

Training and Evaluation Outline Report

Status: Approved

05 Dec 2014

Effective Date: 06 Oct 2016

Task Number: 05-PLT-5727

Task Title: Install Underground Distribution Equipment

Distribution Restriction: Approved for public release; distribution is unlimited.

Destruction Notice: None

Foreign Disclosure: FD1 - This training product has been reviewed by the training developers in coordination with the Fort Leonard Wood, MSCoE foreign disclosure officer. This training product can be used to instruct international military students from all approved countries without restrictions.

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	ATP 5-19 (Change 001 09/08/2014 78 Pages)	RISK MANAGEMENT http://armypubs.army.mil/doctrine/DR_pubs/dr_a/pdf/atp5_19.pdf	Yes	No
	NESCR®	National Electrical Safety Code. 2012 Edition	Yes	No
	NETA?	Maintenance Testing Specifications for Electrical Power Distribution Equipment & Systems. 2007	Yes	No
	NFPA 70	National Electrical Code	Yes	No
	NFPA 70E	Standard for Electrical Safety Requirements for Employee Workplaces. 2004	Yes	No
	TM 3-34.45	ENGINEER PRIME POWER OPERATIONS	Yes	No
	TM 5-302-4	ARMY FACILITIES COMPONENTS SYSTEM: DESIGN (S&I, USAEDH, ATTN: HNDED-FD, HUNTSVILLE, AL 35807-4301)	Yes	No
	TM 5-302-5	ARMY FACILITIES COMPONENTS SYSTEM: DESIGN (S&I, USAEDH, ATTN: HNDED-FD, HUNTSVILLE, AL 35807-4301)	Yes	Yes
	TM 5-682	Facilities Engineering: Electrical Facilities Safety.	Yes	No
	TM 5-704	Construction Print Reading in the Field. AFM 85-27.	Yes	No

Conditions: The element is directed to install an underground electrical power distribution system and ensure that a power line right-of-way is selected and prepared. The element is provided the following: electrical construction prints, applicable electrical distribution equipment as specified in the electrical construction prints, wiring diagrams, a line truck with a cable trailer, applicable digging or trenching equipment, a voltage detector, a lockout and tag-out kit, grounding equipment, safety Standing Operating Procedures (SOPs), the applicable manufacturer's literature, the Lineman's and Cableman's Handbook (LCH), the applicable Personal Protective Equipment (PPE), and DA Form 2702 (Bill of Materials (BOM)).

Note: The Commander must still determine at what level of training they would want the element to perform. Crawl, walk or run. This can only be determined after consideration as to the units training level.

The Commander prior to evaluating an element in the conduct of the task must determine if it will be conducted in a Live, Virtual, or Constructive environment, additionally it must also be determined which condition as described below that the element will conduct the task. The selection made for this task is at a trained level of proficiency. The commander must determine which of the environments below will best suit the unit and the proficiency level at which the unit is. When conducting crawl or walk level training units should not increase the intensity until the unit has achieved the standards and then unit trainers should include variables that increase proficiency in all conditions.

Note: The condition statement for this task is written assuming the highest training conditions reflected on the Task Proficiency matrix required for the evaluated unit to receive a "fully trained" (T) rating.

Note: Condition terms definitions:

Dynamic Operational Environment: Three or more operational and two or more mission variables change during the execution of the assessed task. Operational variables and threat Tactics, Techniques, and Procedures (TTPs) for assigned counter-tasks change in response to the execution of Blue Forces (BLUFOR) tasks.

Complex Operational Environment: Changes to four or more operational variables impact the chosen friendly COA/mission. Brigade and higher units

require all eight operational variables of Political, Military, Economic, Social, Infrastructure, Information, Physical environment, and Time (PMESII-PT) to be replicated in varying degrees based on the task being trained.

Single threat: Regular, irregular, criminal or terrorist forces are present.

Hybrid threat: Diverse and dynamic combination of regular forces, irregular forces, and/or criminal elements all unified to achieve mutually benefiting effects.

This task should not be trained in MOPP 4.

Standards: The element installs the distribution system according to the system design criteria and the procedures approved for installing underground distribution systems and equipment.

Note: Leaders are defined as the Commander, Executive Officer, First Sergeant, Operations Sergeant, Platoon Leaders, Platoon Sergeants, Squad Leaders, and Team Leaders.

Live Fire Required: No

Objective Task Evaluation Criteria Matrix:

Plan and Prepare		Execute					Assess	
Operational Environment	Training Environment (LW/C)	Training/Authorized % of Leaders Present at	% of Soldiers Present at	External Eval	% Performance Measures 'GO'	% Critical Performance Measures 'GO'	% Leader Performance Measures 'GO'	Task Assessment
SQD & PLT								
Dynamic (Single Threat)	IAW unit CATS statement.	>=85%	>=80%	Yes	80-90%	All	80-89%	T
		75-84%						T-
Static (Single Threat)		65-74%	75-79%	No	65-79%	<All	<=79%	P
		60-64%	60-74%		P-			
		<=59%	<=59%		U			

Remarks: None

Notes: All required references and technical manuals will be provided by the local command.

Safety Risk: Medium

Task Statements

Cue: None

DANGER

1. THIS TASK SHOULD ONLY BE PERFORMED BY QUALIFIED PERSONNEL KNOWLEDGEABLE IN THE INSTALLATION AND MAINTENANCE OF ELECTRICAL DISTRIBUTION SYSTEMS AND POWER EQUIPMENT AND THE ASSOCIATED HAZARDS. FAILURE TO COMPLY MAY CAUSE PERMANENT INJURY OR DEATH.

2. A VOLTAGE DETECTOR SHOULD BE USED TO ENSURE THAT CABLES ARE NOT ENERGIZED. MATERIAL (SUCH AS A LEAD SHEATH THAT ACTS AS A SHIELD) MUST NOT BE BETWEEN THE VOLTAGE DETECTOR AND THE CONDUCTORS OF THE CIRCUIT BEING TESTED. FAILURE TO TEST CABLES MAY CAUSE PERMANENT INJURY OR DEATH.

3. NEVER POSITION YOURSELF UNDER A SUSPENDED LOAD. FAILURE TO COMPLY MAY CAUSE OR PERMANENT INJURY OR DEATH.

4. REMOVE RINGS, NECKLACES, OTHER JEWELRY, AND LOOSE CLOTHING. FAILURE TO COMPLY MAY CAUSE PERMANENT INJURY OR DEATH.

Leaders have an inherent responsibility to conduct Risk Management to ensure the safety of all Soldiers and promote mission accomplishment.

WARNING

Risk management is the Army's primary decision-making process to identify hazards, reduce risk, and prevent both accidental and tactical loss. All Soldiers have the responsibility to learn and understand the risks associated with this task.

CAUTION

Identifying hazards and controlling risks across the full spectrum of Army functions, operations and activities is the responsibility of all Soldiers.

Performance Steps and Measures

NOTE: Assess task proficiency using the task evaluation criteria matrix.

NOTE: Asterisks (*) indicate leader steps; plus signs (+) indicate critical steps.

STEP/MEASURE	GO	NO-GO	N/A
+* 1. The element leader performs construction management functions.			
+ a. Verifies the project BOM.			
+ b. Prepares the project Critical Path Method (CPM) diagram.			
+ c. Ensures that construction materials are available.			
+ d. Assembles work crew(s) and assigns responsibilities.			
+ e. Coordinates requirements for nonorganic construction support.			
+* 2. The element leader develops and implements a work site safety plan.			
+ a. Produces a risk assessment matrix.			
+ b. Appoints a safety Non-Commissioned Officer (NCO).			
+* 3. The power plant operations supervisor conducts a work project safety briefing, addressing the following:			
+ a. Safety equipment and clothing.			
+ b. Ground guides for vehicles and materials handling equipment.			
+ c. Hand and arm signals to communicate boom, hook, or fork movement for the materials handling equipment.			
4. The element inspects serviceability of the following:			
a. Individual safety and PPE.			
b. Cable pulling equipment.			
+ 5. The element verifies the right-of-way selection and prepares to install the system.			
+ a. Verifies ducts and/or cable trenches are installed to specification.			
+ b. Verifies manholes and/or splice boxes are installed to specification.			
+ c. Ensures there is no water in manholes.			
+ 6. The element crew installs an underground distribution system.			
a. Hauls and stages the system construction materials.			
+ b. Excavates foreign matter and obstructions from conduits, cable trenches, manholes, and/or splice boxes.			
+ c. Installs cable into the conduit, which includes—			
(1) Setting up and operating the cable-pulling equipment.			
(2) Rigging and pulling the cable into the conduit.			
+ d. Installs the cable in an open trench, which includes—			
(1) Setting up and operating the cable-laying equipment.			
(2) Laying cable into the trench.			
+ e. Splices and terminates the cable.			
+ f. Performs a cable continuity test.			
+ g. Performs a cable after-installation, insulation resistance test.			
+ h. Installs and services the system electrical equipment.			
+ 7. The element performs distribution system after-installation inspection and testing, verifying the following:			
+ a. Serviceability of cable splices and terminations.			
+ b. Phase sequencing of the system cables.			
+ c. Setup and servicing of the system electrical equipment.			
+ d. System equipment grounding.			
+ e. Continuity testing of the phase cables.			
+ f. Insulation resistance test on all cables.			
+ 8. The element updates the system documentation, including:			
+ a. Modifications to the system design criteria and specifications.			
+ b. Prints and diagrams with as-built information and data.			
+* 9. The element leader prepares an After Action Report (AAR) and conducts a task completion briefing.			
+* 10. The element leader submits status reports to higher Headquarters (HQ) In Accordance With (IAW) unit SOP.			

TASK PERFORMANCE / EVALUATION SUMMARY BLOCK							
ITERATION	1	2	3	4	5	M	TOTAL
TOTAL PERFORMANCE MEASURES EVALUATED							
TOTAL PERFORMANCE MEASURES GO							
TRAINING STATUS GO/NO-GO							

ITERATION: 1 2 3 4 5 M

COMMANDER/LEADER ASSESSMENT: T P U

Mission(s) supported: None

MOPP 4: Never

MOPP 4 Statement: None

NVG: Never

NVG Statement: None

Prerequisite Collective Task(s):

Step Number	Task Number	Title	Proponent	Status
	05-CO-5750	Provide Prime Power Support	05 - Engineers (Collective)	Approved

Supporting Collective Task(s):

Step Number	Task Number	Title	Proponent	Status
	05-CO-5001	Perform Project Management	05 - Engineers (Collective)	Approved
	71-CO-5100	Conduct Troop Leading Procedures for Companies	71 - Combined Arms (Collective)	Approved
1.	05-CO-5250	Perform Construction Operations	05 - Engineers (Collective)	Approved
10.	05-CO-0018	Conduct Report Procedures	05 - Engineers (Collective)	Approved

OPFOR Task(s):

Task Number	Title	Status
71-CO-8502	OPFOR Execute an Ambush	Approved
71-CO-9004	OPFOR Reconnaissance Attack (Company and below)	Approved

Supporting Individual Task(s):

Step Number	Task Number	Title	Proponent	Status
	052-204-1108	Inspect Safety Equipment	052 - Engineer (Individual)	Approved
	052-204-1113	Prepare a Manhole for Safe Entry	052 - Engineer (Individual)	Approved
	052-204-1115	Rescue an Injured Victim From a Manhole	052 - Engineer (Individual)	Approved
	052-204-1117	Inspect Hot-Line Equipment	052 - Engineer (Individual)	Approved
	052-204-1119	Perform Operator Preventive-Maintenance Checks and Services (PMCS) on a Line Truck With Auxiliary Equipment	052 - Engineer (Individual)	Approved
	052-204-1120	Install a Grounding Set	052 - Engineer (Individual)	Approved
	052-204-1122	Install Distribution Equipment (De-energized)	052 - Engineer (Individual)	Approved
	052-204-1125	Operate a Line Truck with Auxiliary Equipment	052 - Engineer (Individual)	Approved
	052-204-1202	Maintain Rigging/Hoisting Equipment	052 - Engineer (Individual)	Approved
	052-204-1204	Tie Rope Knots and Splices	052 - Engineer (Individual)	Approved
	052-204-1205	Install Underground Cable	052 - Engineer (Individual)	Approved
	052-204-1213	Splice a Medium-Voltage URD Power Cable	052 - Engineer (Individual)	Approved
	052-204-1214	Terminate a Medium-Voltage URD Power Cable	052 - Engineer (Individual)	Approved
	052-204-2207	Conduct a Safety Briefing	052 - Engineer (Individual)	Approved
	052-204-2208	Conduct a Safety Inspection	052 - Engineer (Individual)	Approved
	052-204-2209	Install Distribution Equipment (Energized)	052 - Engineer (Individual)	Approved
	052-204-2211	Develop a Bill of Materials (BOM) List	052 - Engineer (Individual)	Approved
	052-204-2212	Energize an Electrical Distribution System	052 - Engineer (Individual)	Approved
	052-204-2213	Locate an Underground Cable and/or Fault	052 - Engineer (Individual)	Approved
	052-204-2216	Perform Maintenance on Electrical Distribution Equipment	052 - Engineer (Individual)	Approved
	052-204-2217	Manage a Power Line Crew	052 - Engineer (Individual)	Approved
	052-204-2218	Supervise the Installation of Underground Cable	052 - Engineer (Individual)	Approved
	052-204-2301	Perform Switching, Blocking and Tagging Procedures	052 - Engineer (Individual)	Approved
	052-204-2302	Install Distribution System Protection and Equipment (Energized)	052 - Engineer (Individual)	Approved
	052-204-2303	Perform Primary Voltage Live-Line Testing	052 - Engineer (Individual)	Approved
	052-204-2304	Perform Secondary Voltage Live-Line Testing	052 - Engineer (Individual)	Approved
	052-204-2305	Trouble Shoot Primary/Secondary Voltage Systems	052 - Engineer (Individual)	Approved
	052-204-2309	Design Underground Electrical Distribution System	052 - Engineer (Individual)	Approved
	052-206-2136	Perform an Insulation Resistance Test	052 - Engineer (Individual)	Approved
	052-206-3101	Produce an Electrical Schematic	052 - Engineer (Individual)	Approved
	052-207-2126	Produce an Electronic Schematic	052 - Engineer (Individual)	Approved
	052-210-1105	Manage the Installation of Distribution Equipment	052 - Engineer (Individual)	Approved
	052-210-1106	Perform Quality Assurance (QA) Quality Control (QC)	052 - Engineer (Individual)	Approved
	052-210-1117	Design a Temporary Medium Voltage Distribution System	052 - Engineer (Individual)	Approved
	052-210-1144	Manage Disaster Relief Operations	052 - Engineer (Individual)	Approved
	052-239-3001	Prepare a Bill of Materials	052 - Engineer (Individual)	Approved
	052-244-2102	Splice a Medium-Voltage Power Cable	052 - Engineer (Individual)	Approved
	052-244-2103	Terminate a Medium-Voltage Power Cable	052 - Engineer (Individual)	Approved
	052-244-2112	Perform Lockout and Tagout Procedures	052 - Engineer (Individual)	Approved
	052-244-2144	Read a Schematic	052 - Engineer (Individual)	Approved
	052-244-3113	Supervise the Maintenance of Distribution Equipment	052 - Engineer (Individual)	Approved
	052-244-3114	Supervise an Automatic Transfer Switch (ATS) Service	052 - Engineer (Individual)	Approved
	052-244-3115	Design an Underground Electrical Distribution System	052 - Engineer (Individual)	Approved
	052-244-4205	Perform Electrical Project Management	052 - Engineer (Individual)	Approved
	052-244-4206	Perform Quality Assurance (QA) and/or Quality Control (QC) Responsibilities	052 - Engineer (Individual)	Approved
	052-244-4209	Perform Quality Assurance (QA) and/or Quality Control (QC) Duties	052 - Engineer (Individual)	Approved
	052-244-4210	Supervise a Power Plant Installation	052 - Engineer (Individual)	Approved
	052-244-4211	Conduct Contract Officer's Technical Representative (COTR) Operations	052 - Engineer (Individual)	Approved

Supporting Drill(s): None

Supported AUTL/UJTL Task(s):

Task ID	Title
ART 4.1.7	Provide General Engineering Support
ART 4.0	The Sustainment Warfighting Function

TADSS

TADSS ID	Title	Product Type	Quantity
No TADSS specified			

Equipment (LIN)

LIN	Nomenclature	Qty
No equipment specified		

Materiel Items (NSN)

NSN	LIN	Title	Qty
No materiel items specified			

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to the current Environmental Considerations manual and the current GTA Environmental-related Risk Assessment card. .

Safety: In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination. .