standard

ESH 5008 PPPL Safety Manual

ENG-021 Hoisting and Rigging Program

ESH-001 Use of Safety, Accident Prevention, and Equipment Protection Tags

SAE J 49-1980 Specification Definitions Hydraulic Backhoes

ANSI B56.8-2011 Safety Standard for Personnel and Burden Carriers

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011, Rev. 2 Page 2 of 2
Chapter 1 Introduction		

MCR ES-MECH-011,R2-003

3.0 REFERENCES (continued)

SAE J 1042-2003 Operator Protection for General-Purpose Industrial Machines

SAE J 1388-2008 Personnel Protection Skid Steer Loaders

ANSI/NFPA 30 Flammable and Combustible Liquids Code

ANSI/NFPA 505 Fire Safety Standard for Powered Industrial Trucks

Manufacturer's Operating Manuals

ISO 20474-1:2008 Earth-moving machinery - Safety - Part 1: General requirements

ISO 20474-2:2008 Earth-moving machinery - Safety - Part 2: Requirements for tractor-dozers

ISO 20474-3:2008 Earth-moving machinery - Safety - Part 3: Requirements for loaders

ISO 20474-5:2008 Earth-moving machinery - Safety - Part 5: Requirements for hydraulic

PCSA 1: Mobile Crane and Excavator Standards

PCSA 2: Mobile Hydraulic Crane Standards

PCSA 3: Mobile Hydraulic Excavator Standards

4.0 CHAPTERS

1.0 Introduction

2.0 Skid Steer

3.0 Backhoe Loader Vehicles

4.0 Construction and Demolition Equipment

5.0 Attachments and Portable Equipment

6.0 Utility Vehicles

7.0 Procurement

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 1 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

TABLE OF CONTENTS

1.0 INTRODUCTION.....	2
2.0 DEFINITIONS	2
3.0 OPERATIONS	5
4.0 ODCL SIGN OFF SHEET	8
5.0 TRAINING	9
6.0 OPERATOR PERFORMANCE EVALUATION CHECKLIST – SKID STEER	16
7.0 SKID STEER OPERATOR’S CHECKLIST OF TRAINING PROVIDED.....	18
8.0 INSPECTIONS.....	19
9.0 MAINTENANCE AND REPAIR	20
10.0 MODIFICATIONS/ATTACHMENTS.....	23
11.0 RECORDS	24

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 2 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

1.0 INTRODUCTION

The movement of material with the use of a skid steer is a hazardous operation having potential consequences ranging from minor injuries and minor property damage, to fatalities and major property losses if not performed in a safe manner. Reduction of these hazards to risk levels that are acceptable requires the proper design, maintenance, and use of mechanical devices; care and common sense; proper training and supervision; and the careful adherence to approved work and safety procedures.

2.0 DEFINITIONS

Attachment – a device other than the conventional bucket mounted on the elevating mechanism of the skid steer for handling the load. Examples are augers, plows, mixers, etc.

Authorized Person – Personnel approved or assigned to perform a specific type of duty or duties at a specific location or locations at a work site.

Boom – The arms of the skid steer that raise and lower the load/attachment.

Bucket – An attachment used on a skid steer to pick up, carry and unload material. Usually used for loose material such as sand, gravel, stone, etc.

Capacity – The capacity of a skid steer equipped with bucket, or attachments, is the weight at a specified load center that a given skid steer can transport in a carry position and raise to the specified elevation of the load engaging means.

Competent Person (OSHA) – One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them. The link to the PPPL list of OSHA Competent person is <http://spportal.pppl.gov/bp/Lists/PPPL%20Experts/AllItems.aspx>.

Demolition Door – A door mounted to the front of a skid steer, usually with a safety interlock engaged when the door opens, that protects the skid steer operator from debris during normal operation of the skid steer.

Equipment Contact - Individual having physical possession of government personal property items (capital, controlled, other accountable, sensitive, high risk and administratively controlled) charged to their care. Usually reports organizationally or functionally to the custodian.

Equipment Custodian – Individual designated by Division/Department Head or Project Administrator for a particular functional or organizational area of responsibility (usually at section head level or higher). This individual maintains liaison with Material Services Property Management personnel regarding inventories, equipment spot-checks, property loans, intra-lab permanent transfer of property, disposal and other actions/problems regarding equipment within their assigned functional area.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 3 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

Fleet Coordinator – The Fleet Coordinator is the person in the Material Control Group assigned to maintain DOE required documentation regarding the status of all government owned vehicles at PPPL.

FOPS – Falling Object Protection System the screening surrounding the operator’s compartment that protects the operator from falling loads and debris.

Hot Tapping – A disallowed unsafe practice of installing or removing an attachment to a piece of equipment while the equipment is running and/or while the hydraulic or electrical systems required are energized.

Interlock – A control or mechanism that, under specified conditions, automatically allows or prevents the operation of another control or mechanism.

Modification – To make a change to equipment that affects the operation, stability, safety factors, rated load or safety of the Special Equipment or attachment in any way.

Nameplate - The manufacturer’s plate attached to the skid steer that lists the vehicle capacity, approved modifications and attachments and reach under conditions.

OEM – Original Equipment Manufacturer.

Operation – Performance of functions of Special Equipment within the scope of its specifications and in accordance with the manufacturer’s instructions, the PPPL’s work rules and applicable government regulations.

Operator – A qualified person who controls the movement and use of equipment.

Operator’s Daily Check List (ODCL) – The checklist to be used by the operator to inspect the Special Purpose Equipment at the start of every shift and used to log safety and operating issues that arise during the shift. The ODCL will be kept on the machine until shift end and then be given to the Supervisor for filing.

Operator’s Manual – The manual(s) supplied by the manufacturer with operation, inspection, maintenance, repair requirements, and may also include specifications and other information. The manual may only be updated and/or replaced by the Equipment Custodian who will be responsible for the proper distribution of the new manual.

Overhead Guard – an overhead guard is intended to offer protection to the operator from falling objects but not against every possible impact.

Princeton Technical Representative – Individuals designated as PTRs must have successfully completed the following training courses: a. General Employee Training; b. Subcontract Administration for Princeton Technical Representatives; c. Hazard Awareness (JHA training).

Powered Functions – Those which control motion of the Special Purpose Equipment or Attachment and are caused by electro-mechanical, hydraulic or pneumatic forces.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 4 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

Power Plant – Is defined as the power source for a piece of equipment.

Qualified Ground Man – Qualified Skid Steer Operator usually required to work with an active skid steer to monitor and assist the skid steer operator during operations.

Qualified Inspector - An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated an ability to recognize, evaluate and resolve concerns regarding. This function will usually be performed by a Factory Authorized Service Representative.

Qualified Instructor – An individual with experience, training, or education in Systematic Approach to Training (SAT) Methods and presentation techniques. These individuals are capable of developing training courses and materials, approving training courses and materials developed by other instructors, presenting classroom and On-the-Job instruction, evaluating trainees, and evaluating training programs.

Qualified Person – An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated an ability to recognize, evaluate and resolve concerns regarding the specific subject matter.

Qualified Subcontractor - One whose qualifications have either been evaluated and accepted by the Procurement Technical Representative or whose parent company qualification program has been evaluated and accepted by the PTR and the individual carries documentation (e.g. card) which shows completion of approved training.

Rollover Protection (ROPS)– A structure required on all skid steers built after 1972 with a design objective to minimize the likelihood of a complete overturn and thereby minimize the possibility of the operator being crushed as a result of a rollover or upset.

Safety Interlock – A switch used to shut down, lock out and prevent the accidental use of equipment. The interlock by itself does not control all hazardous energy, arms may be in a raised position. The interlock is usually positioned in such a manner as to be engaged when the operator is not in the proper location within the vehicle.

Shall – The word shall is to be understood as being mandatory.

Side Screens – Screens installed on the side windows of a skid steer to prevent the operator from positioning an extremity or head in such a manner as to be exposed to crushing by the side arms.

Subject Matter Expert – An individual with prerequisite background or experience necessary for instructional competency in a specific subject, task, or field of knowledge. Such an individual is qualified by education, training, or experience, and is a recognized expert on a particular subject, task, or system. These individuals are capable of developing training courses and materials, presenting classroom and On-the-Job instruction, and evaluating trainees, within their subject area. The SME for skidsteers is the Lift Manager.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 5 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

3.0 OPERATIONS

3.1 OPERATING PROCEDURE

Responsibility	Action
Skid Steer Operator	<ol style="list-style-type: none"> 1. Identifies the Skid Steer has proper bucket/attachment for the job. 2. Perform, or verify, a daily inspection of the skidsteer using the proper Operator's Daily Check List (ODCL) for the skidsteer to be used following the steps in Section 8.0 of this Chapter including verification that the periodic inspection is current. 3. If bucket/attachment needs to be changed, follow Tag Out procedure (ESH-001) to assure Skid Steer is in a safe condition, change bucket/attachment. 4. Verify the operator is carrying a current qualification card for operating the skidsteer and any attachments to be used and valid driver's license. 5. Perform a daily inspection for the Skid Steer following the requirements listed in Section 8.0 using the ODCL. 6. Perform a function test on the Skid Steer. 7. Confirm the locations the Skid Steer is to be used is suitable for its capabilities. 8. If job function is to remove material from ground, verify that a valid Digging Permit has been obtained.
Skid Steer Operator	<ol style="list-style-type: none"> 9. Approach the material to be moved cautiously. 10. After the bucket is loaded with material lift the load slightly to verify stability of the Skid Steer. 11. Travel with load safely as described in Section 3.2 of this Chapter. 12. Position the bucket in proper location where material is to be placed, tilt bucket slowly as material is being spread. 13. After completion of job perform the Shut Down Procedure per the Operator's Manual. 14. Submit the full Signature Sheet to the Equipment Contact.
Equipment Contact	<ol style="list-style-type: none"> 15. Check skidsteer periodically to assure that completed sign off sheets are turned in. Submits all completed sign off sheets to their supervisor.
Supervisor	<ol style="list-style-type: none"> 16. Signs and send the Signature Sheet to the Operations Center for filing. 17. Periodically check that the ODCL has been performed on the Skid Steer, initial and date the ODCL.

Chapter 2 Skid Steer**MCR-ES-MECH-011,R2-003****3.2 OPERATION REQUIREMENTS**

- A. An ODCL inspection shall be performed before use every day, the ODCL form shall be kept on the skid steer. until the end of the week and given to the supervisor to be filed. If the machine fails the ODCL, the operator shall tag out the machine as described in PPPL Procedure ESH-001.
- B. Only trained and qualified operators carrying a current PPPL Qualification card shall operate a skid steer.
- C. Prior to the operation of any skid steer, the operator shall have read the operator's manual for the particular skid steer and any attachments being operated.
- D. Be sure you are in the operator's seat when you start the engine.
- E. Stay seated with the seatbelt attached when you operate the controls.
- F. All body parts must remain within the skid steer at all times unless entering or exiting the skid steer.
- G. If at any time a skid steer is found to be in need of repair, defective, or in any way unsafe, the skid steer shall be tagged out of service until restored to a safe operating condition as per PPPL Procedure ESH-001.
- H. Fuel tanks shall not be filled with the engine running, refueling must follow the procedure defined in ES-MECH-014, Refueling and Recharging Vehicles and Equipment.
- I. No skid steer shall be operated with a leak in the fuel system.
- J. Equipment custodian shall keep and maintain a copy(ies) of the operating and maintenance manual(s) for the skid steer and all attachments in the weather resistant storage compartment provided by the manufacturer. The manual(s) is (are) considered an integral part of the skid steer and is vital to communicate necessary safety information to users and operators.
- K. Carry your load low. And don't carry items that could easily fall off or roll off.
- L. Avoid sudden stops, starts or turns, always uses a K turn on pavement.
- M. Load, unload and turn on level ground whenever possible.
- N. Don't drive across steep slopes. Drive straight up or down the slope, with the heavy end of the loader pointed uphill and the bucket lowered to the ground.
- O. Always look back when you're operating the skid-steer loader in reverse. Make sure no one is in the way.
- P. Skid steer operator should always work with a Trained Ground Man, any exceptions must be specified in the JHA for the job and approved by the supervisor.
- Q. Don't park a skid steer on a hill or slope.
- R. Never lift, swing or move a load over another person.
- S. Be careful not to overload the bucket as described in the operator's manual and on the bucket ID plate.

Chapter 2 Skid Steer

MCR-ES-MECH-011,R2-003

3.2 OPERATION REQUIREMENTS (continued)

- T. Always be on the lookout for hazards. These include cables, branches, rocks, stumps, ditches and sudden drop-offs.
- U. Stay away from the banks of rivers and the edges of gullies.
- V. Don't wear torn or ripped clothing or clothing with drawstrings.
- W. Entering
 - i. Enter only when the bucket or other attachment is flat on the ground—or when the lift-arm supports are in place. Use supports supplied or recommended by the manufacturer.
 - ii. When entering the loader, face the seat and keep a three point contact with handholds and steps.
 - iii. Never use foot or hand controls for steps or handholds.
 - iv. Keep all walking and working surfaces clear of debris.
- X. Exiting:
 - i. Before leaving the operator's seat, lower the bucket or other attachment flat to the ground—or position the lift-arm supports with help from the Ground Man. Use supports supplied or recommended by the manufacturer.
 - ii. Set the parking brake, and turn off the engine.
 - i. When exiting the loader, face the front and keep a three point contact with handholds and steps.
 - ii. Never use foot or hand controls for steps or handholds.
- Y. Prior to entering or exiting the skid steer, make sure that the safety for the lifting arm is engaged.
- Z. Installing, operating or removing attachments see section 10.0 of this Chapter.
- AA. If a skid steer is to be transported, the operator's shall follow all manufacturers' requirements found in the manuals for the unit.
- BB. Ground Man requirements:
 - i. Wears a safety vest.
 - ii. Wears a hard hat.
 - iii. Is a trained and qualified Skid Steer Operator.
 - iv. Signals Skid Steer Operator when conditions change, approaching a dangerous location or when pedestrians are in the area.
 - v. Assists Skid Steer Operator when installing or removing attachments.
 - vi. Always works facing the skid steer.

MCR-ES-MECH-011,R2-003

4.0 ODCL SIGN OFF SHEET

ODCL INSPECTION SIGN OFF

Equipment: _____

Equipment Contact _____

Prop. #: _____

[illegible]

Note: if the machine does not pass ODCL inspection, tag the machine out of service, do not use the machine and notify supervisor immediately explaining the cause of the failure.

Supervisor Signature_____

Date _____

Send to Operations Center for filing

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 9 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

5.0 TRAINING

5.1 TRAINING AND QUALIFICATION

In order to qualify as a Skid Steer operator, the employee must successfully complete the training. The following requirements must be met:

	Skid Steer Operator
Prerequisite	Valid Driver's License
Initial Classroom Training	Yes
Written Test	Yes
Initial OJT and Practical Evaluation	Yes
3 Year Requalification	Written Test, OJT

Supervisors are responsible to assure that Skid Steer Operators maintain proficiency in the operation of the Skid Steer. Failure to maintain this proficiency will require the Operator to retake the Practical Operations test.

5.2 ATTACHMENT QUALIFICATION

All personnel using skid steer attachments and related components shall be trained and qualified to understand the requirements of the specific equipment operation, safety concerns and daily inspection and shall be qualified skid steer operators.

To become attachment qualified, the operator must have read the operator's manual and have been trained by a qualified instructor showing proper care of usage and safety requirements during hands on training session with the equipment. The operator must also have PPE training to properly identify and use the PPE required for use of the equipment.

A record of trained individuals for each attachment shall be kept by Human Resources.

5.3 TRAINING PROCEDURES

A. INITIAL TRAINING AND QUALIFICATION RESPONSIBILITIES

This section details the training and qualification requirements for Skid Steer Machine Operators. Qualified personnel or trainees shall be at least 18 years old, be able to read and understand the posted warning labels on the skidsteer and be able to understand the Instructor.

Responsibility	Action
Candidate's Supervisor or Manager	1. Determine the qualification required (see examples in Section 5.1) and requests training and qualification of personnel by contacting Human Resources.
Human Resources	2. Select a qualified instructor to provide classroom training, practical training, and required tests, as applicable. [Courses are approved using Procedure TR-001 or outside training approved by Subject Matter Expert.]
	3. Schedule training and makes all necessary logistical arrangements for the training.
	4. Notify the candidate(s) of scheduled training and arranges for practical training, as necessary, verifies that candidate has a valid driver's license.
Candidate	5. Attend the scheduled training course, or arranges to challenge any required training and tests through Human Resources.
	6. Provide lift resume/experience summary, as required, for the qualification sought.
Qualified Instructor	7. Provide the appropriate training and testing. The candidate is evaluated on the Skid Steer machine and each type of attachment to be used and the instructor documents the training on a Performance Evaluation Checklist (see examples in Section 6.0). Sign evaluation.
Human Resources	8. Prepare and maintain a qualification package for each successful candidate.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 11 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

A. INITIAL TRAINING AND QUALIFICATION RESPONSIBILITIES

(continued)

- | | |
|-----------------|--|
| Human Resources | <p>9. Prepare a PPPL Special Purpose Equipment User Qualification Card with the appropriate qualification and expiration date entered on the qualification card PPPL qualifications are valid for a period not to exceed three (3) years from the date of the practical or written test, whichever date is earliest</p> <p>10. Sign the PPPL Qualification Card for Special Purpose Equipment Operators.</p> |
| Human Resources | <p>11. Copy the completed card (both sides) for file, and distributes the card to the individual.</p> <p>12. Maintain training and qualification records.</p> <p>13. Monitor due dates and notifies the individual's manager or supervisor of actions needed to maintain or renew qualifications.</p> |

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 12 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

B. CONTINUING TRAINING AND QUALIFICATION RESPONSIBILITIES

This section outlines the continuing (ongoing) training and qualification requirements for Skid Steer Qualifications listed in Training and Qualifications Requirements, Section 5.1.

Responsibility	Action
Human Resources	<ol style="list-style-type: none"> 1. Notify the individual's supervisor or manager of continuing training and qualification requirements that require completion. <p>NOTE: Initial qualifications are issued for an effective period not to exceed three (3) years, unless otherwise specified or revoked, at which time requalification is required. If it is determined at any time that the capabilities of an individual are not in accordance with the qualifications specified for that job, that individual shall be removed from that job. Such removals shall be handled on a case-by-case basis by the PPPL Lift Manager and the applicable supervisor.</p>
Individual's Supervisor and Manager	<ol style="list-style-type: none"> 2. Notify the individual of these continuing training and qualification requirements (such as medical examinations).
Human Resources	<ol style="list-style-type: none"> 3. Arrange for refresher training and required tests for applicable qualifications, verifies that candidate has a valid driver's license. 4. Schedule practical training and make all necessary logistical arrangements for Skid Steer Operator qualifications. 5. Notify the individual of scheduled practical training.
Individual/Candidate	<ol style="list-style-type: none"> 6. Complete refresher training and challenge tests through Human Resources. Note: Written tests must be current in order to renew Skid Steer Operator Exams.
Qualified Instructor	<ol style="list-style-type: none"> 7. Provide the practical training and evaluation for Skid Steer Operator qualifications and documents it on a Performance Evaluation Checklist (Section 6.0).

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 13 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

B. CONTINUING TRAINING AND QUALIFICATION RESPONSIBILITIES

(continued)

- | | |
|-----------------|---|
| Human Resources | 8. Prepare a PPPL Qualification Card with the appropriate qualifications and expiration date entered on the card. PPPL qualifications are valid for a period not to exceed three (3) years from the date of the practical or written test, whichever date is earliest. Sign the PPPL Qualification Card for Skid Steer Operators. |
| Human Resources | 9. Copy the completed card (both sides) for file, and distribute the card to the individual. |
| | 10. Maintain training and qualification records. |
| | 11. Monitor due dates and notify the individual's manager or supervisor of actions needed to maintain or renew qualifications. |

C. PERFORMANCE EVALUATIONS

1. Performance evaluations are based upon the performance items enumerated in the applicable Performance Evaluation Checklist by a Qualified Instructor.
2. No numerical value is assigned to operational evaluations. The candidate's demonstrations are evaluated by the examiner as "satisfactory" or "unsatisfactory" based upon the following criteria:
 - i. The individual exhibits a basic ability in the performance area.
 - ii. The individual is capable of correctly performing the action after some clarification by the examiner.
3. The job functions demonstrated, the candidate's performance in these demonstrations, and the Instructor's evaluation shall be documented.
4. The operational evaluation score for qualification shall be a composite grade of all individual operational evaluations. The composite score for operational evaluations shall be "satisfactory," with no outstanding "unsatisfactory" items (i.e., 100% of demonstrations must be "satisfactory").

Chapter 2 Skid Steer

MCR-ES-MECH-011,R2-003

5.4 TRAINING SCOPE AND COVERAGE

- A. Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video, written material), practical training (demonstrations performed by the Instructor and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace.
- B. Personnel who have not been trained to operate the skid steer may operate a skid steer for the purposes of training only, and only under the direct supervision of a qualified Instructor. This training should be conducted in an area away from other trucks, obstacles, and pedestrians. Skid Steer Operators must be qualified to operate every attachment they will use.
- C. All operator training and evaluation using the Operator Performance Evaluation Checklist, Section 6.0 of this Chapter, shall be conducted by persons who have the knowledge, training, and experience to train operators and evaluate their competence. Instructor qualifications will be evaluated and documented by Human Resources per TR-005.
- D. The following topics will be covered in the training program where applicable to the operation of the skid steer.
 - i. Operating instructions, warnings, and precautions for the skid steer the operator will be authorized to operate;
 - ii. How to obtain assistance for concerns or questions regarding safe operation of the skid steer;
 - iii. Differences between the skid steer and an automobile;
 - iv. Skid steer controls and instrumentation: where they are located, what they do, and how they work;
 - v. Safety Systems and how they work;
 - vi. Engine or motor operation;
 - vii. Steering and maneuvering, including K turns on pavement;
 - viii. Visibility (including restrictions due to loading);
 - ix. Attachment adaptation, operation, and use limitations;
 - x. skid steer capacity, stability and operating limitations;
 - xi. Any skid steer inspections and maintenance that the operator will be required to perform;
 - xii. Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of skid steer that the employee is being trained to operate.

Chapter 2 Skid Steer

MCR-ES-MECH-011,R2-003

5.4 TRAINING (continued)

- xiii. Surface conditions where the skid steer will be operated;
 - xiv. Composition of loads to be carried and load stability;
 - xv. Load manipulation;
 - xvi. Equipment modification;
 - xvii. Pedestrian traffic in areas where the skid steer will be operated;
 - xviii. Hazardous (classified) locations where the skid steer will be operated;
 - xix. Tagout procedures per PPPL Procedure ESH-001;
 - xx. Ramps and other sloped surfaces that could affect the skid steer's stability;
 - xxi. Closed environments and other areas where insufficient ventilation or poor skid steer maintenance could cause a buildup of carbon monoxide or exhaust;
 - xxii. Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation;
 - xxiii. Safe operation and methods to connect or remove attachments.
- E. Refresher training in relevant topics shall be provided to the operator when:
- i. Every three years, including an evaluation of the operator's performance;
 - ii. The operator has been observed to operate the skid steer in an unsafe manner;
 - iii. The operator has been involved in an accident or near-miss incident;
 - iv. The operator has received an evaluation that reveals that the operator is not operating the skid steer safely;
 - v. A condition in the workplace changes in a manner that could affect safe operation of the skid steer.
- F. Human Resources shall document that each operator has been trained and evaluated by a Qualified Person as required by this Chapter. This qualification documentation shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation. The evaluation shall also indicate which, if any, attachments the operator was qualified for.

Chapter 2 Skid Steer

MCR-ES-MECH-011,R2-003

6.0 OPERATOR PERFORMANCE EVALUATION CHECKLIST – SKID STEER**SPECIAL PURPOSE EARTH MOVING EQUIPMENT OPERATOR PERFORMANCE EVALUATION**

Operator's Name _____ Date _____

Please Print

Instructor _____ Supervisor _____

Please Print

Please Print

*For each statement below, check either S (Satisfactory) or U (Unsatisfactory)***S U****1. Performed Operator's Daily Check List including functional test(s)****a. Read and understood warning labels on skid steer****2. Started skid steer properly****a. Used correct steering technique for machine****b. Controlled inching****c. Maintained proper lowering control****d. Maintained proper lift control****3. Demonstrated proper maneuvering skills:****a. Started skid steer smoothly****b. Approached work properly****c. Lifted load properly and squarely****d. Unloaded/placed load properly****e. Traveled with load at proper height****f. Traveled with load safely up and downhill****g. Performed both forward and reverse turns****h. Performed K turn properly****i. Maintained proper speed****j. Looked in direction of travel****k. Carried bucket or attachment in proper position****l. Cleared obstacles by safe distance****m. Demonstrated acceptable depth perception****n. Demonstrated acceptable auditory skills**

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 17 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

6.0 Operator Performance Evaluation Checklist – Special Purpose Equipment (continued)

<i>For each statement below, check either S (Satisfactory) or U (Unsatisfactory)</i>		
	S	U
4. Drove in reverse properly	_____	_____
5. Parked unloaded skid steer correctly	_____	_____
6. Used proper position of all controls, switches, parking brakes when machine was left unattended	_____	_____
7. Mounted and dismounted properly	_____	_____
8. Refueled skid steer properly	_____	_____
9. Attachment _____	_____	_____
a. Correctly mounted attachment	_____	_____
b. Properly performed function of attachment	_____	_____
c. Correctly removed attachment	_____	_____
10. Attachment _____	_____	_____
a. Correctly mounted attachment	_____	_____
b. Properly performed function of attachment	_____	_____
c. Correctly removed attachment	_____	_____
11. Attachment _____	_____	_____
a. Correctly mounted attachment	_____	_____
b. Properly performed function of attachment	_____	_____
c. Correctly removed attachment	_____	_____
12. Operator Performance	_____	_____

Restrictions:

Comments:

Approved By: _____

TR-Form-50 REV 0 2/2013

Instructor's Signature

Chapter 2 Skid Steer

MCR-ES-MECH-011,R2-003

7.0 SKID STEER OPERATOR'S CHECKLIST OF TRAINING PROVIDED

Operator's Name _____ Date _____
Please Print

To be completed after all training is finished

Training Point	Covered	Not Covered
1. Operating instructions, warnings, and precautions for the skid steer the operator will be authorized to operate		
2. How to obtain assistance for concerns or questions regarding safe operation of the skid steer		
3. Differences between the skid steer and an automobile		
4. Skid steer controls and instrumentation: where they are located, what they do, and how they work		
5. Safety Systems and how they work		
6. Engine or motor operation		
7. Steering and maneuvering, including K turns on pavement		
8. Visibility (including restrictions due to loading)		
9. Attachment adaptation, operation, and use limitations		
10. Skid steer capacity, stability and operating limitations		
11. Any skid steer inspections and maintenance that the operator will be required to perform		
12. Fueling		
13. Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of skid steer that the employee is being trained to operate		
14. Surface conditions where the skid steer will be operated		
15. Composition of loads to be carried and load stability		
16. Load manipulation		
17. Equipment modification		
18. Pedestrian traffic in areas where the skid steer will be operated		
19. Hazardous (classified) locations where the skid steer will be operated		
20. Ramps and other sloped surfaces that could affect the skid steer's stability		
21. Closed environments and other areas where insufficient ventilation or poor skid steer maintenance could cause a buildup of carbon monoxide or exhaust		
22. Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation		
23. Safe operation and methods to connect or remove attachments		

I confirm that these items were presented in the training

Operator's Signature _____

TR Form 50A 9/2012

Chapter 2 Skid Steer

MCR-ES-MECH-011,R2-003

8.0 INSPECTIONS**A. DAILY INSPECTIONS**

Before use each day or at the beginning of each shift, the skid steer shall be given an Operator's Daily Check List inspection consisting of visual inspection and functional tests including but not limited to the following:

- i. Safety systems including interlocks
- ii. Current Monthly Inspection, the inspection is not current (date of last inspection within the last 30 days), the operator shall tag out the skid steer in accordance with PPPL Procedure ESH-001 until the inspection is current.
- iii. Fuel level
- iv. Engine oil level
- v. Hydraulic oil level and hoses
- vi. Coolant level and hoses
- vii. Remove dirt and debris from radiator
- viii. Function of controls
- ix. Tires and tire air pressure
- x. Loose or missing parts
- xi. Any manufacturer specified parts
- xii. The daily ODCL shall be maintained in holders installed on the skid steer. The ODCL inspector will sign the Signature Sheet at the completion of the inspection if there are no concerns. The Signature Sheet will be given to the skidsteer's Contact's Supervisor when full. The Supervisor will send the Sheet to the Operations Center for record keeping.
- xiii. ODCL's will be maintained by Material Services, changes may be authorized by the Subject Matter Expert see Attachment 1. The inspections required due to changed frequency approved by the SME, will be noted on the ODCL signature Sheet as an inspection of that frequency (monthly).

A complete listing of Operator's Daily Check Lists for all equipment may be found at the follow site:

<https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/>

If during the inspection of the skid steer it is found to be in need of repair or becomes unsafe in any way, it shall be reported to the operator's supervisor immediately and the skid steer shall be tagged out, in accordance with PPPL Procedure ESH-001, and not be operated until repaired and restored to a safe operating condition. The Operator's Supervisor will contact the Princeton Technical Representative for service.

B. FREQUENT AND ANNUAL INSPECTIONS

Frequent and Annual inspections shall be made based on the manufacturer's requirements specified in the manual provided by the manufacturer. These inspections must be conducted by a Qualified Subcontractor. All inspection reports shall be given to the Fleet Coordinator for filing.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 20 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

9.0 MAINTENANCE AND REPAIR

Note: No modifications or additions which affect the capacity or safe operation of the skid steer shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly [29 CFR 1926.602(c)(ii)].

A. REQUIREMENTS

- i. Maintenance shall be performed according to the manufacturer's recommendations and as a minimum shall meet the requirements of OSHA, 29 CFR 1910, 29 CFR 1926, ESH-001.
 - a. Power plant shall be stopped and starting means rendered inoperative.
 - b. All controls in the off position and all operating systems secured from inadvertent motion by brakes, blocks or other means.
 - c. Elevating boom lowered to the full down position or otherwise secured by supports to prevent dropping.
 - d. Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
 - e. Other manufacturer specified precautions.
- ii. A scheduled planned maintenance, lubrication and inspection system shall be followed based on the manufacturer's recommendations.
- iii. Prior to the commencement of any service or repair, the skidsteer shall be turned off with the key removed and in the possession of the repairman. Any potential energy (such as raised arms) shall be blocked or restrained. (Per OSHA response regarding 1910.147 - 9/27/95) Any sources of hydraulic pressure shall be removed or released. If the service or repair requires work in the engine compartment, then the skidsteer battery cable shall be disconnected (Cable shall be tagged with a Danger Tag if service person must be away from unit.
- iv. Only qualified, trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect the skid steer.
- v. Unusual maintenance or repairs require consultation with the manufacturer.
- vi. All parts requiring replacement shall be replaced only by OEM parts equivalent as to the safety of those used in the original design.
- vii. Skid steers shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts.
- viii. Repaired skid steers shall be inspected using the ODCL and the Service Report prior to being returned to service by qualified inspectors or sub contractors. The service

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 21 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

report will be signed by the inspector and the PTR and be given to the Fleet Coordinator to be filed in the skid steer's file.

- ix. Safety switches and functionality shall not be impaired by service technicians unless required for the repair operation. Such impaired skid steers shall be tagged as out of service until the safety impairment is removed.

B. PROCEDURE FOR OBTAINING MAINTENANCE AND REPAIR FOR A SKID STEER

Responsibility	Action
Equipment Custodian	1. Know where skid steer is at all times and provide skid steer for inspection.
Fleet Coordinator	2. Maintain the inspection records for periodic inspection/maintenance.
Lift Manager	3. Maintain due date to inspect skid steer annually on Inspection Status List. If the maintenance or inspection is not completed the skid steer shall be CAUTION tagged OUT OF SERVICE until such time as the required actions are completed, per PPPL Procedure ESH-001.
Lift Manager	4. Determine if skid steer is to be kept in service. <ol style="list-style-type: none"> a. If skid steer is not to be kept in service, Equipment Custodian to CAUTION tag item OUT OF SERVICE as per PPPL Procedure ESH-001.
Fleet Coordinator	5. A scheduled planned maintenance, lubrication, and inspection system shall be followed using the manufacturer's recommendations. At a minimum, an annual inspection shall be performed using the form found for each piece of equipment listed at: https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/ . More frequent inspections may be required based on the equipment's usage and hour meter as determined by the equipment contact and SME.
	6. Arrange for a qualified skid steer inspector or a qualified subcontractor to perform the inspection/maintenance. (Annual PM or repair service) and obtains name of service repairman.
	7. Verifies repairman is qualified on the contract and submits site notification for repairman by name.
	8. Upon arrival, provides repair man with the annual maintenance schedule from https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/
	9. Directs repairman to PTR or designated escort (qualified operator).

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 22 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

- | | |
|--|---|
| Princeton Technical Representative (PTR) or designated escort (Qualified operator) | <p>10. Directs repairman to equipment.</p> <p>11. Assures that repairman performs ODCL first.</p> <p>12. Verifies that repairman is using our annual maintenance schedule.</p> |
| Princeton Technical Representative (PTR) or designated escort (Qualified operator) | <p>13. Observes that repairman is performing work safely and observing the MAINTENANCE AND REPAIR REQUIREMENTS listed in 9.A.
 NOTE: repairman must remove battery cable before working in engine compartment
 NOTE: tag unit out if unit is to be left unattended during service or the service cannot be completed that day.</p> <p>14. Verifies that repairman uses OEM parts when needed.</p> |
| Qualified Subcontractor | <p>15. Perform required skid steer maintenance per the manufacturer's recommendations and periodic inspection as per the skid steer Inspection Criteria (Section 8.0 of this Chapter) under observation of PTR or their technically qualified designee.</p> <p>Note: Prior to the commencement of any service or repair, the skidsteer shall be turned off with the key removed and in the possession of the repairman. Any potential energy (such as raised arms) shall be blocked or restrained. (Per OSHA response regarding 1910.147 - 9/27/95) Any sources of hydraulic pressure shall be removed or released. If the service or repair requires work in the engine compartment, then the skidsteer battery cable shall be disconnected (Cable shall be tagged with a Danger Tag if service person must be away from unit.)</p> <p>16. Record the inspection/maintenance on the appropriate Inspection Report. Complete Service Report (Attachment 2) while onsite, sign it and give it to the PTR or their technically qualified designee.</p> <p>17. Perform a final inspection with the ODCL, sign Signature Sheet.</p> |
| PTR or Designee | <p>18. Upon completion of work determine if deficiencies are found.</p> <p style="margin-left: 20px;">a. If no, sign and submit service report to Fleet Coordinator, copy to the PTR, and affix inspection sticker, showing expiration date to the skid steer, and to the attachment if so equipped.</p> <p style="margin-left: 20px;">b. If yes, sign and submit service report to Fleet Coordinator, copy to PTR, and apply CAUTION tag OUT OF SERVICE per PPPL Procedure ESH-001.</p> |

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 23 of 24
Chapter 2 Skid Steer		

MCR-ES-MECH-011,R2-003

19. Upon completion of work verifies that repairman performs final ODCL and safety check and assures proper operation of all safety or warning devices.
 20. Checks repair documentation and signs service forms.
 21. Upon completion of work directs repairman back to fleet coordinator.
- Fleet Coordinator
22. Upon receipt of invoice compares invoice to service report and contract to assure it is correct and recommends/approves invoice.
 23. Review and file all service reports and update inspection status list.
Note: Maintenance/Inspection Reports are maintained for the life of the skid steer.
 24. Return to step 2 for each skid steer.
- Equipment Contact
25. Schedule a monthly skid steer inspection and record inspection on ODCL form, ODCL forms are filed with the Operations Center.
Note: Monthly ODCL's will be maintained for the life of the vehicle.

10.0 MODIFICATIONS/ATTACHMENTS

- A. Skid steers shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts.
- B. If modifications may degrade or have deleterious effects on safety features safe operations, then Engineering approval is needed. Added safety features such as back-up beepers would not need Engineering approval.
- C. Operators must have PPPL Qualification for each attachment they will use prior to operating the attachment.
- D. No modifications or additions which affect the capacity or safe operation of the skid steer will be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly [29 CFR 1926.602(c)(ii)].
 1. Alterations to skid steer may be made without manufacturer's approval if the manufacturer no longer exists, or if the manufacturer is unresponsive for more than a year, with the Subject Matter Expert's approval of the change and the concurrence of a Professional Engineer (Attachment 1).
- E. Operating Manuals for all approved attachments shall be kept with the skid steer at all times.
- F. Skid steer must be shutdown and deenergized prior to attaching or removing attachments:

Chapter 2 Skid Steer

MCR-ES-MECH-011,R2-003

- i. Park machine safely.
 - ii. Remove key.
 - iii. Block lift arms if not in full down position.
 - iv. Chock wheels in both directions.
 - v. Do not have others start procedure until machine is de-energized.
 - vi. "Hot Tapping" is NOT allowed.
 - vii. Follow manufacturers' instruction for installing/removing attachment.
- G. Attaching hydraulic lines between attachments and skid steer:
- i. Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
 - ii. Install quick-disconnect couplers on attachment hoses to quick-disconnect couplers on skid steer.
 - iii. Enter skid steer, fasten seat belt, and start engine.
 - iv. Slowly cycle the auxiliary control handle several times to purge system of air and check for proper hydraulic connection.
- Note: Use a piece of cardboard to check for leaks, hydraulic fluid under pressure can enter the skin causing serious injury requiring immediate medical attention.**
- v. With the attachment in a static position, check the hydraulic oil level of the skid steer. Fill to operating level as necessary.

IMPORTANT: Avoid damage! To prevent hydraulic lines from being pinched, be sure hoses rest between step and skid steer torque tube.

WARNING: Serious injury or death is possible if safe practices are not followed when installing or removing attachments.

11.0 RECORDS

- A. Inspection reports shall be maintained by Material Services.
- B. Non-destructive examination reports shall be prepared by the contractor and retained by Material Services.
- C. Records shall be retained in the Material Services Transportation Services master files for the life of the equipment while at PPPL.

ATTACHMENTS:

- 1. ODCL Change Request Form and Equipment Alteration Request Form
- 2. Service Report

Request to move inspection item from Daily to Monthly

Equipment Type _____

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Item to be moved	Reason for move	Frequency of Inspection item is moved to

Requested By: _____ Date _____

Approved by: _____ Date _____
Subject Matter ExpertComments _____
_____Distribution: _____, _____, _____
_____, _____, _____

Approved form to be filed by Material Services with the ODCL Masters

Revised 4/2/13

**Chapter 2 Skid Steer - Request to Alter Equipment with
Engineering Decision**

Page 2 of 2

MCR-ES-MECH-011,R2-003

Request to Alter Equipment with Engineering Decision

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Provide detail of changes/modifications requested and reasons:

Requested by: _____ Date _____

Approved by: _____ Date _____

Subject Matter Expert

Approved by: _____ Date _____

Professional Engineer

Comments _____

Distribution: _____, _____, _____

Approved form to be filed by Material Services in equipment file

Revised 2/12/13

Chapter 2 Skid Steer - Service Report

MCR-ES-MECH-011,R2-003

PPPL Equipment Service Report

To be completed by PPPL	Equipment Type _____ Date _____
	Manufacturer _____ Model _____
	Serial Number _____
	Property Number _____
To be completed by Service Technician	Equipment Problem/Service Requested: _____ Requestor: _____ -

To be completed by Service Technician	Work/Service Performed and comments:

When service work has been completed:

1. Perform Operator's Daily Checklist Inspection
2. Every Inspection – Check that all safety devices, interlocks, lights and alarms are functioning properly
3. All product recalls and safety improvements have been installed.

Sat	Unsat
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

NOTE: Any and all malfunctioning safety devices, interlocks, lights and alarms must be brought to the immediate attention of the PPPL escort regardless of the nature of the service call.

Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL)
INSPECTOR (PRINT): _____ SIGNATURE: _____ DATE: _____
Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL – TAGGED OUT, PTR NOTIFIED)
Escort (PRINT): _____ SIGNATURE: _____ DATE: _____

This form must be completed at end of service call, give to Fleet Coordinator, copy to PTR

MCR-ES-MECH-011,R2-003

Additional writing space on reverse

MCR-ES-MECH-011,R2-003

[illegible]

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 1 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

TABLE OF CONTENTS

1.0 INTRODUCTION	2
2.0 DEFINITIONS.....	2
3.0 OPERATIONS.....	6
4.0 ODCL SIGN OFF SHEET	10
5.0 TRAINING	11
6.0 INSPECTIONS	14
7.0 MAINTENANCE AND REPAIR	16
8.0 MODIFICATIONS/ATTACHMENTS	19
9.0 RECORDS	20

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 2 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

1.0 INTRODUCTION

The movements of materials and/or excavating with the use of a backhoe/loader are hazardous operations having potential consequences ranging from minor injuries and minor property damage, to fatalities and major property losses if not performed in a safe manner. Reduction of these hazards to risk levels that are acceptable requires the proper design, maintenance, and use of mechanical devices; care and common sense; proper training and supervision; and the careful adherence to approved work and safety procedures including the oversight of excavations by an OSHA Competent Person.

2.0 DEFINITIONS

Accepted Engineering Practices – Those requirements which are compatible with standards of practice required by a Registered Professional Engineer.

Attachment – a device other than the conventional bucket mounted on the elevating mechanism of the backhoe/loader for handling the load. Examples are augers, plows, mixers, etc.

Authorized Person – Personnel approved or assigned to perform a specific type of duty or duties at a specific location or locations at a work site.

Bell Bottom Pier Hole – A type of shaft or footing excavation the bottom of which is made larger than the cross section above to form a bellied shape.

Benching – A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels of steps, usually with vertical or near vertical surfaces between the levels.

Bucket – An attachment used on the front of a backhoe/loader to pick up, carry and unload material. Usually used for loose material such as sand, gravel, stone, etc. The bucket on the backhoe is used for digging, filling and rough grade work. Buckets used for lifting shall have proper attachment points for the rigging as identified by the manufacturer.

Capacity – The capacity of a backhoe/loader is the weight, at a specified load center, that a given backhoe/loader can transport in a carry position and raise to the specified elevation of the load engaging means.

Cave-in – A separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system and its sudden movement into the excavation either by falling or sliding in sufficient quantity that it could entrap, bury or otherwise injure and immobilize a person.

Competent Person (OSHA)– One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them. The link to the PPPL list of OSHA Competent person is <http://spportal.pppl.gov/bp/Lists/PPPL%20Experts/AllItems.aspx>.

Cross-brace – The horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 3 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

Digging Permit – A permit required by ENG-024 prior to digging deeper than 12 inches that provides assurance that underground utilities will not be breached during the dig.

Excavation – Any man made cut, cavity, trench or depression in an earth surface, formed by earth removal.

Equipment Contact - Individual having physical possession of government personal property items (capital, controlled, other accountable, sensitive, high risk and administratively controlled) charged to their care. Usually reports organizationally or functionally to the custodian.

Equipment Custodian – Individual designated by Division/Department Head or Project Administrator for a particular functional or organizational area of responsibility (usually at section head level or higher). This individual maintains liaison with Material Services Property Management personnel regarding inventories, equipment spot-checks, property loans, intra-lab permanent transfer of property, disposal and other actions/problems regarding equipment within their assigned functional area.

Faces – The vertical or inclined earth surfaces of an excavation.

Fleet Coordinator – The Fleet Coordinator is the person in the Material Control Group assigned to maintain DOE required documentation regarding the status of all government owned vehicles at PPPL.

Hot Tapping – A disallowed unsafe practice of installing or removing an attachment to a piece of equipment while the equipment is running and/or while the hydraulic or electrical systems required are energized.

Interlock – A control or mechanism that, under specified conditions, automatically allows or prevents the operation of another control or mechanism.

Kick-out – The accidental release or failure of a cross-brace.

Modification – To make a change to equipment that affects the operation, stability, safety factors, rated load or safety of the Special Equipment or attachment in any way.

Nameplate - The manufacturer's plate attached to the backhoe/loader that lists the vehicle capacity, approved modifications and attachments and reach under conditions.

OEM – Original Equipment Manufacturer.

Operation – Performance of functions of Special Purpose Equipment within the scope of its specifications and in accordance with the manufacturer's instructions, the PPPL's work rules and applicable government regulations.

Operator – A qualified person who controls the movement and use of equipment.

Operator's Daily Check List (ODCL) – The checklist to be used by the operator to inspect the Special Purpose Equipment at the start of every shift and used to log safety and operating issues that arise during the shift. The ODCL will be kept on the machine until shift end and then be given to the Supervisor for filing.

Operator's Manual – The manual(s) supplied by the manufacturer with operation, inspection, maintenance, repair requirements, and may also include specifications and other information.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 4 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

The manual may only be updated and/or replaced by the Equipment Custodian who will be responsible for the proper distribution of the new manual.

Overhead Guard – an overhead guard is intended to offer protection to the operator from falling objects but not against every possible impact.

Powered Functions – Those functions which control motion of the Special Purpose Equipment or Attachment and are caused by electro-mechanical, hydraulic or pneumatic forces.

Power Plant – Is defined as the power source for a piece of equipment.

Princeton Technical Representative – Individuals designated as PTRs must have successfully completed the following training courses: a. General Employee Training; b. Subcontract Administration for Princeton Technical Representatives; c. Hazard Awareness (JHA training).

Protective System – A method of protecting employees from cave-ins from material that could fall or roll into an excavation face, or into an excavation or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems and other systems that provide the necessary protection.

Qualified Ground Man – Individual who is sufficiently familiar with the ground operations around special purpose equipment to recognize the hazards associated with special purpose equipment operation. If required to rig loads for lifting must also have a Rigger's qualification.

Qualified Inspector - An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated an ability to recognize, evaluate and resolve concerns regarding. This function will usually be performed by a Factory Authorized Service Representative.

Qualified Instructor – An individual with experience, training, or education in Systematic Approach to Training (SAT) Methods and presentation techniques. These individuals are capable of developing training courses and materials, approving training courses and materials developed by other instructors, presenting classroom and On-the-Job instruction, evaluating trainees, and evaluating training programs.

Qualified Person – An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated an ability to recognize, evaluate and resolve concerns regarding the specific subject matter.

Qualified Subcontractor - One whose qualifications have either been evaluated and accepted by the Procurement Technical Representative or whose parent company qualification program has been evaluated and accepted by the PTR and the individual carries documentation (e.g. card) which shows completion of approved training.

Registered Professional Engineer – A person who is registered as a professional engineer in the state where the work is to be performed.

Rollover Protection (ROPS)– A structure required on all backhoe/loaders built after 1972 with a design objective to minimize the likelihood of a complete overturn and thereby minimize the possibility of the operator being crushed as a result of a rollover or upset.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 5 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

Safety Interlock – A switch used to shut down, lock out and prevent the accidental use of equipment. The interlock by itself does not control all hazardous energy, arms may be in a raised position. The interlock is usually positioned in such a manner as to be engaged when the operator is not in the proper location within the vehicle.

Shall – The word shall is to be understood as being mandatory.

Sheeting – The members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

Shield – a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure.

Shoring System – A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

Subject Matter Expert – An individual with prerequisite background or experience necessary for instructional competency in a specific subject, task, or field of knowledge. Such an individual is qualified by education, training, or experience, and is a recognized expert on a particular subject, task, or system. These individuals are capable of developing training courses and materials, presenting classroom and On-the-Job instruction, and evaluating trainees, within their subject area. The SME for backhoes is the Lift Manager

Trench – A narrow excavation (in relation to length) made below the surface of the ground. In general, the depth is greater than the width, but the width is not greater than 15 feet measured at the bottom.

Wales – Horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 6 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

3.0 OPERATIONS

3.1 OPERATING PROCEDURE

Responsibility	Action
Backhoe/loader Operator	<ol style="list-style-type: none"> 1. Verify the operator is carrying a current qualification card for operating the backhoe and any attachments to be used and valid driver's license. 2. Perform a daily inspection following the requirements listed in Section 6.0 for the Backhoe/loader using the ODCL. 3. Perform a function test on the Backhoe/loader. 4. Confirm the locations the Backhoe/loader is to be used is suitable for its capabilities. 5. If job function is to remove material from ground, verify that a valid Digging Permit has been obtained per ENG-024. 6. Digging and trenching operations using a backhoe/loader require an OSHA Competent Person (OSHA 1926 Subpart P) involvement to review the soil qualities. 7. Approach the material to be moved cautiously. 8. After the bucket is loaded with material lift the load slightly to verify stability of the Backhoe/loader. 9. Travel with load safely as described in Sections 3.2 and 3.4 of this Chapter. 10. Position the bucket in proper location where material is to be placed, tilt bucket slowly as material is being spread.
Ground Man	<ol style="list-style-type: none"> 11. Looks out for backhoe movement and keeps others from walking or standing in backhoe working envelop.
Backhoe/loader Operator	<ol style="list-style-type: none"> 12. After completion of job perform the Shut Down Procedure. 13. Submit the full ODCL signature sheet to the Equipment Contact.
Equipment Operator	<ol style="list-style-type: none"> 14. Check backhoe periodically to assure that completed sign off sheets are turned in. Submits all completed sign off sheets to their supervisor.
Supervisor	<ol style="list-style-type: none"> 15. Signs and sends the ODCL Signature Sheet to the Operations Center for filing. 16. Periodically check that the ODCL has been performed on the Backhoe/loader, initial and date the ODCL.
Fleet Coordinator	<ol style="list-style-type: none"> 17. Schedule Backhoe/loader for required inspections.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 7 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

3.2 OPERATION REQUIREMENTS

- A. An ODCL inspection shall be performed following the requirements listed in Section 6.0 before use every day, the ODCL form shall be kept on the backhoe.
- B. The backhoe/loader operator shall perform the daily lubrication requirements prior to operating the machine.
- C. Only trained and qualified operators carrying a current PPPL Qualification card shall operate a backhoe/loader.
- D. Prior to the operation of any backhoe/loader, the operator shall have read the operator's manual for the particular backhoe and any attachments being operated.
- E. Prior to the use of the backhoe, the need for a digging permit shall be reviewed, and if necessary a permit acquired, following the procedure in ENG-024.
- F. Operator must be in the operator's seat when starting the engine.
- G. The Operator shall stay seated with the seatbelt attached when operating the controls.
- H. All body parts must remain within the backhoe at all times unless entering or exiting the backhoe.
- I. If at any time a backhoe/loader is found to be in need of repair, defective, or in any way unsafe, the backhoe/loader shall be tagged out of service until restored to a safe operating condition as per PPPL procedure ESH-001. The Operator shall notify their supervisor who shall notify the Princeton Technical Representative (PTR) to schedule service.
- J. Fuel tanks shall not be filled with the engine running, refueling must follow the procedure defined in ES-MECH-014, Refueling and Recharging Vehicles and Equipment.
- K. No backhoe/loader shall be operated with a leak in the fuel system.
- L. Equipment custodian shall keep and maintain a copy(ies) of the operating and maintenance manual(s) for the backhoe/loader and all attachments in the weather resistant storage compartment provided by the manufacturer. The manual(s) is (are) considered an integral part of the backhoe/loader and is vital to communicate necessary safety information to users and operators.
- M. Carry load low, and don't carry items that could easily fall off or roll off.
- N. Avoid sudden stops, starts or turns.
- O. Load, unload and turn on level ground whenever possible.
- P. Don't drive across steep slopes. Drive straight up or down the slope, with the heavy end of the backhoe/loader pointed uphill and the bucket lowered to the ground.
- Q. Always look back when operating the backhoe/ loader in reverse. Make sure no one is in the way.
- R. All trenching work requires the oversight of an OSHA Competent Person (OSHA 1926 Subpart P) to assure safe conditions within the trench.
- S. Don't park a backhoe/loader on a hill or slope.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 8 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

- T. Never lift, swing or move a load over another person.
- U. Be careful not to overload the bucket as described in the operator's manual and on the bucket ID plate.
- V. Always be on the lookout for hazards. These include cables, branches, rocks, stumps, ditches and sudden drop-offs.
- W. Stay away from the banks of rivers and the edges of gullies.
- X. Don't wear torn or ripped clothing or clothing with drawstrings.
- Y. Entering
 - i. Enter only when the bucket is flat on the ground.
 - ii. When entering the loader, face the machine and keep a three point contact with handholds and steps.
 - iii. Never use steering wheel, foot or hand controls for handholds.
 - iv. Sit in the Operator's seat, adjust the seat for proper control and fasten the seat belt.
 - v. Keep all walking and working surfaces clear of debris.
- Y. Exiting:
 - i. Before leaving the operator's seat, lower the bucket or other attachment flat to the ground.
 - ii. Shift to neutral.
 - iii. Set the parking brake, and turn off the engine after cool down period.
 - i. When exiting the loader, face the machine and keep a three point contact with handholds and steps.
 - ii. Never use steering wheel, foot or hand controls for handholds.
- Z. After exiting the backhoe, make sure that the safety wheels are chocked if on incline.
- AA. Installing, operating or removing attachments see section 8.0 of this Chapter.
- BB. If a backhoe/loader is to be transported or towed, the operator's shall follow all manufacturers' requirements found in the manuals for the unit.
- CC. Backhoe/loader operator should always work with a Qualified Ground Man, any exceptions must be specified in the JHA for the job and approved by the supervisor.
- DD. Ground Man requirements:
 - i. Wears a safety vest.
 - ii. Wears a hard hat.
 - iii. Is a trained and qualified Backhoe/loader Operator.
 - iv. Signals Backhoe/loader Operator when conditions change, approaching a dangerous location or when pedestrians are in the area and during lifts.
 - v. Performs the rigging required to lift objects using the backhoe/loader.
 - vi. Always works facing the backhoe/loader.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 9 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

3.3 LIFTING WITH THE BACKHOE/LOADER

It may be necessary within the normal operation of a backhoe/loader to need to move material or equipment or to position objects such as pipe into a trench. The following list of requirements must be met to perform this function.

- A. Chains are the preferred tool to use for lifting with a backhoe/loader.
- B. The bucket used for the lift shall have the proper lift point attachments.
- C. The ground person performing the rigging must be a qualified rigger.
- D. All rigging and hardware must meet the requirements found in ES-MECH-007, Hoisting and Rigging.
- E. The chains must be attached to the bucket per the manufacturer's manual instruction.
- F. Both the backhoe/loader and the ground man must have had hand signal training.
- G. The object to be lifted must be within the capacity of the backhoe/loader.
- H. The lift shall NEVER be moved over a person's head, persons should not be allowed near the lift. Know the locations of all persons in the work area.
- I. The use of a hand line will assist in keeping the ground person clear of the lift.
- J. If using the backhoe for the lift, position the stabilizers to keep the machine level.
- K. Avoid lifts on soft ground, use pads under stabilizers to spread weight if necessary.
- L. Boom lock must be unlocked and swing lock pin removed to avoid machine damage when using the backhoe.
- M. Before starting job test the load:
 - i. Park machine close to load.
 - ii. Engage park brake.
 - iii. Raise the load off of the ground slightly.
 - iv. If using the backhoe, swing the load all the way to one side.
 - v. While keeping load close to ground, move it away from machine.
 - vi. If machine or stability is reduced, lower the load to the ground.

5.0 TRAINING

5.1 TRAINING SCOPE AND COVERAGE

- A. Backhoe/loader training and qualification shall be subcontracted to a qualified training institution.
- B. Training shall meet all OSHA, ANSI and other regulatory requirements.
- C. Human Resources shall document that each operator has been trained and evaluated by a certified training group. The qualification documentation shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the training entity performing the training and qualification.

5.2 TRAINING AND QUALIFICATION

	Backhoe/loader Operator
Prerequisite	Valid Driver's License
Subcontracted Qualification Training	Yes
3 Year Requalification	Yes

Supervisors are responsible for assuring that Backhoe/loader Operators maintain proficiency in the operation of the Backhoe/loader. Failure to maintain this proficiency will require the Operator to retake training.

5.3 ATTACHMENTS

All personnel using backhoe attachments and related components shall be trained and qualified to understand the requirements of the specific equipment operation, safety concerns and daily inspection and shall be qualified backhoe/loader operators.

To become attachment qualified, the operator must have read the operator's manual and have a training session with a designated instructor showing proper care of usage and safety requirements during hands on training session with the equipment. The operator must also have PPE training to properly identify and use the PPE required for use of the equipment.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 12 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

5.4 TRAINING PROCEDURES

A. INITIAL TRAINING AND QUALIFICATION RESPONSIBILITIES

This section details the training and qualification requirements for Backhoe/loader Machine Operators. Qualified personnel or trainees shall be at least 18 years old, be able to read and understand the posted warning labels on the backhoe and be able to understand the Instructor.

Responsibility	Action
Candidate's Supervisor or Manager	1. Determine the individuals required to operate the backhoe/loader and requests training and qualification of personnel by contacting Human Resources.
Human Resources	2. Schedule training and makes all necessary logistical arrangements for the training, verifies that candidate has a valid driver's license. 3. Notify the candidate(s) of scheduled training and arranges for practical training, as necessary.
Candidate	4. Attend the scheduled training course. 5. Provide operator's resume/experience summary, as required, for the qualification sought.
Qualified Instructor	6. Provide the appropriate training and testing. The candidate is evaluated on the Backhoe/loader machine to be used and the instructor documents the training. Sign evaluation and submit qualified operator information to Human Resources.
Human Resources	7. Prepare and maintain a qualification package for each successful candidate. 8. Prepare a PPPL Qualification Card with the appropriate qualification and expiration date entered on the qualification card PPPL qualifications are valid for a period not to exceed three (3) years from the date of the practical or written test, whichever date is earliest. 9. Sign the PPPL Qualification Card for Special Purpose Equipment Operators.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 13 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

- | | |
|-----------------|---|
| Human Resources | <p>10. Copy the completed card (both sides) for file, and distributes the card to the individual.</p> <p>11. Maintain training and qualification records.</p> <p>12. Monitor due dates and notifies the individual's manager or supervisor of actions needed to maintain or renew qualifications.</p> |
|-----------------|---|

B. CONTINUING TRAINING AND QUALIFICATION RESPONSIBILITIES

This section outlines the continuing (ongoing) training and qualification requirements for Backhoe/loader Qualifications.

Responsibility	Action
Human Resources	<p>1. Notify the individual's supervisor or manager of continuing training and qualification requirements that require completion.</p> <p>NOTE: Initial qualifications are issued for an effective period not to exceed three (3) years, unless otherwise specified or revoked, at which time requalification is required. If it is determined at any time that the capabilities of an individual are not in accordance with the qualifications specified for that job, that individual shall be removed from that job. Such removals shall be handled on a case-by-case basis by the PPPL Lift Manager and the applicable supervisor.</p>
Individual's Supervisor and Manager	2. Notify the individual of these continuing training and qualification requirements.
Human Resources	<p>3. Arrange for refresher training and required tests for applicable qualifications.</p> <p>4. Schedule practical training and make all necessary logistical arrangements for Backhoe/loader Operator qualifications.</p> <p>5. Notify the individual of scheduled practical training.</p>
Individual/Candidate	6. Complete refresher training.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 14 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

- | | |
|----------------------|---|
| Qualified Instructor | 7. Provide the practical training and testing for Backhoe/loader Operator qualifications and documents training and qualification and sends to Human Resources. |
| Human Resources | 8. Prepare a PPPL Special Purpose Equipment User Qualification Card with the appropriate qualifications and expiration date entered on the card. PPPL qualifications are valid for a period not to exceed three (3) years from the date of the practical or written test, whichever date is earliest. |
| | 9. Sign the PPPL Qualification Card for Backhoe/loader Operators. |
| Human Resources | 10. Copy the completed card (both sides) for file, and distribute the card to the individual. |
| | 11. Maintain training and qualification records. |
| | 12. Monitor due dates and notify the individual's manager or supervisor of actions needed to maintain or renew qualifications. |

6.0 INSPECTIONS

A. DAILY INSPECTIONS

A complete listing of Operator's Daily Check Lists for all equipment may be found at the follow site:

<https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/>

The Operator's Daily Check List (ODCL) will be maintained by Material Services. Before use each day or at the beginning of each shift, the backhoe/loader shall be given an Operator's Daily Check List inspection consisting of visual inspection and functional tests including but not limited to the following:

- i. Safety systems including interlocks, ROPS and guards.
- ii. Current Monthly Inspection, the inspection is not current (date of last inspection within the last 30 days), the operator shall tag out the backhoe in accordance with PPPL Procedure ESH-001 until the inspection is current.
- iii. Electrical Systems for worn or frayed wires and loose connections.
- iv. Fuel level.
- v. Hydraulic oil level and hoses.
- vi. Remove dirt and debris from radiator.
- vii. Function of controls and brakes.
- viii. Tires and tire air pressure.
- ix. Loose or missing parts.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 15 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

- x. Any manufacturer specified parts.
- xi. Lubricate specified points as described in operator's manual including but not limited to:
 - a) Loader pivots
 - b) Steering pivots
 - c) All backhoe pivots
 - d) Stabilizers
 - e) Bearing strips
 - f) Axel and driveshaft U-joints
- xii. The ODCL shall be maintained in holders installed on the backhoe and given to the supervisor at the end of the week.
- xiii. The supervisor will keep the ODCL for 3 years.
- xiv. ODCL's will be maintained by Material Services, changes may be authorized by the Subject Matter Expert see Attachment 1. The inspections required due to changed frequency approved by the SME, will be noted on the ODCL signature Sheet as an inspection of that frequency (monthly).
- xv. The daily ODCL shall be maintained in holders installed on the backhoe/loader. The ODCL inspector will sign the Signature Sheet at the completion of the inspection if there are no concerns. The Signature Sheet will be given to the backhoe's Contact's Supervisor when full. The Supervisor will send the Sheet to the Operations Center for record keeping.

If during the inspection of the backhoe/loader it is found to be in need of repair or becomes unsafe in any way, it shall be reported to the operator's supervisor immediately and the backhoe/loader shall be tagged out, in accordance with PPPL Procedure ESH-001, and not be operated until repaired and restored to a safe operating condition. The Operator's Supervisor will contact the PTR for service.

B. MONTHLY INSPECTIONS

The monthly inspection is defined as the Operational Checkout section (95) of the Operator's manual. This Checkout must be current (within the last 30 days) prior to the backhoe/loader being used. If any part of the inspection fails, the backhoe/loader shall be tagged out in accordance with PPPL Procedure ESH-001 until such time as the repairs have been made and the machine passes a new inspection.

C. FREQUENT AND ANNUAL INSPECTIONS

Frequent and Annual inspections shall be made based on the manufacturer's requirements specified in the manual provided by the manufacturer. These inspections must be conducted by a Qualified Subcontractor. All inspection reports shall be given to the Fleet Coordinator for filing.

7.0 MAINTENANCE AND REPAIR

Note: No modifications or additions which affect the capacity or safe operation of the backhoe shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly [29 CFR 1926.602(c)(ii)].

A. REQUIREMENTS

- i. Maintenance shall be performed according to the manufacturer's recommendations at daily (10 hours), 250, 500 and 1000 hr levels and as a minimum shall meet the requirements of OSHA, 29 CFR 1910, 29 CFR 1926, ESH-001 (Tagout).
 - a. Power plant shall be stopped and starting means rendered inoperative.
 - b. All controls in the off position and all operating systems secured from inadvertent motion by brakes, blocks or other means.
 - c. Elevating boom lowered to the full down position or otherwise secured by supports to prevent dropping.
 - d. Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
 - e. Prior to the commencement of any service or repair, the backhoe shall be turned off with the key removed and in the possession of the repairman. Any potential energy (such as raised arms) shall be blocked or restrained. (Per OSHA response regarding 1910.147 - 9/27/95) Any sources of hydraulic pressure shall be removed or released. If the service or repair requires work in the engine compartment, then the backhoe battery cable shall be disconnected (Cable shall be tagged with a Danger Tag if service person must be away from unit.
 - f. Other manufacturer specified precautions.
- ii. A scheduled planned maintenance, lubrication and inspection system shall be followed based on the manufacturer's recommendations.
- iii. Only qualified, trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect backhoe/loaders.
- iv. Unusual maintenance or repairs require consultation with the manufacturer.
- v. All parts requiring replacement shall be replaced only by OEM parts equivalent as to the safety of those used in the original design.
- vi. Backhoe/loaders shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts.
- vii. Repaired backhoe/loaders shall be inspected prior to being returned to service by qualified inspectors or sub contractors. The service report will be completed and

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 17 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

- signed by the inspector and the PTR, or the technically qualified designee, while on site and given to the PTR.
- viii. The PTR will sign the report and give it to the Fleet Coordinator, copy to PTR, and be filed in the backhoe's file.
 - ix. Safety switches and functionality shall not be impaired by service technicians unless required for the repair operation. Such impaired backhoes shall be tagged as out of service until the safety impairment is removed.
 - x. If adjustments must be made with the engine running, always work as a 2 man team with a Qualified Operator sitting in the operator's seat.
 - xi. Adjust tire pressure from a distance and from behind tire tread.

B. PROCEDURE FOR OBTAINING MAINTENANCE AND REPAIR FOR A BACKHOE/LOADER

Responsibility Action

- | | |
|---------------------|--|
| Equipment Custodian | 1. Know where backhoe is at all times and provide backhoe for inspection. |
| Fleet Coordinator | 2. Maintain the inspection records for periodic inspection/maintenance. |
| Lift Manager | 3. Maintain due date to inspect backhoe annually on Inspection Status List. If the maintenance or inspection is not completed the backhoe shall be CAUTION tagged OUT OF SERVICE until such time as the required actions are completed, per PPPL Procedure ESH-001. |
| Lift Manager | 4. Determine if backhoe is to be kept in service. <ul style="list-style-type: none"> a. If backhoe is not to be kept in service, Equipment Custodian to CAUTION tag item OUT OF SERVICE as per PPPL Procedure ESH-001. |
| Fleet Coordinator | 5. A scheduled planned maintenance, lubrication, and inspection system shall be followed using the manufacturer's recommendations. At a minimum, an annual inspection shall be performed using the form found for each piece of equipment listed at:
https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/ .

More frequent inspections may be required based on the equipment's usage and hour meter as determined by the equipment contact and SME. |
| | 6. Arrange for a qualified backhoe inspector or a qualified subcontractor to perform the inspection/maintenance. (Annual PM or repair service) and obtains name of service repairman. |

MCR-ES-MECH-011,R2-003

12. Verifies that repairman is using our annual maintenance schedule.

17. Perform a final inspection with the ODCL, sign Signature Sheet.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 19 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

- | | |
|-------------------|---|
| PTR or Designee | <p>18. Upon completion of work determine if deficiencies are found.</p> <ul style="list-style-type: none"> a. If no, sign and submit service report to Fleet Coordinator, copy to the PTR, and affix inspection sticker, showing expiration date to the backhoe, and to the attachment if so equipped. b. If yes, sign and submit service report to Fleet Coordinator, copy to PTR, and apply CAUTION tag OUT OF SERVICE per PPPL Procedure ESH-001. <p>19. Upon completion of work verifies that repairman performs final ODCL and safety check and assures proper operation of all safety or warning devices.</p> <p>20. Checks repair documentation and signs service forms.</p> <p>21. Upon completion of work directs repairman back to fleet coordinator.</p> |
| Fleet Coordinator | <p>22. Upon receipt of invoice compares invoice to service report and contract to assure it is correct and recommends/approves invoice.</p> <p>23. Review and file all service reports and update inspection status list.
Note: Maintenance/Inspection Reports are maintained for the life of the backhoe.</p> <p>24. Return to step 2 for each backhoe.</p> |
| Equipment Contact | <p>25. Schedule a monthly backhoe inspection and record inspection on ODCL form, ODCL forms are filed with the Operations Center.
Note: Monthly ODCL's will be maintained for the life of the vehicle.</p> |

8.0 MODIFICATIONS/ATTACHMENTS

- A. Backhoe/loaders shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts.
- B. No modifications or additions which affect the capacity or safe operation of the backhoe will be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly [29 CFR 1926.602(c)(ii)]

Note: Alterations to backhoe may be made without manufacturer's approval if the manufacturer no longer exists, or if the manufacturer is unresponsive for more than a year, with the Subject Matter Expert's approval of the change and the concurrence of a Professional Engineer (Attachment 1). (OSHA response 4/11/97, Question 1)

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 20 of 20
Chapter 3 Backhoe/Loader		

MCR-ES-MECH-011,R2-003

If modifications may degrade or have deleterious effects on safety features safe operations, then Engineering approval is needed. Added safety features such as back-up beepers would not need Engineering approval.

- C. Operating Manuals for all approved attachments shall be kept with the backhoe at all times.
- D. PPPL Qualification per attachment is required to operate any attachment.
- E. Backhoe must be shutdown and deenergized prior to attaching or removing attachments:
 - i. Park machine safely.
 - ii. Remove key.
 - iii. Block lift arms if not in full down position.
 - iv. Chock wheels in both directions.
 - v. Do not have others start procedure until machine is de-energized.
 - vi. "Hot Tapping" is NOT allowed.
 - vii. Follow manufacturers' instruction for installing/removing attachment.
- F. Attaching hydraulic lines between attachments and backhoe/loader:
 - i. Install quick-disconnect couplers on attachment hoses to quick-disconnect couplers on backhoe/loader.
 - ii. Enter backhoe/loader, fasten seat belt, and start engine.
 - iii. Slowly cycle the auxiliary control handle several times to purge system of air and check for proper hydraulic connection.

Note: Use a piece of cardboard to check for leaks, hydraulic fluid under pressure can enter the skin causing serious injury requiring immediate medical attention.

- iv. With the attachment in a static position, check the hydraulic oil level of the backhoe/loader. Fill to operating level as necessary.

WARNING: Serious injury or death is possible if safe practices are not followed when installing or removing attachments.

9.0 RECORDS

- A. Inspection reports shall be maintained by Material Services.
- B. Non-destructive examination reports shall be prepared by the contractor and retained by Material Services.
- C. Records shall be retained in the Material Services Transportation Services master files for the life of the backhoe while at PPPL.

ATTACHMENTS:

1. ODCL Change Request Form and Equipment Alteration Request Form
2. Service Report

Request to move inspection item from Daily to Monthly

Equipment Type _____

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Item to be moved	Reason for move	Frequency of Inspection item is moved to

Requested By: _____ Date _____

Approved by: _____ Date _____

Subject Matter Expert

Comments _____

Distribution: _____, _____, _____

Approved form to be filed by Material Services with the ODCL Masters

Revised 2/12/13

**Chapter 3 Backhoe/Loader - Equipment Change Request
Form**

Page 2 of 2

MCR-ES-MECH-011,R2-003

Request to Alter Equipment with Engineering Decision

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Provide detail of changes/modifications requested and reasons:

Requested by: _____ Date _____

Approved by: _____ Date _____
Subject Matter Expert

Approved by: _____ Date _____
Professional Engineer

Comments _____

Distribution: _____, _____, _____

Approved form to be filed by Material Services in equipment file

Revised 2/12/13

Chapter 3 Backhoe/Loader - Service Report

MCR-ES-MECH-011,R2-003

PPPL Equipment Service Report

To be completed by PPPL	Equipment Type _____ Date _____
	Manufacturer _____ Model _____
	Serial Number _____
	Property Number _____
To be completed by Service Technician	Equipment Problem/Service Requested: _____ Requestor: _____ - _____ _____ _____
	Work/Service Performed and comments: _____ _____ _____ _____ _____ _____ _____

When service work has been completed:

1. Perform Operator's Daily Checklist Inspection
2. Every Inspection – Check that all safety devices, interlocks, lights and alarms are functioning properly
3. All product recalls and safety improvements have been installed.

Sat	Unsat
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

NOTE: Any and all malfunctioning safety devices, interlocks, lights and alarms must be brought to the immediate attention of the PPPL escort regardless of the nature of the service call.

Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL)
INSPECTOR (PRINT): _____ SIGNATURE: _____ DATE: _____
Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL – TAGGED OUT, PTR NOTIFIED)
Escort (PRINT): _____ SIGNATURE: _____ DATE: _____

This form must be completed at end of service call, give to Fleet Coordinator, copy to PTR

MCR-ES-MECH-011,R2-003

Additional writing space on reverse

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2
Chapter 4 Construction/Demolition Equipment		Page 1 of 7

MCR-ES-MECH-011,R2-003

Table of Contents

1.0	SCOPE/APPLICABILITY OF THIS CHAPTER	2
2.0	INTRODUCTION	2
3.0	TRAINING	2
4.0	OPERATIONS	3
5.0	INSPECTIONS.....	4
6.0	IDENTIFICATION.....	5
7.0	MODIFICATIONS TO EQUIPMENT AND ATTACHMENTS.....	5
8.0	CONSTRUCTION/DEMOLITION EQUIPMENT PURCHASED SERVICES REQUIREMENTS	5

Chapter 4 Construction/Demolition Equipment**MCR-ES-MECH-011,R2-003****1.0 SCOPE/APPLICABILITY OF THIS CHAPTER**

The types of equipment this chapter refers to are dozers, excavators, wheel loaders and track type loaders, often referred to as earth-moving machinery.

PPPL does not own any of this type of equipment and work to be performed that requires this kind of equipment will be subcontracted. This chapter is meant to provide information and guidelines for Cognizant Individuals to assist in the preparation of a Statement of Work (SOW) for the proposed work.

2.0 INTRODUCTION

The use of Construction/Demolition Equipment is a hazardous operation having potential consequences ranging from minor injuries and minor property damage, to fatalities and major property losses if not performed in a safe manner. Reduction of these hazards to risk levels that are acceptable requires the proper design, maintenance, and use of mechanical devices; care and common sense; proper training and supervision; and the careful adherence to approved work and safety procedures.

3.0 TRAINING

Only trained, qualified operators may operate Construction/Demolition Equipment at PPPL. Subcontractors wishing to operate Construction/Demolition Equipment must provide proof to the Head, Facilities and Site Services of every operator's training and certification to operate the equipment they intend to use. Qualified personnel shall be at least 18 years old and be able to read and understand the posted warning labels on the equipment.

3.1 Training Requirements

Prior to any operation of any construction/demolition equipment on the PPPL campus, the operator's proof of training must be provided to the Head, Facilities and Site Services. The proof may be provided using the form found in Chapter 7, Section 8.3 of this Engineering Standard.

The training program for construction/demolition equipment shall have as a minimum;

- A. The operator shall have read the operator's manual for the equipment to be operated.
- B. The operator shall have been instructed on how to perform an Operator's Daily Check List inspection.
- C. Operator's responsibilities with problems and/or malfunctions with construction/demolition equipment have been defined.
- D. Stability issues.
- E. Locations and meanings of warning and informational labels and decals.
- F. How to perform a work site inspection.
- G. Safety rules for the equipment and operation.
- H. Experience in the safe operation of the equipment.
- I. Operators shall be trained in the use of any attachments to the equipment that are to be used.

Training certifications must be recertified at least every 3 years.

Chapter 4 Construction/Demolition Equipment**MCR-ES-MECH-011,R2-003****4.0 OPERATIONS****4.1 General Safety Requirements**

All safety requirements must be followed at all times in order to avoid the chance of serious injury or death.

- A. An ODCL inspection shall be performed on the equipment before every shift, the ODCL form shall be kept on the equipment. The inspection shall be based on the equipment manufacturer's requirements.
- B. If at any time the equipment is found to be in need of repair, defective, or in any way unsafe, the unit shall be tagged out of service until restored to a safe operating condition per PPPL Procedure ESH-001.
- C. No equipment shall be operated with a leak in the fuel or hydraulic systems.
- D. Enter/exit equipment only at proper locations where steps and/or handholds are provided using 3 points of contact at all times, use seat belt while in cab (if provided).
- E. The operator must be in the operator's seat when starting the engine and must remain in the seat while the equipment is in operation.
- F. Equipment owners shall keep and maintain a copy of the operating and maintenance manual(s) on the equipment at all times. The manual(s) is(are) considered an integral part of the equipment and is(are) vital to communicate necessary safety information to operators.
- G. Before the equipment is used and during use, the user shall check the area in which equipment is to be used for possible hazards such as, but not limited to:
 - i. Drop-offs or holes, including those concealed by water, ice, mud, etc.
 - ii. Slope(s).
 - iii. Debris.
 - iv. Overhead obstructions and high voltage conductors.
 - v. Inadequate surface and support to withstand all load forces imposed by equipment in all operating configurations.
 - vi. Wind and weather conditions.
 - vii. Presence of unauthorized persons.
 - viii. Pedestrian and vehicle traffic flow.
 - ix. Other possibly unsafe conditions.
- I. Whenever a potential energy source is known to exist within the operating arc, reach or travel of the equipment, a dedicated ground crew safety watch/spotter shall be present and observing the operation at all times.
- J. Riders are not permitted on any construction/demolition equipment at any time.
- K. Appropriate Personal Protective Equipment shall be worn at all times.
- L. All personnel within work site must wear safety vests and understand hand signals, only one person uses hand signals to direct equipment operation.
- M. At end of operation, park, set parking brake, lower hydraulics, shut engine off, remove key.

Chapter 4 Construction/Demolition Equipment**MCR-ES-MECH-011,R2-003**

- N. Refueling of equipment shall be performed following the requirements as listed in Section 8.4 of Chapter 7 of this Engineering Standard.

4.2 Excavation/Trenching Specific Operational Requirements

- A. Call 811 at least 1 week prior to digging.
- B. A valid PPPL digging permit is required for all excavations.
- C. If digging near an underground utility, the excavator may only remove material to the pavement depth until the location of the utility is verified.
- D. Mechanical digging may not occur within 2 feet of the marked width of the utility.
- E. Hand dig to verify location of utility initially and when crossing a utility.
- F. After verifying the utility location, no powered excavating may come within 2 feet of the utility in any direction.
- G. Before the equipment is used and during use, the user shall check the area in which equipment is to be used for possible hazards such as, but not limited to:
 - i. For excavations, note markings for underground utilities.
 - ii. Determination of soil type and conditions.
 - iii. If digging near underground utilities, ensure bucket teeth are barred.
- H. Ensure swing radius is clear of all objects and personnel at all times.
- I. If anticipated groundwater is encountered, execute control plan in Digging Permit. If unanticipated groundwater is encountered, halt excavation and contact ESD.

5.0 INSPECTIONS**A. Frequent Inspections and Test**

The operator shall provide proof of the daily inspections based on the equipment manufacturer's requirements with a minimum of:

- i. Visual walk around inspection including ROPS and guards
- ii. Proper operation of all controls
- iii. Visual and audible check of safety items
- iv. Missing or illegible warning labels and decals
- v. Visual check of fuel, hydraulic and/or pneumatic systems for deterioration and leaks
- vi. Check of electrical systems for malfunctions and/or wear
- vii. Functional testing of all components and emergency controls
- viii. Manufacturer's required daily lubrication make be done at this time
- ix. Attachments to the equipment shall be included in any inspections

B. Periodic Inspection and Test

The operator shall provide proof of periodic inspections and tests as required by the equipment manufacturer with a minimum of:

Chapter 4 Construction/Demolition Equipment**MCR-ES-MECH-011,R2-003**

- i. Structural members for deformation, cracks or corrosion.
- ii. Parts, such as pins, bearings, shafts, gears, rollers, locking devices, chains, chain sprockets, wire and synthetic ropes, and sheaves for wear, cracks or distortion.
- iii. Hydraulic and pneumatic relief valve settings.
- iv. Hydraulic system for proper oil level.
- v. Hydraulic and pneumatic fittings, hoses, and tubing for evidence of leakage, abnormal deformation or excessive abrasion.
- vi. Compressors, pumps, motors, and generators for loose fasteners, leaks, unusual noises or vibrations, loss of operating speed and/or excessive heating.
- vii. Hydraulic and pneumatic valves for malfunction and visible cracks in the external valve housing, leaks, and/or sticking spools.
- viii. Visually inspect any vacuum prevention systems and verify function of such systems.
- ix. Hydraulic and pneumatic cylinders and holding valves for malfunction and/or visible damage.
- x. Hydraulic and pneumatic filters for cleanliness or the presence of foreign material in the system indicating other component deterioration.
- xi. Electrical systems and components for deterioration or wear including those not readily visible on a frequent inspection.
- xii. Performance test of all boom, arm or stick movements.
- xiii. Condition and tightness of bolts and other fasteners in accordance with any manufacturer's recommendations.
- xiv. Welds, as specified by the manufacturer.
- xv. Legible and proper identification, operational, and instructional markings.

6.0 IDENTIFICATION

Every piece of construction/demolition equipment shall have attached to it a legibly inscribed, corrosion-resistant nameplate with the model and/or serial number and any approved attachment to be used onsite at PPPL.

7.0 MODIFICATIONS TO EQUIPMENT AND ATTACHMENTS

No modifications or alterations to the construction/demolition equipment shall be made without the approval and certification of the manufacturer in writing. Any modifications made must be represented on the manufacturer supplied name plate.

All attachments to the equipment shall be approved by the manufacturer for use with the equipment.

8.0 CONSTRUCTION/DEMOLITION EQUIPMENT PURCHASED SERVICES REQUIREMENTS

The requirements of this chapter must be a part of the Statement of Work or Specifications being written that include this type of work and must approved by the Head, Facilities and Site Services.

Chapter 4 Construction/Demolition Equipment**MCR-ES-MECH-011,R2-003**

PPPL requires conformance with all applicable OSHA, ANSI and ASME Standards regarding construction/demolition equipment applications. Procurement shall ensure the following requirements are passed down to all sub-tiered contractors and the PPPL Procurement Technical Representative shall ensure that the Head, Facilities and Site Services is notified in a timely fashion to verify compliance with all requirements. Additional information and a checklist are provided in Chapter 7, Section 8.1, Section 8.3 and Section 8.4 of this Engineering Standard. Please note that failure to abide by the suggested advance notice requirements may result in disallowance of the construction/demolition equipment onsite. These requirements shall include but are not limited to adherence to:

§ OSHA 1926 Subpart O Motor Vehicles, Mechanized Equipment and Marine Operations
(Including the PCSA Standards referenced within)

§ OSHA 1926 Subpart P Excavations

§ OSHA 1926 Subpart W Rollover Protective Structures

ISO 20474-1:2008 Earth-moving machinery - Safety - Part 1: General requirements

ISO 20474-2:2008 Earth-moving machinery - Safety - Part 2: Requirements for tractor-dozers

ISO 20474-3:2008 Earth-moving machinery - Safety - Part 3: Requirements for loaders

ISO 20474-5:2008 Earth-moving machinery - Safety - Part 5: Requirements for hydraulic excavators

PPPL ES&H Directive 5008, Section 1.0, Construction Safety

ES-MECH-013 Excavation Soil Erosion and Sediment Control

In addition to these standards, PPPL requires the following:

- A. Procedural Steps - Prior to award, the proposing construction/demolition equipment subcontractor shall provide details of all work procedures and proposed equipment to be used.
- B. PPPL requires integration of PPPL requirements per PPPL Policy P-072 for all subcontracted work.
- C. Subcontractors shall provide an onsite Competent Person for all excavations, demolitions and construction; in addition, the subcontractor will provide a Professional Engineer for any OSHA based requirements for work required within the subcontract.
- D. Subcontractors shall work with PPPL Engineers to develop the required PPPL dig permit (as required per ENG-024) and shall follow requirements listed in ES-MECH-013 Excavation Soil Erosion and Sediment Control for all excavations.
- E. Construction/demolition equipment Operator Qualifications - Prior to any work, the subcontractor shall provide the designated operators qualifications including:
 - i. Training Certification.
 - ii. Short narrative of recent and frequent experience with proposed equipment.
- F. Fueling and maintenance procedures shall comply with the stated requirements of this chapter and chapter 7.
- G. Current Inspection Reports for all construction/demolition equipment to be used on site.
- H. Every construction/demolition equipment unit will have an ODCL performed on it daily.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	No. ES-MECH-011 Rev. 2 Page 7 of 7
Chapter 4 Construction/Demolition Equipment		

MCR-ES-MECH-011,R2-003

- I. Every construction/demolition equipment operator shall understand PPPL tagout procedures and shall tagout any equipment that fails an ODCL. Some equipment may require the use of OSHA approved blockout as well.

- J. If the construction/demolition equipment is to be used for lifting material (i.e. pipes), the equipment shall have proper lifting points for use with rigging and all applicable lifting requirements as found in ES-MECH-007, Hoisting and Rigging, shall be followed. (Standard 29 CFR 1910.179(n)(3)(vi) states that “The employer shall require that the operator avoid carrying loads over people.” OSHA Standard 29 CFR 1926.550(a)(19) “All employees shall be kept clear of loads about to be lifted and of suspended loads.”)

- K. All rigging and hardware must meet the requirements found in ES-MECH-007, Hoisting and Rigging.

Table of Contents

1.0 INTRODUCTION.....	2
2.0 DEFINITIONS	2
3.0 OPERATIONS	4
4.0 TRAINING	5
5.0 INSPECTIONS.....	6
6.0 MAINTENANCE AND REPAIR	7

Chapter 5 Vehicle Attachments and Portable Equipment

MCR-ES-MECH-011,R2-003

1.0 INTRODUCTION

The use of vehicle or equipment attachments or the use of portable equipment may be a hazardous operation if not performed in a safe manner. Reduction of the hazards to risk levels that are acceptable requires the proper design, maintenance, and use of mechanical devices; care and common sense; proper training and supervision; and the careful adherence to approved work and safety procedures.

Attachments for forklifts are covered in the Engineering Standard ES-MECH-010 specific to that type of equipment. Attachments for skid steers and backhoe/loaders are covered in the chapters of this Engineering Standard specific to that equipment (Chapters 2 and 3).

Vehicle Attachments are defined as:

Polaris Snow Plow
Meyers Truck Plow
Thieman Gate Lift
Spreaders

Protech Sno Pusher
Maxon Gate Lift
Tommy Gate Lift
Kelly Loading Dock (Building attachment)

Portable Equipment is defined as equipment such as:

Hotsy Pressure Washer
Clark Floor Scrubber
Sullair Air Compressor
Miller Arc Welder
Clipper Concrete Saw
John Deere Sprayer
Stihl Chain Saw
Red Max Blower

EDCO Compact Planer
Honda Snow Blower
Tennant Sweeper
Ariens Power Brush
Echo Power Blower
Little Wonder Blower
Weed Whacker

2.0 DEFINITIONS

Attachment – Tool that is usually mounted to a vehicle or other equipment to perform a special function that may be different than the normal usage for the base equipment.

Authorized Person – Personnel approved or assigned to perform a specific type of duty or duties at a specific location or locations at a work site.

Capacity – The capacity of a piece of equipment is the rated safe load the equipment can handle without causing injury or failing. This capacity is usually found on the manufacturer's name plate on the unit.

Dockboard (Bridge Plates) – Portable or fixed devices for spanning the gap or compensating for the difference in level between loading platforms and carriers.

Equipment Contact Individual having physical possession of government personal property items (capital, controlled, other accountable, sensitive, high risk and administratively controlled) charged to their care. Usually reports organizationally or functionally to the custodian

Equipment Custodian – Individual designated by Division/Department Head or Project

Chapter 5 Vehicle Attachments and Portable Equipment**MCR-ES-MECH-011,R2-003**

Administrator for a particular functional or organizational area of responsibility (usually at section head level or higher). This individual maintains liaison with Material Services Property Management personnel regarding inventories, equipment spot-checks, property loans, intra-lab permanent transfer of property, disposal and other actions/problems regarding equipment within their assigned functional area.

Fleet Coordinator – The Fleet Coordinator is the person in the Material Control Group assigned to maintain DOE required documentation regarding the status of all government owned vehicles at PPPL.

Hot Tapping – A disallowed unsafe practice of installing or removing an attachment to a piece of equipment while the equipment is running and/or while the hydraulic or electrical systems required are energized.

Interlock – A control or mechanism that, under specified conditions, automatically allows or prevents the operation of another control or mechanism.

Modification – To make a change to equipment that affects the operation, stability, safety factors, rated load or safety of the equipment or attachment in any way.

OEM – Original Equipment Manufacturer.

Operation – Performance of functions of equipment within the scope of its specifications and in accordance with the manufacturer's instructions, the PPPL's work rules and applicable government regulations.

Operator – A qualified person who controls the movement and use of equipment.

Operator's Daily Check List (ODCL) – The checklist to be used by the operator to inspect the equipment at the start of every shift and used to log safety and operating issues that arise during the shift. The ODCL will be kept on the machine until shift end and then be given to the Supervisor for filing.

Operator's Manual – The manual(s) supplied by the manufacturer with operation, inspection, maintenance, repair requirements, and may also include specifications and other information. The manual may only be updated and/or replaced by the Equipment Custodian who will be responsible for the proper distribution of the new manual.

Powered Functions – Those functions which control motion of the equipment or attachment and are caused by electro-mechanical, hydraulic or pneumatic forces.

Power Plant – Is defined as the power source for a piece of equipment.

Portable Equipment – Powered Equipment that is self propelled or not, that is meant to be used to perform a specific function as a standalone unit. Generally equipment that is meant to be moved in the course of operation.

Chapter 5 Vehicle Attachments and Portable Equipment**MCR-ES-MECH-011,R2-003**

Princeton Technical Representative – Individuals designated as PTRs must have successfully completed the following training courses: a. General Employee Training; b. Subcontract Administration for Princeton Technical Representatives; c. Hazard Awareness (JHA training).

Qualified Instructor – An individual with experience, training, or education in Systematic Approach to Training (SAT) Methods and presentation techniques. These individuals are capable of developing training courses and materials, approving training courses and materials developed by other instructors, presenting classroom and On-the-Job instruction, evaluating trainees, and evaluating training programs.

Qualified Person – An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated an ability to recognize, evaluate and resolve concerns regarding the specific subject matter.

Qualified Subcontractor - One whose qualifications have either been evaluated and accepted by the Procurement Technical Representative or the instant Equipment Custodian or whose parent company qualification program has been evaluated and accepted by the PTR and the individual carries documentation (e.g. card) which shows completion of approved training.

Safety Interlock – A switch used to shut down, lock out and prevent the accidental use of equipment. The interlock by itself does not always control all hazardous energy of the equipment.

Shall – The word shall is to be understood as being mandatory.

Subject Matter Expert – An individual with prerequisite background or experience necessary for instructional competency in a specific subject, task, or field of knowledge. Such an individual is qualified by education, training, or experience, and is a recognized expert on a particular subject, task, or system. These individuals are capable of developing training courses and materials, presenting classroom and On-the-Job instruction, and evaluating trainees, within their subject area. The SME for portable equipment is the Lift Manager.

3.0 OPERATIONS

A. REQUIREMENTS

- i. Only trained operators carrying a current PPPL Qualification card shall operate equipment.
- ii. Prior to the operation of any equipment, the operator shall have read the operator's manual for the particular equipment or attachments being operated.
- iii. If at any time equipment is found to be in need of repair, defective, or in any way unsafe, the equipment shall be tagged out of service until restored to a safe operating condition as per PPPL Procedure ESH-001.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 5 of 10
Chapter 5 Vehicle Attachments and Portable Equipment		

MCR-ES-MECH-011,R2-003

- iv. Fuel tanks shall not be filled with the engine running, refueling must follow the procedure defined in ES-MECH-014, Refueling and Recharging Vehicles and Equipment.
- v. No equipment shall be operated with a leak in the fuel system.
- vi. Operator shall use proper PPE for equipment being operated.
- vii. Equipment custodian shall keep and maintain a copy(ies) of the operating and maintenance manual(s) for Attachments and Portable Equipment in weather resistant storage in an accessible location. The manual(s) is (are) considered an integral part of the equipment and is vital to communicate necessary safety information to users and operators.
- viii. Always look back when you're operating the equipment in reverse. Make sure no one is in the way.
- ix. The operator shall follow the manufacturer's directions for refilling material consumed by the equipment (i.e. sand, cleaner chain oil, etc.)
- x. Only qualified persons may install or remove attachments, these persons shall follow all manufacturer's directions when installing or removing attachments.

4.0 TRAINING

A. TRAINING PROCEDURE

Users of Attachments and Portable Equipment need to have Safety Training prior to use of equipment.

<u>Responsibility</u>	<u>Action</u>
Special Equipment User	<ol style="list-style-type: none"> 1. Contacts Supervisor to obtain Safety Training for specific equipment. 2. Fills out Special Equipment User Summary of Safety Training form (Attachment 1) indicating what equipment training is necessary. 3. Takes the required training, if any, and reads Operator's Manual for the equipment desired. Documents results on form.
Shop Supervisor	<ol style="list-style-type: none"> 4. Assigns Instructor to provide Safety Training on designated equipment.
Instructor	<ol style="list-style-type: none"> 5. Fills out Attachment 1 indicating what Safety Training was provided. 6. Gives Attachment 1 to Shop Supervisor for review.
Shop Supervisor	<ol style="list-style-type: none"> 7. Reviews Attachment 1, signs and sends to Human Resources for review and approval.
Human Resources	<ol style="list-style-type: none"> 8. Approve, sign and file the form.

Chapter 5 Vehicle Attachments and Portable Equipment**MCR-ES-MECH-011,R2-003****B. REQUIREMENTS**

All personnel using portable equipment or vehicle attachments and related components shall be trained and qualified to understand the requirements of the specific equipment operation, safety concerns and daily inspection.

To become qualified, the operator must have read the operator's manual, read PPPL Procedure ESH-001 and have a training session with a designated instructor showing proper care of usage and safety requirements during hands on training session with the equipment. The operator must also have PPE training to properly identify and use the PPE required for use of the equipment.

Operators of seasonal equipment such as snow plows, snow blowers, mowers, etc., shall have a refresher each year prior to the season to update property changes, safety and operational requirements.

A record of trained individuals for each attachment and piece of portable equipment shall be kept by Human Resources.

5.0 INSPECTIONS**A. DAILY INSPECTIONS**

All attachment and portable equipment Operators are required to perform an inspection of the equipment they intend to use prior to use. If the equipment has a defined Operator's Daily Check List, the operator shall use the ODCL to perform the inspection and give the Equipment Contact the completed ODCL Signature Sheet when full. If the machine fails the inspection or the ODCL, the operator shall tag out the machine as described in PPPL Procedure ESH-001. If the equipment does not have an ODCL, the Operator should follow the Operator's Manual description of hazardous conditions for the equipment. ODCL's will be maintained by Material Services, changes may be authorized by the Subject Matter Expert see Attachment 2. The inspections required due to changed frequency approved by the SME, will be noted on the ODCL signature Sheet as an inspection of that frequency (monthly).

A complete listing of Operator's Daily Check Lists for all equipment may be found at the follow site: <https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/>

The Signature Sheet will be given to the Equipment Contact's when full.

A minimum inspection without an ODCL shall include:

- i. Verification that inspection date on inspection sticker is current.
- ii. Check for loose or missing bolts, fasteners, covers or parts.
- iii. Inspect for damage to equipment.
- iv. Fuel level and fuel leaks.
- v. Check all other fluid levels.
- vi. Worn, frayed or damaged wires and hoses.
- vii. Function of controls.
- viii. Safety systems and interlocks function properly.

Chapter 5 Vehicle Attachments and Portable Equipment

MCR-ES-MECH-011,R2-003**B. PERIODIC INSPECTIONS**

Due to the variability of the types of equipment in this category, a complete list of each requirement is not feasible. It should be noted however that operators are expected to note when the equipment will need sharpening, balancing, leveling or other specific maintenance to keep the equipment in good condition and safe operating order.

The Equipment Custodian is responsible for assuring all required periodic inspections are scheduled and performed. All service reports shall be sent to the Fleet Coordinator for filing.

6.0 MAINTENANCE AND REPAIR

- A. No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly [29 CFR 1926.602(c)(ii)].
- B. Alterations to equipment may be made without manufacturer's approval if the manufacturer no longer exists, or if the manufacturer is unresponsive for more than a year, with the Subject Matter Expert's approval of the change and the concurrence of a Professional Engineer (Attachment 2).
- C. Requirements
 - i. Maintenance shall be performed according to the manufacturer's recommendations and as a minimum shall meet the requirements of OSHA, 29 CFR 1910, 29 CFR 1926, ESH-001 (Tagout).
 - a. Power plant shall be stopped and starting means rendered inoperative.
 - b. All controls in the off position and all operating systems secured.
 - c. Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
 - d. Other manufacturer specified precautions.
 - ii. A scheduled planned maintenance, lubrication and inspection system shall be followed based on the manufacturer's recommendations.
 - iii. Only qualified, trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect attachments and portable equipment.
 - iv. Unusual maintenance or repairs require consultation with the manufacturer.
 - v. All parts requiring replacement shall be replaced only by OEM parts equivalent as to the safety of those used in the original design.
 - vi. Repaired equipment shall be inspected prior to being returned to service by qualified inspectors or sub contractors. The service report (Attachment 3) will be signed by the inspector and the PTR and be given to the Fleet Coordinator, copy to the PTR.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 8 of 10
Chapter 5 Vehicle Attachments and Portable Equipment		

MCR-ES-MECH-011,R2-003

- vii. Safety switches and functionality shall not be impaired by service technicians unless required for the repair operation. Such impaired equipment shall be tagged as out of service until the safety impairment is removed.

D. PROCEDURE FOR OBTAINING MAINTENANCE AND REPAIR OF EQUIPMENT

Responsibility	Action
Equipment Custodian	1. Know where equipment is at all times and provide equipment for inspection.
Fleet Coordinator	2. Maintain the inspection records for periodic inspection/maintenance.
Lift Manager	3. Maintain due date to inspect equipment annually on Inspection Status List. If the maintenance or inspection is not completed the equipment shall be CAUTION tagged OUT OF SERVICE until such time as the required actions are completed, per PPPL Procedure ESH-001.
Lift Manager	4. Determine if equipment is to be kept in service. <ul style="list-style-type: none"> a. If equipment is not to be kept in service, Equipment Custodian to CAUTION tag item OUT OF SERVICE as per PPPL Procedure ESH-001.
Princeton Technical Representative (PTR) or designated escort (Qualified operator)	5. Determine when during the calendar year the equipment annual inspection/maintenance is due.
	6. Arrange for a qualified equipment inspector or a qualified subcontractor to perform the inspection/maintenance. (Annual PM or repair service) and obtains name of service repairman.
	7. Verifies repairman is qualified on the contract and submits site notification for repairman by name.
	8. Upon arrival, provides repair man with the annual maintenance schedule from https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/
	9. Directs repairman to PTR or designated escort (qualified operator).
	10. Directs repairman to equipment.
	11. Assures that repairman performs ODCL first.
	12. Verifies that repairman is using our annual maintenance schedule.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 9 of 10
Chapter 5 Vehicle Attachments and Portable Equipment		

MCR-ES-MECH-011,R2-003

Princeton Technical
Representative (PTR)
or designated escort
(Qualified operator)

13. Observes that repairman is performing work safely and observing the MAINTENANCE AND REPAIR REQUIREMENTS listed in 6.A, 6.B and 6.C.

NOTE: repairman must remove battery cable before working in engine compartment

NOTE: tag unit out if unit is to be left unattended during service or the service cannot be completed that day.

14. Verifies that repairman uses OEM parts when needed.

Qualified
Subcontractor

15. Perform required equipment maintenance per the manufacturer's recommendations and periodic inspection as per the equipment Inspection Criteria (Section 8.0 of this Chapter) under observation of PTR or their technically qualified designee.

Note: Prior to the commencement of any service or repair, the equipment shall be turned off with the key removed and in the possession of the repairman. Any potential energy (such as raised arms) shall be blocked or restrained. (Per OSHA response regarding 1910.147 - 9/27/95) Any sources of hydraulic pressure shall be removed or released. If the service or repair requires work in the engine compartment, then the equipment battery cable shall be disconnected (Cable shall be tagged with a Danger Tag if service person must be away from unit.)

16. Record the inspection/maintenance on the appropriate Inspection Report. Complete Service Report (Attachment 3) while onsite, sign it and give it to the PTR or their technically qualified designee.

17. Perform a final inspection with the ODCL, sign Signature Sheet.

PTR or Designee

18. Upon completion of work determine if deficiencies are found.
 - a. If no, sign and submit service report to Fleet Coordinator, copy to the PTR, and affix inspection sticker, showing expiration date to the equipment, and to the attachment if so equipped.
 - b. If yes, sign and submit service report to Fleet Coordinator, copy to PTR, and apply CAUTION tag OUT OF SERVICE per PPPL Procedure ESH-001.

19. Upon completion of work verifies that repairman performs final ODCL and safety check and assures proper operation of all safety or warning devices.

20. Checks repair documentation and signs service forms.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 10 of 10
Chapter 5 Vehicle Attachments and Portable Equipment		

MCR-ES-MECH-011,R2-003

- | | |
|-------------------|--|
| | 21. Upon completion of work directs repairman back to fleet coordinator. |
| Fleet Coordinator | 22. Upon receipt of invoice compares invoice to service report and contract to assure it is correct and recommends/approves invoice. |
| | 23. Review and file all service reports and update inspection status list.
Note: Maintenance/Inspection Reports are maintained for the life of the equipment. |
| | 24. Return to step 2 for each piece of equipment. |
| Equipment Contact | 25. Schedule a monthly equipment inspection and record inspection on ODCL form, ODCL forms are filed with the Operations Center.
Note: Monthly ODCL's will be maintained for the life of the vehicle. |

ATTACHMENTS:

1. Special Equipment User Summary of Safety Training
2. ODCL Change Request Form and Equipment Alteration Request Form
3. Service Report

Special Equipment User Summary of Safety Training

Summary of Safety Training for: _____

Name

- ☐ Initial Safety Training
☐ Renewal Safety Training

Part 1 Attachments

Read Operator's Manual and Trained on Equipment:

- | | |
|---|-------------|
| <input type="checkbox"/> Polaris Snow Plow | date: _____ |
| <input type="checkbox"/> Protech Sno Pusher | date: _____ |
| <input type="checkbox"/> Meyers Truck Plow | date: _____ |
| <input type="checkbox"/> Maxon Lift Gate | date: _____ |
| <input type="checkbox"/> Thieman Tail Gate | date: _____ |
| <input type="checkbox"/> Tommy Tail Gate | date: _____ |
| <input type="checkbox"/> Spreader | date: _____ |
| <input type="checkbox"/> Kelly Loading Dock | date: _____ |
| <input type="checkbox"/> _____ | date: _____ |

Part 2 Portable Equipment

Read Operator's Manual and Trained on Equipment:

- | | |
|---|-------------|
| <input type="checkbox"/> Pressure Washer | date: _____ |
| <input type="checkbox"/> Weed Whacker | date: _____ |
| <input type="checkbox"/> Clark Floor Scrubber | date: _____ |
| <input type="checkbox"/> Honda Snow Blowers | date: _____ |
| <input type="checkbox"/> Air Compressor | date: _____ |
| <input type="checkbox"/> Tennant Sweeper | date: _____ |
| <input type="checkbox"/> Miller Arc Welder | date: _____ |
| <input type="checkbox"/> Ariens Power Brush | date: _____ |
| <input type="checkbox"/> Stihl Chain Saw | date: _____ |
| <input type="checkbox"/> Echo Power Blower | date: _____ |
| <input type="checkbox"/> John Deere Sprayer | date: _____ |
| <input type="checkbox"/> Little Wonder Blower | date: _____ |
| <input type="checkbox"/> Red Max Blower | date: _____ |
| <input type="checkbox"/> _____ | date: _____ |
| <input type="checkbox"/> _____ | date: _____ |
| <input type="checkbox"/> _____ | date: _____ |
| <input type="checkbox"/> _____ | date: _____ |

Reviewed: _____

Shop Supervisor

date

Approved: _____

Training Specialist

date

**Chapter 5 Vehicle Attachments and Portable Equipment -
ODCL Change Request Form**

Page 1 of 2

MCR-ES-MECH-011,R2-003**Request to move inspection item from Daily to Monthly**

Equipment Type _____

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Item to be moved	Reason for move	Frequency of Inspection item is moved to

Requested By: _____ Date _____

Approved by: _____ Date _____
Subject Matter ExpertComments _____
_____Distribution: _____, _____, _____
_____, _____, _____

**Chapter 5 Vehicle Attachments and Portable Equipment -
Equipment Change Request Form**

Page 2 of 2

MCR-ES-MECH-011,R2-003

Approved form to be filed by Material Services with the ODCL Masters

2/12/13

Request to Alter Equipment with Engineering Decision

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Provide detail of changes/modifications requested and reasons:

Requested by: _____ Date _____

Approved by: _____ Date _____

Subject Matter Expert

Approved by: _____ Date _____

Professional Engineer

Comments _____

Distribution: _____, _____, _____

Approved form to be filed by Material Services in equipment file

2/12/13

Chapter 5 Vehicle Attachments and Portable Equipment - Service Report

MCR-ES-MECH-011,R2-003

PPPL Equipment Service Report

To be completed by PPPL	Equipment Type _____ Date _____
	Manufacturer _____ Model _____
	Serial Number _____
	Property Number _____
To be completed by Service Technician	Equipment Problem/Service Requested: _____ Requestor: _____ - _____ _____ _____
	Work/Service Performed and comments: _____ _____ _____ _____ _____ _____ _____

When service work has been completed:

1. Perform Operator's Daily Checklist Inspection
2. Every Inspection – Check that all safety devices, interlocks, lights and alarms are functioning properly
3. All product recalls and safety improvements have been installed.

Sat	Unsat
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

NOTE: Any and all malfunctioning safety devices, interlocks, lights and alarms must be brought to the immediate attention of the PPPL escort regardless of the nature of the service call.

Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL)
INSPECTOR (PRINT): _____ SIGNATURE: _____ DATE: _____
Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL – TAGGED OUT, PTR NOTIFIED)
Escort (PRINT): _____ SIGNATURE: _____ DATE: _____

This form must be completed at end of service call, give to Fleet Coordinator, copy to PTR

MCR-ES-MECH-011,R2-003

Additional writing space on reverse

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 1 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

Table of Contents

1.0 INTRODUCTION.....	2
2.0 DEFINITIONS	2
3.0 OPERATIONS	4
4.0 ODCL SIGN OFF SHEET	6
5.0 TRAINING	7
6.0 OPERATOR COMPETENCY EVALUATION CHECKLIST – UTILITY VEHICLES	9
7.0 INSPECTIONS.....	11
8.0 ODCL SIGN OFF SHEET	12
9.0 MAINTENANCE AND REPAIR	13
10. 0RECORDS	16

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 2 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

1.0 INTRODUCTION

A Utility Vehicle (UTV) is a vehicle that can travel usually not over 25 miles per hour and has a payload capacity not exceeding 10,000 lbs. These vehicles are also referred to as personnel and burden carriers. The Polaris Ranger and the John Deere Gators will normally be used as an UTV however they are classified as ATVs and as such require special operating rules in some situations. The ClubCar Carryall Utility Vehicle is not an ATV. No UTV or ATV is permitted to be operated on a public roadway.

2.0 DEFINITIONS

Attachment – Tool that is usually mounted to a vehicle or other equipment to perform a special function that may be different than the normal usage for the base equipment.

Authorized Person – Personnel approved or assigned to perform a specific type of duty or duties at a specific location or locations at a work site.

Carrier, personnel and burden – a mobile, power-driven machine, which is not self-loading, used for transporting material and/or personnel on indoor and outdoor improved surfaces, but not for use on public roads

Competent Person (OSHA) – One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate them. The link to the PPPL list of OSHA Competent person is <http://spportal.pppl.gov/bp/Lists/PPPL%20Experts/AllItems.aspx>.

Equipment Contact Individual having physical possession of government personal property items (capital, controlled, other accountable, sensitive, high risk and administratively controlled) charged to their care. Usually reports organizationally or functionally to the custodian.

Equipment Custodian – Individual designated by Division/Department Head or Project Administrator for a particular functional or organizational area of responsibility (usually at section head level or higher). This individual maintains liaison with Material Services Property Management personnel regarding inventories, equipment spot-checks, property loans, intra-lab permanent transfer of property, disposal and other actions/problems regarding equipment within their assigned functional area.

Fleet Coordinator – The Fleet Coordinator is the person in the Material Control Group assigned to maintain DOE required documentation regarding the status of all government owned vehicles at PPPL.

Hot Tapping – A disallowed unsafe practice of installing or removing an attachment to a piece of equipment while the equipment is running and/or while the hydraulic or electrical systems required are energized.

Modification – To make a change to equipment that affects the operation, stability, safety factors, rated load or safety of the Special Equipment or attachment in any way.

Chapter 6 Utility Vehicles

MCR-ES-MECH-011,R2-003

Nameplate - The manufacturer's plate attached to the vehicle that lists the vehicle capacity, approved modifications and attachments.

OEM – Original Equipment Manufacturer

Operation – Performance of functions of Special Equipment within the scope of its specifications and in accordance with the manufacturer's instructions, the PPPL's work rules and applicable government regulations.

Operator's Daily Check List (ODCL) – The checklist to be used by the operator to inspect the Special Purpose Equipment at the start of every shift and used to log safety and operating issues that arise during the shift. The ODCL will be kept on the machine until shift end and then be given to the Supervisor for filing.

Operator's Manual – The manual(s) supplied by the manufacturer with operation, inspection, maintenance, repair requirements, and may also include specifications and other information. The manual may only be updated and/or replaced by the Equipment Custodian who will be responsible for the proper distribution of the new manual.

Powered Functions – Those functions which control motion of the Special Purpose Equipment or Attachment and are caused by electro-mechanical, hydraulic or pneumatic forces.

Power Plant – Is defined as the power source for a piece of equipment.

Princeton Technical Representative – Individuals designated as PTRs must have successfully completed the following training courses: a. General Employee Training; b. Subcontract Administration for Princeton Technical Representatives; c. Hazard Awareness (JHA training).

Qualified Inspector - An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated an ability to recognize, evaluate and resolve concerns regarding. This function will usually be performed by a Factory Authorized Service Representative.

Qualified Instructor – An individual with experience, training, or education in Systematic Approach to Training (SAT) Methods and presentation techniques. These individuals are capable of developing training courses and materials, approving training courses and materials developed by other instructors, presenting classroom and On-the-Job instruction, evaluating trainees, and evaluating training programs.

Qualified Person – An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated an ability to recognize, evaluate and resolve concerns regarding the specific subject matter.

Qualified Operator – A qualified person who controls the movement and use of equipment.

Qualified Subcontractor - One whose qualifications have either been evaluated and accepted by the Procurement Technical Representative or whose parent company qualification program has

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 4 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

been evaluated and accepted by the PTR and the individual carries documentation (e.g. card) which shows completion of approved training.

Safety Interlock – A switch used to shut down, lock out and prevent the accidental use of equipment. The interlock by itself does not control all hazardous energy. The interlock is usually positioned in such a manner as to be engaged when the operator is not in the proper location within the vehicle.

Shall – The word shall is to be understood as being mandatory.

Subject Matter Expert – An individual with prerequisite background or experience necessary for instructional competency in a specific subject, task, or field of knowledge. Such an individual is qualified by education, training, or experience, and is a recognized expert on a particular subject, task, or system. These individuals are capable of developing training courses and materials, presenting classroom and On-the-Job instruction, and evaluating trainees, within their subject area. The SME for Utility Vehicles is the Fleet Coordinator.

3.0 OPERATIONS

3.1 OPERATING PROCEDURE

Responsibility	Action
UTV Operator	<ol style="list-style-type: none"> 1. Verify the operator is carrying a current valid driver's license. 2. Perform a daily inspection for the UTV using the ODCL. 3. Perform a function test on the UTV. 4. Confirm the locations the UTV is to be used is suitable for its capabilities. 5. All persons shall use seatbelts when the vehicle is moving. 6. Operate UTV safely to transport personnel and/or material. 7. Avoid other vehicles while operating on paved surfaces. 8. Park UTV following manufacturer's parking procedures. 9. Submit the full ODCL signature sheet to the Equipment Contact.
Equipment Contact	<ol style="list-style-type: none"> 10. Check UTV periodically to assure that completed sign off sheets are turned in. Submits all completed sign off sheets to their supervisor.
Supervisor	<ol style="list-style-type: none"> 11. Signs and send the Signature Sheet to the Operations Center for filing. 12. Periodically check that the ODCL has been performed on the UTV, initial and date the ODCL.
UTV Custodian	<ol style="list-style-type: none"> 13. Schedule UTV for required inspections and maintenance.

Chapter 6 Utility Vehicles

MCR-ES-MECH-011,R2-003

3.2 OPERATIONS REQUIREMENTS

- A. An ODCL inspection shall be performed before use every day, the ODCL signature sheet shall be kept on the UTV until the sheet is full and given to the supervisor to be filed. If the machine fails the ODCL, the operator shall tag out the machine as described in PPPL Procedure ESH-001.
- B. Prior to the operation of the UTV, the operator shall have read the operator's manual for the particular vehicle and any attachments being operated.
- C. If at any time the UTV is found to be in need of repair, defective, or in any way unsafe, the UTV shall be tagged out of service until restored to a safe operating condition as per PPPL Procedure ESH-001.
- D. The UTV operator shall use proper personal protection during the operation of the UTV.

Note: The use of safety glasses, hard hat, gloves and steel toed shoes, along with cab netting (for the Polaris machines), is required during use on conditions other than paved surfaces, maintained gravel roads or kept grounds.

- E. Fuel tanks shall not be filled with the engine running, refueling or recharging must follow the procedures defined in ES-MECH-014, Refueling and Recharging Vehicles and Equipment.
- F. No UTV shall be operated with a leak in the fuel system.
- G. Equipment custodian shall keep and maintain a copy(ies) of the operating and maintenance manual(s) for the UTV and all attachments in the weather resistant storage compartment provided by the manufacturer. The manual(s) is (are) considered an integral part of the UTV and is vital to communicate necessary safety information to users and operators.
- H. Don't drive a UTV across steep slopes. Drive straight up or down the slope with the UTV pointed in the direction of travel.
- I. Don't park the UTV on a hill or slope.
- J. UTVs shall not be operated at speeds greater than 25 MPH.

3.3 TRANSPORTING, TOWING OR LIFTING THE UTV

If the UTV is to be transported, towed or lifted, the operator shall follow all of the manufacturer's requirements found in the manual for the unit. A Qualified Rigger shall be used for any rigging required for lifting. A Qualified Crane Operator shall perform the lift.

3.4 USING THE UTV TO TOW

If it is necessary to use the UTV to tow a trailer or other object, follow the manufacturer's procedures and requirements listed in the operator's manual for the particular UTV.

3.5 UTV ATTACHMENTS

If the use of attachments on the UTV is required, follow the manufacturer's procedures and requirements listed in the operator's manuals for the particular UTV and attachment and assure the requirements listed in Chapter 5, Attachments and Portable Equipment, of this Standard have been met.

Prop. #: _____

Date _____

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 7 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

5.0 TRAINING

A. INITIAL TRAINING AND QUALIFICATION RESPONSIBILITIES

This section details the training and qualification requirements for Utility Vehicle Operators. Qualified personnel or trainees shall be at least 18 years old, have a valid and current driver's license, be able to read and understand the posted warning labels on the UTV and be able to understand the Instructor.

Responsibility	Action
Candidate's Supervisor or Manager	1. Determine the qualification required and requests training and qualification of personnel by contacting Human Resources.
Human Resources	2. Select a qualified instructor to provide classroom training, practical training, and required tests, as applicable. [Courses are approved using Procedure TR-001 or outside training approved by Subject Matter Expert.]
	3. Schedule training video and makes all necessary logistical arrangements for the training, verifies that candidate has a valid driver's license.
	4. Notify the candidate(s) of scheduled training and arranges for practical training, as necessary, verifies that candidate has a valid driver's license.
Qualified Instructor	5. Provide the appropriate training and testing. The candidate is evaluated on the UTV and each type of attachment to be used and the instructor documents the training on a Utility Vehicle Competency Evaluation Checklist (see examples in Section 6.0). Sign evaluation.
Human Resources	6. Maintain training records.

B. TRAINING REQUIREMENTS

The training requirements for UTV operators must cover the following topics:

- i. Candidate must read the Operator's Manual

MCR-ES-MECH-011,R2-003

- ii. Passengers, material loads, carrier operator and other persons safety
- iii. General safety rules
- iv. Equipment and controls instruction
- v. Operating surface requirements
- vi. Inspection requirements
- vii. Use of Caution tags per PPPL Procedure ESH-001

C. TRAINING AND QUALIFICATION

	Utility Vehicle Operator
Prerequisite	Valid Driver's License
Read Operator's Manual	Yes
Operations and Hazards Video	Yes
Practical Instruction (OJT) and Competency Evaluation	Yes

5.1 ATTACHMENTS

All personnel using UTV attachments and related components shall be trained and qualified to understand the requirements of the specific equipment operation, safety concerns and daily inspection and shall be qualified UTV operators.

To become attachment qualified, the operator must have read the operator's manual and have a training session with a designated instructor showing proper care of usage and safety requirements during hands on training session with the equipment. The operator must also have PPE training to properly identify and use the PPE required for use of the equipment.

Chapter 6 Utility Vehicles

MCR-ES-MECH-011,R2-003

**6.0 OPERATOR OJT AND COMPETENCY EVALUATION CHECKLIST –
UTILITY VEHICLES**

UTILITY VEHICLE OPERATOR COMPETENCY EVALUATION

Operator's Name _____ Date _____
Please PrintInstructor _____ Supervisor _____
Please Print Please Print**Vehicle(s) tested on:***For each statement below, check either S (Satisfactory) or U (Unsatisfactory)*

S U

1. Performed Operator's Daily Check List**a. Read and understood warning labels on utility vehicle****2. Started vehicle properly****a. Used correct steering technique for machine****b. Used seat belt****c. Used dump function properly**

N/A _____

3. Demonstrated proper maneuvering skills:**a. Started vehicle smoothly****b. Approached work properly****c. Positioned load properly and squarely****d. Unloaded/placed load properly****e. Traveled with load safely up and downhill****f. Performed both forward and reverse turns****g. Performed K turn properly****h. Maintained proper speed****i. Looked in direction of travel****j. Cleared obstacles by safe distance****k. Demonstrated acceptable depth perception****l. Demonstrated acceptable auditory skills****4. Drove in reverse properly****5. Parked and shut down vehicle correctly**

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 10 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

6.0 Operator OJT and Competency Evaluation Checklist – Utility Vehicles (continued)

<i>For each statement below, check either S (Satisfactory) or U (Unsatisfactory)</i>		
	S	U
6. Used proper position of all controls, switches, parking brakes when machine was left unattended	_____	_____
7. Mounted and dismounted properly	_____	_____
8. Refueled vehicle properly	_____	_____
9. Attachment _____	_____	_____
a. Correctly mounted attachment	_____	_____
b. Properly performed function of attachment	_____	_____
c. Correctly removed attachment	_____	_____
10. Attachment _____	_____	_____
a. Correctly mounted attachment	_____	_____
b. Properly performed function of attachment	_____	_____
c. Correctly removed attachment	_____	_____
11. Attachment _____	_____	_____
a. Correctly mounted attachment	_____	_____
b. Properly performed function of attachment	_____	_____
c. Correctly removed attachment	_____	_____
12. Operator Performance	_____	_____

Restrictions:

Comments: _____

Approved By: _____

TR-Form-55 REV 1 6/2016

Instructor's Signature

Chapter 6 Utility Vehicles

MCR-ES-MECH-011,R2-003

7.0 INSPECTIONS**A. DAILY INSPECTION**

ODCL's shall be maintained by Material Services, changes may be authorized by the Subject Matter Expert see Attachment 1. Before use each day or at the beginning of each shift, the UTV shall be given an Operator's Daily Check List (Section 4.0) inspection consisting of visual inspection and functional tests including but not limited to the following:

- i. General appearance.
- ii. Fuel lines and fittings for signs of leakage, wear or other damage or cables, electrical components and wiring harness.
- iii. Tires.
- iv. Engine oil level.
- v. Fuel levels.
- vi. All signs and warning labels are in place and readable.
- vii. Guards and shields are in place.
- viii. Nuts and bolts are tight.
- ix. Warning Devices function correctly.
- x. Lights and battery(s) function correctly and are clean.
- xi. Speed and directional controllers operate correctly.
- xii. Brakes and safety interlocks function properly.
- xiii. Steering mechanism operates correctly.

The daily ODCL shall be maintained in holders installed on UTV. The ODCL inspector will sign the Signature Sheet at the completion of the inspection if there are no concerns. The Signature Sheet will be given to the UTV's Contact's Supervisor when full. The Supervisor will send the Signature Sheet to the Operations Center for record keeping.

If during the inspection of the UTV it is found to be in need of repair or becomes unsafe in any way, it shall be reported to the operator's supervisor immediately and the UTV shall be tagged out, in accordance with PPPL Procedure ESH-001, and not be operated until repaired and restored to a safe operating condition. The Operator's Supervisor will contact the PTR for service.

B. PERIODIC INSPECTION

Frequent and Annual inspections shall be made based on the manufacturer's requirements specified in the manual provided by the manufacturer. These inspections must be conducted by an individual who is qualified to perform the level of work required at the inspection interval. The Fleet Coordinator is responsible for assuring all required periodic inspections are scheduled and performed. All inspection reports shall be given to the Fleet Coordinator for filing. ODCL's will be maintained by Material Services.

ODCL INSPECTION SIGN OFF

Prop. #: _____

[illegible]

Date _____

9.0 MAINTENANCE AND REPAIR

Note: No modifications or additions which affect the capacity or safe operation of the UTV shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly [29 CFR 1926.602(c)(ii)].

A. REQUIREMENTS

- i. Maintenance shall be performed according to the manufacturer's recommendations and as a minimum shall meet the requirements of OSHA 29 CFR 1910, OSHA 29 CFR 1926, ESH-001 (Tagout).
 - a. Power plant shall be stopped and starting means rendered inoperative.
 - b. All controls in the off position and all operating systems secured from inadvertent motion by brakes, blocks or other means.
 - c. Hydraulic oil pressure relieved from all hydraulic circuits before loosening or removing hydraulic components.
 - d. Prior to the commencement of any service or repair, the UTV shall be turned off with the key removed and in the possession of the repairman. Any potential energy (such as raised dump body) shall be blocked or restrained. (Per OSHA response regarding 1910.147 - 9/27/95) Any sources of hydraulic pressure shall be removed or released. If the service or repair requires work in the engine compartment, then the UTV battery cable shall be disconnected (Cable shall be tagged with a Danger Tag if service person must be away from unit.
 - e. Other manufacturer specified precautions.
- ii. A scheduled planned maintenance, lubrication and inspection system shall be followed based on the manufacturer's recommendations.
- iii. Only qualified, trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect the UTV.
- iv. Unusual maintenance or repairs require consultation with the manufacturer.
- v. All parts requiring replacement shall be replaced only by OEM parts equivalent as to the safety of those used in the original design.
- vi. The UTV shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts.
- vii. Repaired utility vehicles shall be inspected using the ODCL and the Service Report prior to being returned to service by qualified inspectors or sub contractors. The service report will be signed by the inspector and the PTR and be given to the Fleet Coordinator to be filed in the UTV's file.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 14 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

- viii. Safety devices and functionality shall not be impaired by service technicians unless required for the repair operation. If such impairment is necessary, the UTV shall be tagged as out of service until the safety impairment is removed.
- ix. Alterations to UTV's may be made without manufacturer's approval if the manufacturer no longer exists, or if the manufacturer is unresponsive for more than a year, with the Subject Matter Expert's approval of the change and the concurrence of a Professional Engineer (Attachment 1).
- x. If modifications may degrade or have deleterious effects on safety features safe operations, then Engineering approval is needed. Added safety features such as back-up beepers would not need Engineering approval.

B. PROCEDURE FOR OBTAINING MAINTENANCE AND REPAIR FOR A UTV

Responsibility	Action
----------------	--------

- | | |
|---------------------|--|
| Equipment Custodian | 1. Know where UTV is at all times and provide UTV for inspection. |
| Fleet Coordinator | 2. Maintain the inspection records for periodic inspection/maintenance. |
| | 3. Maintain due date to inspect UTV annually on Inspection Status List. If the maintenance or inspection is not completed the UTV shall be CAUTION tagged OUT OF SERVICE until such time as the required actions are completed, per PPPL Procedure ESH-001. |
| Lift Manager | 4. Determine if UTV is to be kept in service. <ul style="list-style-type: none"> a. If UTV is not to be kept in service, Equipment Custodian to CAUTION tag item OUT OF SERVICE as per PPPL Procedure ESH-001. |
| Fleet Coordinator | 5. A scheduled planned maintenance, lubrication, and inspection system shall be followed using the manufacturer's recommendations. At a minimum, an annual inspection shall be performed using the form found for each piece of equipment listed at:
https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/ .

More frequent inspections may be required based on the equipment's usage and hour meter as determined by the equipment contact and SME. |
| | 6. Arrange for a qualified UTV inspector or a qualified subcontractor to perform the inspection/maintenance. (Annual PM or repair service) and obtains name of service repairman. |
| | 7. Verifies repairman is qualified on the contract and submits site notification for repairman by name. |

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 15 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

- | | |
|--|---|
| Princeton Technical Representative (PTR) or designated escort (Qualified operator) | 8. Upon arrival, provides repair man with the annual maintenance schedule from https://sites.google.com/a/pppl.gov/equipment-safety-inspection-list/
9. Directs repairman to PTR or designated escort (qualified operator).
10. Directs repairman to equipment.
11. Assures that repairman performs ODCL first.
12. Verifies that repairman is using our annual maintenance schedule. |
| Princeton Technical Representative (PTR) or designated escort (Qualified operator) | 13. Observes that repairman is performing work safely and observing the MAINTENANCE AND REPAIR REQUIREMENTS listed in 9.A.
NOTE: repairman must remove battery cable before working in engine compartment
NOTE: tag unit out if unit is to be left unattended during service or the service cannot be completed that day.
14. Verifies that repairman uses OEM parts when needed. |
| Qualified Subcontractor | 15. Perform required UTV maintenance per the manufacturer's recommendations and periodic inspection as per the UTV Inspection Criteria (Section 8.0 of this Chapter) under observation of PTR or their technically qualified designee. |
- Note: Prior to the commencement of any service or repair, the UTV shall be turned off with the key removed and in the possession of the repairman. Any potential energy shall be blocked or restrained. (Per OSHA response regarding 1910.147 - 9/27/95) Any sources of hydraulic pressure shall be removed or released. If the service or repair requires work in the engine compartment, then the UTV battery cable shall be disconnected (Cable shall be tagged with a Danger Tag if service person must be away from unit.)
- | | |
|-----------------|--|
| PTR or Designee | 16. Record the inspection/maintenance on the appropriate Inspection Report. Complete Service Report (Attachment 2) while onsite, sign it and give it to the PTR or their technically qualified designee.
17. Perform a final inspection with the ODCL, sign Signature Sheet.
18. Upon completion of work determine if deficiencies are found. <ul style="list-style-type: none"> a. If no, sign and submit service report to Fleet Coordinator, copy to the PTR, and affix inspection sticker, showing expiration date to the UTV, and to the attachment if so equipped. b. If yes, sign and submit service report to Fleet Coordinator, copy to PTR, and apply CAUTION tag OUT OF SERVICE per PPPL Procedure ESH-001. |
|-----------------|--|

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 16 of 18
Chapter 6 Utility Vehicles		

MCR-ES-MECH-011,R2-003

19. Upon completion of work verifies that repairman performs final ODCL and safety check and assures proper operation of all safety or warning devices.
 20. Checks repair documentation and signs service forms.
 21. Upon completion of work directs repairman back to fleet coordinator.
- Fleet Coordinator
22. Upon receipt of invoice compares invoice to service report and contract to assure it is correct and recommends/approves invoice.
 23. Review and file all service reports and update inspection status list.
Note: Maintenance/Inspection Reports are maintained for the life of the UTV.
 24. Return to step 2 for each UTV.
- Equipment Contact
25. Schedule a monthly UTV inspection and record inspection on ODCL form, ODCL forms are filed with the Operations Center.
Note: Monthly ODCL's will be maintained for the life of the vehicle.

10.0 RECORDS

- A. Inspection reports shall be maintained by Material Services.
- B. Non-destructive examination reports shall be prepared by the contractor and retained by Material Services.
- C. Records shall be retained in the Material Services Transportation Services master files for the life of the equipment while at PPPL.

ATTACHMENTS:

1. ODCL Change Request Form
2. Service Report

Request to move inspection item from Daily to Monthly

Equipment Type _____

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Item to be moved	Reason for move	Frequency of Inspection item is moved to

Requested By: _____ Date _____

Approved by: _____ Date _____
Subject Matter ExpertComments _____
_____Distribution: _____, _____, _____
_____, _____, _____

Approved form to be filed by Material Services with the ODCL Masters

2/12/13

**Chapter 6 Utility Vehicles - Request to Alter Equipment
with Engineering Decision**

Page 2 of 2

MCR-ES-MECH-011,R2-003

Request to Alter Equipment with Engineering Decision

Manufacturer _____ Model _____

Serial Number(s) _____

Property Number(s) _____

Equipment Contact(s) _____

Equipment Custodian(s) _____

Subject Matter Expert _____

Provide detail of changes/modifications requested and reasons:

Requested by: _____ Date _____

Approved by: _____ Date _____

Subject Matter Expert

Approved by: _____ Date _____

Professional Engineer

Comments _____

Distribution: _____, _____, _____

Approved form to be filed by Material Services in equipment file

2/12/13

Chapter 6 - Service Report

Page 1 of 2

MCR-ES-MECH-011,R2-003

PPPL Equipment Service Report

To be completed by PPPL	Equipment Type _____ Date _____
	Manufacturer _____ Model _____
	Serial Number _____
	Property Number _____
To be completed by Service Technician	Equipment Problem/Service Requested: _____ Requestor: _____ - _____ _____ _____
	Work/Service Performed and comments: _____ _____ _____ _____ _____ _____ _____

When service work has been completed:

1. Perform Operator's Daily Checklist Inspection
2. Every Inspection – Check that all safety devices, interlocks, lights and alarms are functioning properly
3. All product recalls and safety improvements have been installed.

Sat	Unsat
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

NOTE: Any and all malfunctioning safety devices, interlocks, lights and alarms must be brought to the immediate attention of the PPPL escort regardless of the nature of the service call.

Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL)
INSPECTOR (PRINT): _____ SIGNATURE: _____ DATE: _____
Check One: <input type="checkbox"/> (PASS – SATISFACTORY TO USE) <input type="checkbox"/> (FAIL – TAGGED OUT, PTR NOTIFIED)
Escort (PRINT): _____ SIGNATURE: _____ DATE: _____

This form must be completed at end of service call, give to Fleet Coordinator, copy to PTR

MCR-ES-MECH-011,R2-003

Additional writing space on reverse

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 1 of 9
Chapter 7 Procurement		

MCR-ES-MECH-011,R2-003

Table of Contents

1.0 INTRODUCTION.....	2
2.0 SKID STEER VEHICLES	2
3.0 ATTACHMENTS	3
4.0 PORTABLE EQUIPMENT	3
5.0 UTILITY VEHICLES	4
6.0 DOCKBOARDS	4
7.0 SERVICE AND REPAIR.....	4
8.0 REQUIREMENTS FOR PROCURING SPECIAL PURPOSE EQUIPMENT SERVICES	5

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 2 of 9
Chapter 7 Procurement		

MCR-ES-MECH-011,R2-003

1.0 INTRODUCTION

All personnel involved in the procurement of Special Purpose Equipment, related components and Special Purpose Equipment Services shall be technically qualified and understand the needs and requirements of the specific Special Purpose Equipment operation, inspection, maintenance and repair in order to satisfy the requirements of the PPPL Procurement Policies and Procedures Manual and QA-020 Identifying and Dispositioning Suspect Parts.

Acquisitions for all Special Purpose Equipment must be approved by Industrial Hygiene (IH) in consultation with Material Services, Facilities and Site Services Division and the Lift Manager (the Lift Manager does not review Utility Vehicles) by using Form 8.13-2, Non-Chemical Requisition Review Sheet (as described in Section 8, Chapter 13 of ESHD 5008).

It is the responsibility of the requisitioner to assure that all relevant extracts, including training and necessary documentation, of this Engineering Standard are on the Requisition, Statement of Work or Specification prior to being submitted for approval.

2.0 SKID STEER VEHICLES

- A. Seat belts shall be provided, and they shall meet the requirements of the Society of Automotive Engineers (SAE) standard, Seat Belts for Construction Equipment (J386–1969) [29 CFR* 1926.602(a)(2)].
- B. All bidirectional machines shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction [29 CFR 1926.602(a)(9)(i)].
- C. Scissors points on all front end loaders, which constitute a hazard to the operator during normal operation, shall be guarded [29 CFR 1926.602(a)(10)].
- D. Manufacturer shall supply documentation and instruction manuals regarding operation, maintenance, employee training, inspections, lubrication, repair, operating and safety concerns for the purchased skid steer.
- E. Equipment manufactured on or after September 1, 1972, shall be equipped with ROPS which meet the minimum performance standards prescribed in 29 CFR 1926.1001 and 1926.1002 or shall be designed, fabricated, and installed in a manner which will support, based on the ultimate strength of the metal, at least two times the weight of the equipment applied at the point of impact [29 CFR 1926.1000(b) and 1926.1000(c)(2)].
- F. To conform with ANSI recommended practices, manufacturers must do the following:
 - i. Provide warnings, operator instructions, and service procedures.
 - ii. Equip the machine with seat belts.
 - iii. Provide a means to prevent the lift arm from lowering when the operator is entering or exiting from the machine.
 - iv. Provide handholds and steps to facilitate entry and exit from the loader.
 - v. Provide ROPS with side screens and a FOPS system.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 3 of 9
Chapter 7 Procurement		

MCR-ES-MECH-011,R2-003

- vi. Provide two openings for emergency exit.
- vii. Provide safety signs and instructions to warn of hazards during normal operations and servicing.

3.0 ATTACHMENTS

Acquisitions for all Special Purpose Equipment attachments and vehicle attachments must be approved by Material Services, Facilities and Site Services Division and the Lift Manager by using Form 8.13-2, Non-Chemical Requisition Review Sheet (as described in Section 8, Chapter 13 of ESHD). Consideration must be used for the type equipment that will have the attachment attached, its purpose and the location it is to be used.

Attachments must comply with the requirements listed:

- A. The attachment must be compatible with the equipment it will be mounted on.
- B. The attachment must have a plate describing the capacity of the attachment.
- C. Manufacturer shall supply documentation and instruction manuals regarding operation, maintenance, employee training, inspections, lubrication, repair, operating and safety concerns for the purchased attachment.
- D. The SME may require a load test certificate be provided by the manufacturer referencing the specific attachment, date of test, and amount of load applied. The proof test shall be signed by the manufacturer's authorized representative.
- E. Supplier shall provide initial employee training for operation and maintenance.

4.0 PORTABLE EQUIPMENT

Acquisitions for all Portable Equipment must be approved by the Subject Matter Expert by using Form 8.13-2, Non-Chemical Requisition Review Sheet (as described in Section 8, Chapter 13 of ESHD). Consideration must be used for the type equipment, its purpose and the location it is to be used. Consideration must also be given to using a purchased service in place of purchasing equipment and maintaining a training program for low usage frequency items.

- A. Manufacturer shall supply documentation and instruction manuals regarding operation, maintenance, employee training, inspections, lubrication, repair, operating and safety concerns for the purchased attachment.
- B. Prior to the purchase of portable equipment, the location for the safe storage of the equipment must be determined with consideration for fuel types, charging requirements and any other safety related issues.
- C. Supplier shall provide initial employee training for operation and maintenance.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 4 of 9
Chapter 7 Procurement		

MCR-ES-MECH-011,R2-003

5.0 UTILITY VEHICLES

- A. Utility Vehicles may be acquired by any department with Department Head and IH approval. Lift Manager approval is not required.
- B. There are no standard requirements for the purchase of a Utility Vehicle other than the vehicle should have a horn and seatbelts and meet the needs of the Department Head.

6.0 DOCKBOARDS

Acquisitions for all dockboards must approved by Material Services, Facilities and Site Services Division and/or the PPPL Lift Manager as appropriate by using Form 8.13-2, Non-Chemical Requisition Review Sheet (as described in Section 8, Chapter 13 of ESHD 5008). Consideration must be used for the type equipment that will use the dockboard and the location it is to be used. The dockboard must have the load capacity, width, height differential and the length to safely meet the application it is to be used for. All dockboards shall be marked conspicuously with their capacity.

- A. Portable and powered dockboards shall be strong enough to carry the load imposed on them.
- B. Portable dockboards shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping.
- C. Powered dockboards shall be designed and maintained so that one end will have a substantial contact with the dock and the other end with the transport vehicle to prevent slippage.
- D. Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.
- E. Dockboards shall be marked conspicuously with their carrying capacity.
- F. All dockboards shall have high friction surfaces.

7.0 SERVICE AND REPAIR

- A. Subcontracts for equipment maintenance, repair and inspections prepared by the Subject Matter Expert and approved by the Responsible Line Manager per ENG-006. The Princeton Technical Representative, assigned per ENG-006, shall be trained to function in that position and ensure that all requirements regarding training, qualifications, safety and authorization in PPPL Policy P-072 have been met prior to any work being performed.
- B. All Maintenance and repair contracts will require that an inspection of the equipment is performed after the work is completed verifying that all safety equipment functions correctly and that the vehicle is safe to use and working properly.
- C. All repairs must comply with and be performed following the requirements of the Maintenance and Repair Sections of this standard.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 5 of 9
Chapter 7 Procurement		

MCR-ES-MECH-011,R2-003

8.0 REQUIREMENTS FOR PROCURING SPECIAL PURPOSE EQUIPMENT SERVICES

8.1 SPECIAL PURPOSE VEHICLES

PPPL requires conformance with all applicable OSHA, ANSI and ASME Standards regarding Backhoe, Skid Steer and other Special Purpose Equipment (SPE) applications. Procurement shall ensure the following requirements are passed down to all sub-tiered contractors and the PPPL Procurement Technical Representative shall ensure that the PPPL Lift Manager is notified in a timely fashion to verify compliance with all requirements. A checklist is provided at the end of this document for convenience. Please note that failure to abide by the suggested advance notice may result in disallowance of the Special Purpose Equipment onsite. These requirements shall include but are not limited to adherence to:

§ OSHA 1926 Subpart P
NIOSH Skid Steer Alert
§ OSHA 1910.178 - Powered industrial trucks.
§ OSHA 1910.184 - Slings.

In addition to these standards, PPPL requires the following:

- a) Procedural Steps - Prior to award, proposing Special Purpose Equipment (SPE) subcontractor shall provide details of all SPE procedures, including references to Digging Permits (see next paragraph) and proposed equipment to be used.
- b) PPPL requires integration of PPPL requirements per Policy P-072 for all subcontracted work.
- c) Digging Permits - Prior to any excavation, SPE subcontractor shall provide a Dig Plan for review and approval as per ENG-024, including:
 - 1. Plan view of excavation with dimensions, including any nearby structures or power lines. Ensure that all SPE locations are identified with dimensions.
 - 2. Plan view generated from the use of Ground Penetrating Radar showing all underground utilities, piping and obstacles.
 - 3. Soil analysis of excavation work site and cave in mitigation plans.
 - 4. Name and Qualifications of designated OSHA Competent Person for dig.
- d) Dig Execution
 - 1. ASME Hand Signals with clear lines of sight shall be used at all times.
 - 2. If any lifting is to be performed by Special Purpose Equipment, the rigger must be a Qualified Rigger, the slings shall be inspected and in good condition and the lifting equipment shall be configured to perform lifts safely.
 - 3. Any unusual conditions shall be brought to the PPPL contract representative's attention immediately.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 6 of 9
Chapter 7 Procurement		

MCR-ES-MECH-011,R2-003

4. Everyone has stop work authority.
 5. The OSHA Competent Person shall be in attendance of the dig at all times.
- f) Special Equipment Operator Qualifications - Prior to any dig, the SPE subcontractor shall provide the designated SPE operators qualifications including:
 1. Special Equipment Operators License.
 2. Discussion of recent and frequent experience with proposed equipment.
 - h) Qualified Rigger and Qualified Signal Person Certifications - Prior to any lift or rigging, SPE subcontractor shall provide Qualified Rigger and Qualified Signal Person Certifications in accordance PPPL ES-MECH-007.
 - i) PPPL requires strict adherence to OSHA. Standard 29 CFR 1910.179(n)(3)(vi) states that "The employer shall require that the operator avoid carrying loads over people." OSHA Standard 29 CFR 1926.550(a)(19) "All employees shall be kept clear of loads about to be lifted and of suspended loads."
 - j) All equipment operators shall perform an ODCL inspection every day on their equipment.
 - k) All equipment operators must understand PPPL tagout procedures and shall tagout any equipment that fails the ODCL.
 - l) Proof of a current periodic inspection for each piece of equipment shall be provided to the Lift Manager 3 days prior to the equipment coming on site.

8.2 PORTABLE EQUIPMENT

All Purchased Services Contracts that include the need for Portable Equipment to perform the service must meet the following requirements:

- A. The Portable Equipment operators must be qualified to operate the Portable Equipment and the subcontractor shall provide proof of the qualification to the Procurement Technical Representative.
 - i. The qualification must show that the use of equipment safety interlocks and warning devices were part of the qualification.
- B. The Portable Equipment operators shall perform an ODCL inspection every day on the Portable Equipment.
- C. The Portable Equipment operators shall tagout any equipment that fails the ODCL.
- D. Proof of a current periodic inspection for each Portable Equipment, if required, shall be provided to the PTR 3 days prior to the equipment coming on site.
- E. All subcontractors shall meet the requirements of PPPL Policy P-072.

Chapter 7 Procurement

MCR-ES-MECH-011,R2-003

**8.3 CHECKLIST OF REQUIREMENTS FOR PROCURED SPECIAL PURPOSE
EQUIPMENT SERVICES**

Note: Failure to abide by the suggested advance notice
may result in disallowance of the equipment onsite.

Contract Number: _____

Work Planning Number: _____

PPPL Technical Representative: _____

Subcontractor contact Person: _____

Phone: _____ FAX: _____

1 Week in advance

Pre-job onsite discussion (>1 week in advance): _____

Site underground survey performed: _____

Reason for Dig: _____

Dig Plan Provided: _____

Special (e.g. Electrical) considerations: _____

Width: _____ Depth: _____ Length: _____

Contact One Call Site, <http://www.nj1-call.org/>, 1-800-272-1000 or 811.**3 Days in advance**

Equipment Make and Model: _____

Owner: _____

Current Periodic Inspection (copy provided) Date: _____

Operator: _____

Certification Dates: _____

Qualified Signal Persons: _____

JHA reviewed by Industrial Hygiene: _____

NJ License Expiration Date: _____

If Applicable:

OSHA § 1926.1400 Form Provided

Qualified Rigger(s): _____

Rigging supplied by: _____

Fax to Mike Viola (609) 243 3091

Chapter 7 Procurement

MCR-ES-MECH-011,R2-003

8.4 SPILL PREVENTION (SPCC) REQUIREMENTS

The U.S. EPA Spill Prevention Control and Countermeasure (SPCC) regulations (40 CFR 112) apply to activities at PPPL and the Lab has developed a facility-specific SPCC Plan to address these regulatory requirements. Both PPPL and subcontractor personnel using oils and fuels must comply with applicable requirements. Activities subject to SPCC regulations include, but are not limited to: fuel or oil deliveries, vehicle and equipment refueling using containers 55 gallons or greater, storage and operation of mobile refuelers, transformer draining/filling, and storage or use of oil or fuel in operating equipment (electrical equipment, heavy/mobile equipment, mobile generators, etc.). The RLM and PTR are responsible for incorporating these requirements into applicable SOWs, Specifications, etc. and for ensuring subcontractor compliance with these requirements.

Therefore, the following spill control measures are to be implemented:

When using containers less than 55 gallons:

- A. The refueling of small engines from portable fuel cans (e.g., 5-gallon gasoline containers) is not subject to SPCC regulations. Refueling should be conducted on impervious surfaces. Any spilled fuel must be reported immediately by calling (609) 243-3333
- B. Safety Requirements for fueling:
 - i. No smoking, open flames, sparks or electric arcs are permitted in any fueling areas.
 - ii. Fueling shall not take place while the engine is running.
 - iii. There shall be no one on the equipment during refueling procedures.
 - iv. Spilled fuel on equipment must be cleaned prior to equipment returning to service.

When using containers greater than 55 gallons:

- A. Whenever practical, oil transfer and refueling operations should be conducted on impervious surfaces (concrete or asphalt paving) within the area of the site that drains to the detention basin (see Attachment 1).
- B. Whenever practical, oil and fuel delivery and bulk transfers should be conducted within one of two designated fuel delivery containment areas, located adjacent to the Facilities Building or at the fleet refueling station (see Attachment 1).
- C. If the oil transfer must take place outside the area of the site that drains to the detention basin (see Attachment 1) or on a pervious surface, temporary secondary containment (drip pans, portable dikes, sorbent booms or pads) must be provided. If these temporary methods are chosen, the operator must ensure that sufficient containment volume and/or sorbent materials are readily available based on the quantity of oil, proximity of drains, etc. Subcontractors are responsible for providing suitable secondary containment for their operations.
- D. Mobile and portable oil/fuel containers with a capacity of 55 gallons or more (e.g., drums, tankers and pony trailers) may only be stored within the area of the site that drains to the detention basin (see Attachment 1) unless specific secondary containment is provided for the container.

PRINCETON PLASMA PHYSICS LABORATORY	ENGINEERING STANDARD	ES-MECH-011 Rev. 2 Page 9 of 9
Chapter 7 Procurement		

MCR-ES-MECH-011,R2-003

- E. Oil/fuel transfer operations must be monitored in-person by the operator, who must respond immediately to spills and leaks.
- F. Questions about spill prevention or response requirements should be directed to the Environmental Services Division at x3380.
- G. Safety Requirements for fueling:
 - v. No smoking, open flames, sparks or electric arcs are permitted in any fueling areas.
 - vi. Fueling shall not take place while the engine is running.
 - vii. Supply tank should be bonded with fuel tank prior to refueling.
 - viii. There shall be no one on the equipment during refueling procedures.
 - ix. Fueling areas shall be well ventilated and shall be equipped with appropriate fire protection (may be a part of the fuel bowser).
 - x. Fueling vehicle must carry proper equipment for absorbing spilled fuel.
 - xi. Spilled fuel on equipment must be cleaned prior to equipment returning to service.
 - xii. Any spilled fuel must be reported immediately by calling x3333.

ATTACHMENTS

1. Storm Water Runoff Area Map

MCR-ES-MECH-011,R2-003

