



## 4.1 Designing and Installing Exterior Vapor Distribution Systems Performance-Based Skills Assessment 2019



### **Section One**

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Task 6

### **Design Vapor Distribution Systems: Containers and Lines**

Determine Effective System Load  
Identify Factors Affecting Selection of a Properly Sized Container  
Select the Appropriate Container  
Establish Container Location  
Select and Size Pipe and Tubing  
Identify Corrosion and Prevention Methods

### **Section Two**

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Task 2

### **Design Vapor Distribution Systems: Regulators and Meters**

Size and Select Regulators  
Identify Operations of Vapor Meters

### **Section Three**

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### **Prepare System Components for Transport**

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Prepare for Container Transport  
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### **Section Four**

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### **Install Containers**

Perform Pre-Installation Activities  
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### **Section Five**

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Install Vapor Delivery Lines: Copper  
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### **Section Six**

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### **Install Regulators and Meters**

Install Regulators  
Install Vapor Meters

### **Section Seven**

Task 1  
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### **Container to Container Transfers and Systems Tests**

Identify Equipment for Container to Container Transfers  
Perform Container to Container Transfers  
Verify System Tests  
Explain Company Policies and Procedures Related to an Uncontrolled Release of Propane

**NOTICE:** The Skills Evaluator must be the candidate's supervisor or another qualified person who has completed 4.1 "Designing and Installing Exterior Vapor Distribution Systems" or is familiar with the subject matter.

**CETP Certification requires that the employee seeking certification cannot act as his/her own evaluator.**

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National Propane Gas Association 2019

## **Instructions for Use:**

The Performance Based Skill Assessment Evaluation is designed to standardize conditions under which the candidate demonstrates performance of tasks to meet the requirements for NPGA CETP Certification.

The Skills Assessment should be supplemented with company policies and procedures related to each task being evaluated as needed.

2. The candidate has 12 months from the date of successfully passing the CETP Certification exam to train and successfully complete the tasks within the evaluation.
3. The affidavits and a final checklist are provided on the last two pages of the skills packet.
  - Affidavits must be signed by both the candidate and the skill evaluator
  - The final checklist must be fully completed within 12 months of passing the exam (Candidates may use this time to practice skills as often as necessary)
  - Make a copy for the training records when the skills assessment is completed for future audits
  - Send the affidavit page and final checklist (last two pages) to the testing center within 12 months of passing the exam
4. All requirements and prerequisites must be met before certification will be granted.

### **4.1 Certification Requirements**

- Passing exam score on 4.1 “*Designing and Installing Exterior Vapor Distribution Systems*” exam
- Completed and signed 4.1 “*Designing and Installing Exterior Vapor Distribution Systems*” Skills Assessment Affidavit and Final Checklist returned to the testing center within 12 months of passing the exam.
- 1.0 *Basic Principles and Practices* certification completed within 12 months of passing the exam

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### **NPGA 4.1 Designing and Installing Exterior VDS Skills Assessment (2019)**

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**04192016**

## **Instructions for Candidate:**

Practice the operations as many times as needed to become confident and proficient with the documents or equipment necessary to complete each task. Your evaluator will check and observe your performance, using the steps to complete each hands-on operation and/or company procedures.

The candidate must adhere to all safety precautions. If a safety precaution is violated, then the demonstration shall be stopped and the skills evaluator must instruct the candidate on the proper safety procedures that apply before allowing the candidate to continue.

After completing the skills evaluation, the candidate must fill out the Employee Information section and sign the Affidavit.

**Required information includes the candidate's last four digits of the SSN to assist the testing center in locating the correct records.**

## **Instructions to the Skills Evaluator:**

The candidate must adhere to all safety precautions. If a safety precaution is violated, then the demonstration shall be stopped and the skills evaluator must instruct the candidate on the proper safety procedures that apply before allowing the candidate to continue.

- Review the tasks within the Skills Evaluation with the candidate.
- Review all of the instructions, answering any questions and explaining how the skills assessment will be used.
- Demonstrate and/or talk the candidate through each of the steps required to perform each task.
- Allow the candidate time to ask questions and/or study the steps.
- Observe the candidate performing the required steps, providing corrections as needed
- Allow the candidate to practice until he/she is confident. *Remember:* the candidate has 12 months from the date of passing the exam to complete and return the skills assessment
- Evaluate the candidate when ready
- After completing the final checklist, complete the Skills Evaluator information and sign the affidavit.
- Ensure that the Affidavit and final Checklist are copied for the Employee Training Records and then sent to the testing center.

Each task is divided into one or more operations upon which the candidate's performance is evaluated. All tasks must be completed unless the "Not Applicable" option is both available for the task and applicable to the candidate or the marketer's present situation.

**Satisfactory** - When all the operations within a task are successfully performed by the candidate according to the criteria provided, the evaluator will check off the box marked "Satisfactory."

\* **Not Applicable** - Certain tasks have the "Not Applicable" option available. The Skills Evaluator must ensure the circumstances described under the option are applicable to either the candidate or marketer's present situation.

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## Section One: Design Vapor Distribution Systems: Containers and Lines

### Task 1: Determine Effective System Load

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and use company-designated forms for the skills assessment task evaluation:*

1. Determine the Btu/hr input ratings for all appliances currently served by the propane system and any additional appliances that may be added in the future.
2. Determine the Effective System Load, or actual load, according to company policies and procedures.
3. Explain the differences between Total Gas Demand and Effective System Load and the purpose of each calculation.

**Satisfactory**

### Task 2: Identify Factors Affecting Selection of a Properly Sized Container

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain how the following affect vaporization rate:
  - Wetted surface area of the container
  - Liquid level in the container
  - Temperature and humidity surrounding the container
  - Aboveground vs underground installations
2. Demonstrate the ability to correctly size a container using a vaporization chart or “rule of thumb” method for the following:
  - Aboveground Containers - Horizontal
  - Aboveground Containers – Vertical
  - Underground Tanks
  - Mounded Underground Tanks
3. Explain any additional factors affecting the selection and sizing of containers, to include:
  - AHJ – Authority Having Jurisdiction
  - Geographical area and flood zones
  - Company Policies and Procedures
  - Underground Utilities and terrain conditions
  - Customer and/or Marketer Considerations
  - Temperature, humidity, and presence or absence, density and depth of snow cover

**Satisfactory**

### Task 3: Select the Appropriate Container

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify the propane capacity ranges for the following containers used in residential or commercial installations:
  - DOT Exchange Cylinders
  - Manifolded containers
  - DOT Stationary Cylinders
  - ASME Tanks
2. Select the appropriate container using a vaporization chart for the following scenario:
  - Effective system load: 500,000 Btu/hr
  - Lowest Operating Temperature: 15 degrees
  - Frost penetration depth: 10”
  - Customer preference: Aboveground

**Satisfactory**

### Task 4: Establish Container Location

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify NFPA 58 code spacing, location and minimum distance requirements for the following containers filled on site:
  - DOT Cylinders
  - Underground ASME Tanks
  - Aboveground ASME Tanks
  - Multiple Tanks

**Continued**

**Task 4 continued**

2. Explain how each of the following impact the planning for locating containers:
  - Access for delivery:** explain how the delivery truck and hose(s) must be considered for containers filled on-site
  - Type of container:** explain how the type, size and requalification needs of a container can affect its location
  - Underground utilities:** explain how the verification and proper marking of utilities can affect the container location
  - Special Geographical Considerations:** explain how flood zones, bodies of water, maximum snow depth, and other special geographical considerations affect the container location
  - Customer Preferences:** explain why a customer requested location for a container should be considered, but may not always be possible to fulfill
3. Explain procedures for the verification of underground utilities.
4. Identify any additional local code or safety and distance requirements or restrictions for locating containers.

**Satisfactory**

**Task 5: Size and Select Pipe and Tubing**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and use copies of NFPA 58 and manufacturer information for the skills assessment task evaluation:*

1. Identify the defining characteristics, service applications and connection mechanisms of the four basic pipe and tubing materials:
  - Steel and Wrought Iron
  - Corrugated Stainless Steel Tubing (CSST)
  - Polyethylene (PE)
  - Copper
2. Identify the limitations and special considerations of the four basic pipe and tubing materials:
  - Steel and Wrought Iron
  - Corrugated Stainless Steel Tubing (CSST)
  - Polyethylene (PE)
  - Copper
3. Explain the term "size the line."
4. Size the line between the first and second stage regulators following company policies and procedures, to include:
  - Select the pipe or tubing material to be used between the first and second stage regulators
  - Measure the appropriate length of line required from the outlet of the 1<sup>st</sup> stage regulator to inlet of the 2<sup>nd</sup> stage regulator
  - Calculate the total gas demand for the appliances that will be served by this line, to include anticipated future demand
  - Select appropriate Sizing Table in NFPA 58 for the type of pipe or tubing material selected
  - Use the pipe or tubing table to determine the appropriate line size
5. Explain NFPA 58 requirements and any local requirements for installing metal pipe or tubing materials underground.
6. Explain how to size pipe and tubing for multiple second stage regulators, to include:
  - Location of the first stage regulator
  - Line size calculations throughout the piping system
  - NFPA 58 Requirements for Sizing Multiple Stage Regulator

**Satisfactory**

**Task 6: Identify Corrosion and Prevention Methods**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify the types of corrosion below by providing examples of its effects on propane containers and vapor distribution systems:
  - Atmospheric corrosion
  - Soil corrosion
  - General (uniform corrosion)
  - Galvanic corrosion for Underground Systems
  - Crevice corrosion
  - Pitting
2. Explain how the following are used in corrosion prevention:
  - Paints and protective coatings
  - Cathodic Protection Systems
  - Electrically insulating fittings and dielectric unions

**Satisfactory**

## Section Two: Design Vapor Distribution Systems: Regulators and Meters

### Task 1: Size and Select Regulators

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain the purpose and basic operation of regulators.
2. Identify the following components of the regulator and explain their function:
  - Lower body
  - Upper spring case
  - Orifice and plunger seat disc assembly
  - Seat disc
  - Diaphragm
  - Main spring
  - Internal relief valve
  - Vent
3. Explain what each of the following regulators are designed for and when they are used in a propane vapor distribution system:
  - Single-stage regulators
  - First-stage regulators
  - Second-stage regulators
  - High-pressure regulators
  - Integral 2-stage regulators
  - Automatic changeover regulators
  - Line pressure regulators
  - Integral 2-psi service regulators
4. Explain the causes of regulator freeze-up and identify measures for prevention caused by:
  - Vent blockage from external ice
  - Moisture laden propane vapor
  - Accumulated moisture freezing in the upper spring case
  - Accumulated moisture freezing in a pigtail
5. Explain the purpose of regulator relief valve overpressure protection and any related company policies and procedures
6. Explain how the following are used in selecting a first stage regulator:
  - Inlet pressure
  - Total gas demand
  - Outlet pressure
  - Manufacturer Regulator Selection Chart
7. Demonstrate how to use regulator performance curves.
8. Explain how the following are used in selecting a second stage regulator:
  - Piping layout
  - Special requirements
  - Appliance demand
  - Manufacturer Regulator Selection Chart
9. Explain when to use a 2 psi regulator within the system for the following:
  - High demand of appliances
  - High flow rate

**Satisfactory**

### Task 2: Identify Operations of Vapor Meters

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Explain where a typical vapor meter is connected in the distribution system and how it operates to monitor the flow of propane.
2. Explain why the following conversion factors are used for a vapor meter in propane service and demonstrate how to correctly use them:
  - $CFH \times 2,500 \text{ Btu/CF} = \text{Btu/hr}$
  - $\text{Natural Gas CFH} \times F_g = \text{Propane CFH}$
3. Explain how the following pressure factors affect the operation of a vapor meter:
  - Measurement factors when inlet pressure is above 11" w.c.
  - Measurement factors when inlet pressure is below 11" w.c.
  - Maximum pressure drops for ½ lb. systems
  - Maximum pressure drops for 2-psi systems
4. Explain how the following factors affect the sizing of a vapor meter:
  - Total gas demand
  - Normal operating temperature for the installation location
  - Elevation and pressure where the meter is installed

**Continued**

### Task 2 continued

5. Identify the operating characteristics of the following types of meter indexes, and the installations they are typically used for:
- Direct indexes
  - Circular indexes
  - Observation indexes

**Satisfactory**                      \* **Not Applicable**

*\*Not Applicable means that the person's job description does not require the person to perform this task, **OR** the company does not size or select vapor meters.*

## Section Three: Prepare System Components for Transport

### Task 1: Verify Container Condition

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Inspect the condition of a DOT cylinder to determine its fitness prior to loading for transport according to company policies and procedures, as applicable:
  - Check the cylinder's manufacturing date and requalification date
  - Visually inspect the overall fitness of the cylinder by checking for any obvious defects
  - Determine if any conditions are present to qualify cylinder as "rejected" or "condemned," and designate as appropriate
  - Verify there is no damage or any leaks at the pressure relief valve, or any other valve or fitting
  - Verify the condition of the service handwheel, stem, and all gauges
  - Verify the cylinder valve(s) are properly protected by a cap, collar, or neck ring as appropriate
  - Verify all required DOT cylinder markings are readable and proper for propane service
  - Verify the cylinder is properly labeled with a DOT shipping label, consumer safety information and/or OSHA warning label, as appropriate
2. Inspect the condition of an ASME tank to determine its fitness prior to loading for transport according to company policies and procedures:
  - Verify the amount of propane in the tank
  - Check the condition of the tank protective coating and repair as appropriate
  - Check the condition of all valves and fittings
  - Ensure all valve rain caps are in place and the metal plug or cap is in place and sealed on the liquid withdrawal valve
  - Check the tank's lifting lugs and supports to ensure they are intact, firmly attached, and free of defects
  - Verify the data plate markings or certification stampings are legible and the tank is properly marked and labeled for transport
3. Perform a leak test on either a DOT cylinder or an ASME tank according to company policies and procedures.

**Satisfactory**

### Task 2: Prepare for Container Transport

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and observe safety precautions for the skills assessment task evaluation:*

1. Explain DOT requirements for transporting ASME tanks filled with propane under the following conditions:
  - ASME Tanks filled to 5% of their water capacity or less
  - ASME Tanks with water capacities 126 to 500 G.W.C filled to more than 5%
2. Explain the DOT labeling requirements for transporting the following:
  - ASME Tanks with water capacities between 125 and 999 gallons
  - ASME Tanks with water capacities between 1,000 and 5,000 gallons
  - DOT Cylinders containing propane
3. Identify the following DOT requirements for Vehicle Documentation:
  - Shipping papers             Hazmat Certificate of Registration     Emergency Response Information
4. Visually inspect the vehicle's approved fire extinguisher for proper size and rating.

**Satisfactory**



## Task 3: Load Containers for Transport and Installation

**Evaluator: Indicate the loading method used:**     Truck-Mounted Crane     Tank Setting Trailer     Both (Optional)

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and observe safety precautions, federal requirements and manufacturer instructions for the skills assessment task evaluation:*

### Load DOT Cylinders, if applicable

1. Demonstrate proper use of a lift gate, if available, according to company policies and procedures and manufacturer instructions.
2. Properly load and secure a cylinder according to company policies and procedures and manufacturer instructions, to include:
  - Position cylinder on the bed of the vehicle so that the weight is evenly distributed, and then secure the load, ensuring that cylinder's pressure relief valve is in direct communication with the vapor space at all times.
  - Verify the cylinders are secured by chains and chain binders or cargo straps and binder so they cannot shift, fall, or be ejected from the vehicle

### Load Tanks: Truck-Mounted Cranes, if applicable

1. Explain who DOT would consider to be a "designated person" to operate a truck-mounted crane.
2. Properly load and secure an ASME tank using a truck-mounted crane according to company policies and procedures and manufacturer instructions, to include:
  - Discuss the pre-planning safety precautions and loading procedures for all loading personnel involved
  - Identify the crane's maximum lifting capacity
  - Park the crane truck and set the parking brakes and wheel stops
  - Extend the outriggers, adjusting as necessary to level the crane structure, and lock them into position
  - Visually inspect the crane, to include:
    - a) *Lifting hook and swivel:* ensure they are not damaged and the safety latches are in place
    - b) *Locking pins or set screws to secure the hook and swivel:* ensure they are present
    - c) *Chains and hooks of the lifting bridle or slings:* ensure they are in good condition and have proper load ratings to handle the tank
  - Visually inspect slings in accordance with their intended use to ensure their effectiveness
  - Properly arrange and attach sling(s) with adequate load rating and determine the path of the tank lift and travel
  - Identify when not to use the container's lifting lugs.
  - Connect the lifting hook to sling or tank. Carefully lift the tank off of the ground and slowly rotate and position the tank so it can be lowered onto the truck bed.
  - Identify when to use cradles or saddles.
  - With the boom still connected to the sling, secure the tank to the truck bed with tie-down straps or chains to meet federal requirements
  - Remove all slings and guide ropes, and secure them to the truck
  - Return the crane to the original travel position and lock into place according to manufacturer instructions
3. Identify the necessary job tools and materials to assemble and explain how materials of trade are required to be stored

### Load Tanks: Tank Setting Trailers, if applicable

1. Prior to loading, inspect the tank setting trailer according to company policies and procedures to include the following:

<input type="checkbox"/> Hydraulic System	<input type="checkbox"/> Mounting Hardware
<input type="checkbox"/> Electrical System	<input type="checkbox"/> Lights
<input type="checkbox"/> Mechanical Components	<input type="checkbox"/> Reflectors
<input type="checkbox"/> Fluid Level in Brake Master Cylinder Reservoir	<input type="checkbox"/> Bunks
<input type="checkbox"/> Safety Breakaway Chain	<input type="checkbox"/> Rims and Tires
<input type="checkbox"/> Safety Chains	<input type="checkbox"/> Placard Holder
2. Perform a pre-trip inspection if towing on public roadways.
3. Properly load and secure an ASME tank according to manufacturer instructions, to include:
  - Remove the bunks or support cross-members
  - Position the trailer around the tank
  - Lift the tank high enough for all the bunks to be secured to the trailer frame
  - Install the bunks according to the trailer's manufacturer instructions and secure as directed. If lock pins are required, verify they are in place
  - Lower the tank onto the bunks
  - Use cargo straps or chains and binders to secure the tanks in at least two places
  - Conduct a walk-around inspection to verify the trailer is ready to be transported
4. Identify the necessary job tools and materials to assemble and explain how materials of trade are required to be stored.

**Satisfactory**

## Section Four: Install Containers

### Task 1: Perform Pre-Installation Activities

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Review the work order information with the customer to confirm the following:
  - Work order information is consistent with customer's request and needs
  - Verify there are no known or planned changes to the building or the property itself that could affect the container or regulator location
  - Verify with the customer that vehicular traffic will not be operating near the tank
  - Verify the total gas demand, to include any future planned appliance installations, to confirm equipment selection and sizing
2. Check the immediate area for any potential safety hazards to safely spot the delivery vehicle
3. Position the delivery vehicle on an appropriate site and surface, and set the parking brake and wheel stops
4. Perform an exterior site assessment for underground utilities according to company policies and procedures, documenting as necessary:
  - Confirm the locations of underground utilities and verify that the local one-call service has been contacted
  - Confirm and document the location of customer-owned underground systems
  - Ensure that the buried tank or piping will not interfere with pre-installed utilities or systems
5. Ensure the following site factors are addressed during exterior site assessment prior to installation, to include:
  - NFPA spacing requirements
  - Possible physical damage from vehicles
  - High water levels or flooding
  - Maximum snow depth
  - Damage to regulator from falling snow or ice
  - Access to bulk trucks and cylinder dollies

**Satisfactory**

### Task 2: Install Aboveground Containers

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

#### **DOT Cylinders**

1. Verify the cylinder location meets NFPA 58 distance requirements from property lines, buildings and combustibles, and ensure that identified utility lines do not interfere with planned cylinder and line locations.
2. Prepare the area to set the cylinder base and ensure it is level and firm.
3. Set and level the foundation, making adjustments to the grade as necessary to ensure the blocks and foundation are level.
4. Unload the cylinder and inspect the protective coating on the cylinder to ensure it was not damaged during transport.
5. Verify that all caps or plugs are installed in valves as appropriate
6. Install DOT Cylinder in upright position in the center of the foundation and ensure it is stable by verifying that it rests squarely and firmly on the foundation blocks.
7. Verify the cylinder, cylinder foot ring, and bottom head do not touch the soil near the foundation blocks so as to avoid the possibility of corrosion.
8. Assemble Multiple Cylinder Installations:
  - Explain the differences between automatic and manual changeover regulators used in multiple cylinder residential installations and how the systems switch from one container to another.
  - Demonstrate how to manifold an exchange system with an automatic changeover at a residential installation
  - Demonstrate how to manifold a multiple container system
  - Demonstrate how to properly select and use thread sealing compounds

#### **ASME Tanks**

1. Verify tank location meets NFPA 58 distance requirements for distance from property lines, overhead utility lines, important buildings, and combustibles. Check all utility markings to ensure they will not interfere with planned tank and line locations.
2. Prep the area to ensure tank is located on firm and level ground
3. Set and level the foundation, ensuring that the tank meets all clearance requirements.
4. Secure the tank if applicable to local code requirements

*Continued*

### **Task 2 continued**

5. Unload the tank according to truck or trailer setting company policies and procedures and manufacturer instructions, to include:

Using a truck with a crane, if applicable:

- Position the truck within the limits of the crane
- Follow codes for setting the emergency brake and using wheel stops prior to unloading tank
- Correctly set and lock the outriggers in place
- Use appropriate chains or slings to lift the tank

Or

Using a tank setting trailer, if applicable:

- Position the trailer carefully so the mounting feet of the tank are directly above the appropriate blocks
- Remove the tie down straps and load bunks from the trailer

6. Use the crane or trailer winch, as appropriate, to slowly lower the tank onto the foundation and inspect the tank protective coating for any damage during transport.
7. Disconnect and store any lifting slings, jacks and related accessories as appropriate.
8. Verify the tank is stable by ensuring each tank leg rests squarely and firmly on the foundation
9. Install barrier, markings and/or restraints as required
10. Manifolded ASME tanks:
- Ensure tanks are correctly set according to manifolded tank water capacity spacing requirements
  - Ensure the tank foundations are correctly set
  - Verify the tanks are stable by ensuring that each tank leg rests squarely and firmly on the foundation
  - Install support post to adequately support a regulator and necessary piping
  - Demonstrate how to manifold piping to connect the tanks to each other and to the regulator
11. Prepare the tank for service, to include:
- Remove any tape from gauge faces, dust caps, and chains
  - Install the rain cap on the relief valve
  - Attach any required warning or instruction decals to the container as required
  - Ensure any required dust caps are installed

**Satisfactory**

## **Task 3: Install Underground Containers**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the skills assessment task evaluation:*

1. Identify NFPA 58 requirements for installing underground ASME tanks.
2. Verify the tank location according to company policies and procedures, to include:
  - Confirm the local one-call service has been contacted and underground utilities are identified, as applicable
  - Confirm customer owned underground systems
  - Ensure tank location meets code requirements for distance from property lines, buildings, sources of ignition and vehicular traffic
  - Determine the stability of soil for tank location, ensuring appropriate distances from low lying areas where water may collect
3. Determine the proper size of the hole needed for the underground installation and excavate to the proper depth
4. Excavate the hole following OSHA requirements for sloping or shoring the walls
5. Prepare the excavation base for the underground ASME tank, ensuring it is level and adheres to local requirements
6. Install anodes as needed according to company policies and procedures, to include:
  - Prepare appropriate holes for the anodes
  - Prepare anodes according to manufacturer instructions, ensuring the anodes are wet and that the water soaks in
  - Unwind the wire from each anode and temporarily anchor the wire to the top of the excavation with a rock or clod or dirt, ensuring that the wiring does not come into contact with the tank.
  - Cover the anodes with dirt
7. Unload the tank according to vehicle manufacturer instructions, to include:
  - Position the vehicle to keep equipment and outriggers away from the edge of the excavation
  - If using a crane*, position the truck within the limits of the crane
  - Follow codes for setting the emergency brake and using wheel stops prior to unloading tank
  - Correctly set and lock the outriggers in place
  - Use appropriate chains or slings to lift the tank
  - Check the tank's protective coating prior to lowering it into the excavated hole
  - Lower the tank into the excavation
  - Seat the tank and then carefully attempt to rock it back and forth to ensure it is stable and level

**Continued**

### **NPGA 4.1 Designing and Installing Exterior VDS Skills Assessment (2019)**

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### Task 3 continued

- Disconnect and store any lifting slings, jacks and related accessories as appropriate
  - Return crane and outriggers to stored position for travel
8. Prepare the tank for service, to include:
- Install the pigtail, first-stage regulator, and regulator vent pipe-away as necessary
  - Install the buried distribution line connections and dialectic union, if applicable
  - Connect the buried distribution line to the regulator outlet and test for leakage, if applicable
  - Verify all anode wires are properly connected and secured
  - Inspect the container coating again for damage that may have occurred during installation, recoating any found damage
  - Verify the regulator vent or vent extension terminates above the anticipated water line and the regulator adjustment closure cap is tight
  - Verify all local requirements for securing the tank have been met, as applicable
9. Backfill the excavation, to include:
- Remove rocks and gravel from backfill soil prior to beginning backfill process
  - Use a shovel to backfill the area around the distribution line and anode wires
  - Backfill approximately 12" of dirt or sand all around the tank, and then tamp the dirt or sand
  - Fill the area around the dome to ensure the soil is graded down and away from the dome cover
  - Replace sod originally removed for excavation process
10. Explain manifolding multiple underground ASME tanks, to include
- Protecting the regulator from soil
  - Protecting the regulator from water

**Satisfactory**                      \* **Not Applicable**

*\*Not Applicable means that the person's job description does not require the person to perform this task, **OR** the company does not install underground ASME Tanks.*

## Task 4: Test, Troubleshoot and Retrofit Cathodic Protection Systems

*Preparation Guide: Wear appropriate Personal Protective equipment (PPE) for the skills assessment task evaluation:*

1. Test the cathodic protection system on a new underground tank installation, or within 180 days of installation in the event climatic conditions prohibit testing, according to company policies and procedures, to include:
- Verify the ground is moist to ensure electrical conductivity where readings are taken
  - Set the voltmeter to the 2-volt or 20-volt DC scale
  - Connect the voltmeter to the tank with the positive lead connected to the multivalve or anode wire and the negative lead connected to the copper sulfate electrode for a good metal-to-metal contact
2. Place the tip of the electrode into the moist ground above and to one side of the tank and document the data, to include:
- Explain the meaning of a voltage reading (-0.65 volts)
  - Explain the meaning of a voltage reading (-0.90 volts)
  - Repeat the process at the opposite site of the dome, and then at both ends of the tanks, recording each reading according to company policies
  - Make any necessary corrections to anode(s) and/or connections, and repeat the testing and correction process until all four readings are acceptable
3. Identify additional code requirements for testing and document the continued effectiveness of cathodic protection systems after the initial installation testing has been completed.
4. Explain troubleshooting a cathodic protection system
5. Explain what retrofitting a cathodic protection system is, and provide examples of situations when retrofitting may be required
6. Retrofit an existing tank, to include:
- Verify there are no propane service lines, low voltage overhead wires, sprinkler lines or other owner installations or landscape where you plan to dig
  - Cut out a plug of grass 5 feet from the side of the tank dome and set aside
  - Prepare a hole at least 3 feet deep or as necessary to accommodate the anode for the climate and surroundings
  - Place the anode in the hole and pour water over it.
  - Touch the anode wire to the multivalve while taking an initial reading. If within limits, proceed with installation. If not within limits, refer to troubleshooting guidelines before proceeding with installation.
  - Route anode wire under grass and into to the dome and make a proper, secure and watertight connection to the tank multivalve or riser pipe
  - Fill the anode hole with soil and replace grass plug.
  - Test the soil using the steps in #1 above.

**Satisfactory**                      \* **Not Applicable**

*\*Not Applicable means that the person's job description does not require the person to perform this task, **OR** the company does not install underground ASME Tanks.*

### NPGA 4.1 Designing and Installing Exterior VDS Skills Assessment (2019)

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## Section Five: Install Lines

### Task 1: Install Vapor Delivery Lines

**Evaluator: the following steps are to be completed for a 2-stage regulated vapor distribution system**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and follow manufacturer instructions for the skills assessment task evaluation:*

1. Identify NFPA 58 code requirements for installing pipe, tubing and fittings for all propane vapor distribution systems
2. Identify the types of acceptable materials for use in aboveground distribution lines and associated company policies for their support and protection against physical damage and exterior corrosion
3. Demonstrate how to install vapor underground lines using the following basic steps:
  - Dig the trench
  - Insert appropriate pipe or tubing in the trench
  - Plug or cap the lines
  - Pressure test and leak check the exterior installed line
  - Backfill the trench

**Satisfactory**

### Task 2: Install Vapor PE Distribution Lines

**Evaluator: the following steps are to be completed for a 2-stage regulated vapor distribution system**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and follow manufacturer instructions for the skills assessment task evaluation:*

1. Inspect polyethylene (PE) pipe or tubing prior to installing for underground service, to include:
  - Ensure PE pipe and tubing is clearly marked for propane service with ASTM D 2513
  - Carefully inspect for cuts, gouges, deep scratches, and other defects or damage
  - Inspect for damage by sunlight and UV light
2. Follow manufacturer-specific instructions and use specific tools to correctly join PE pipe and tubing with the following mechanical fittings:
  - Stab-type fitting
  - Barbed fitting
3. Install PE pipe according to manufacturer instructions, to include:
  - Install tracer wire or metallic tape if PE pipe is not encased in a gastight metal pipe
  - Where PE pipe is not buried at either the container or the 2<sup>nd</sup> stage regulator, ensure it is encased in an approved anodeless riser to protect from physical damage and exposure to sunlight
  - Lay the PE pipe and tubing, ensuring the piping is snaked to allow for changes in temperature
  - Ensure PE pipe and tubing is joined so that all connections are covered by dirt and not exposed in the dome of an underground tank (as applicable)
  - Ensure PE pipe is continuously supported and trench is free of rocks or other materials that may cause damage

**Satisfactory**

### Task 3: Install Vapor Delivery Lines: Copper

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and follow manufacturer instructions for the skills assessment task evaluation:*

1. Identify the approved use and defining characteristics for the following types of copper tubing commonly used for vapor distribution system installations:
  - Type L
  - Refrigeration or Air Conditioning and Refrigeration (ACR) tubing
  - Type K
2. Explain how copper tubing should be plugged or capped after cutting to maintain dryness and cleanliness.
3. Identify and assemble the following tools and materials needed to join copper tubing, using the flared fitting method:
  - Tubing cutter
  - Flare nuts, elbows, unions, and t-fittings
  - Male and female pipe thread connectors
  - Flaring tool
  - Reamer
  - Flare caps and plugs

**Continued**

**Task 3 continued**

4. Join the copper tubing by creating a flare connection, to include:
- Inspect the tubing area to be cut for damage and mark the correct spot for cutting
  - Ensure the wheel on tubing cutter is sharp and free of damage, replacing as necessary
  - Correctly use tubing cutter to make the cut without damaging the tubing
  - Remove any chips from outside and burrs from inside of tubing opening with reamer blade
  - Select and place appropriate flare nut on the tubing, inspecting it to ensure the threads are clean and placing it on the tubing with the female flared end facing the end of the tubing that was just cut.
  - Use a reamer to bevel the leading edge of the tubing
  - Place the cut end of the tubing in the properly-sized hole of the die block, allowing the end of the tubing to extend past the block according to manufacturer instructions
  - Form the flare according to manufacturer instructions, ensuring a correctly formed flare
  - Clean the flare nut threads on the flared end of the tubing and the threads on the flare fitting before assembling the flared tubing connection
  - Connect and tighten the flare nut onto the flare fitting by hand before using a wrench, ensuring not to screw the fittings into the flare nut.
  - Once the flare tubing connection is hand-tight, use two wrenches to tighten the connection, ensuring not to over tighten

**Satisfactory**

**Task 4: Install Vapor Delivery Lines: Metal and CSST**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and follow manufacturer instructions for the skills assessment task evaluation:*

1. Identify the three types of metal NFPA 58 specifies *that can be used* for propane vapor distribution systems
2. Identify and assemble the following tools and materials needed to cut and thread steel pipe:
  - Pipe vise
  - Pipe reamer
  - Nipples, elbows, tees, unions and couplings
  - Pipe cutter
  - Pipe threading tool
  - Caps and plugs
3. Demonstrate how to allow for pipe fittings using the following terms for measuring and cutting steel pipe:
  - Fitting allowance
  - Make-up
  - End-to-Center
  - Average Distances for Fitting allowance and Make-up
  - Center-to-Center
  - End-to-End Measurement
4. Cut and thread the steel pipe prior to assembling pipe connections, to include:
  - Secure the pipe in a pipe vise and prepare to make the cut
  - Correctly use pipe cutter to make the cut completely through the pipe wall
  - Use the reamer to smooth the inside cut edge of the pipe
  - Ensure the cut edges are free of burrs and defects to avoid damage to pipe threads and interference with propane system operations
  - Use the proper sized threading die over the end of the pipe according to manufacturer instructions
  - Correctly complete the pipe threading operation according to manufacturer instructions
  - Inspect the completed threads carefully for defects, restarting the process with new pipe if any defects found
  - Clean the threads of both the pipe and fitting(s), removing all metal chips, dirt, scale, rust and oil from the threaded portion inside the pipe and from the male and female threads. Use a solvent to remove all traces of cutting oil, as oil on threads will result in leakage.
  - Carefully inspect the pipe threads again for any burrs or angled threads; recut threads as necessary.
  - Apply a thread sealing compound or pipe-sealant tape to ensure a gastight connection. Apply to male threads only and avoid applying sealant material to the first two threads.
  - Secure all sections of piping according to company policies and procedures
  - Assemble the fitting on the pipe by hand. Once properly threaded, use a pipe wrench to complete the connection being careful not to over tighten connections.
  - Ensure piping is protected against corrosion prior to installation.
5. Explain the following NFPA 58 requirements for corrugated stainless steel tubing (CSST) used in outdoor service, *if applicable*:
  - Vapor service limits
  - Special outdoor applications (In-slab applications)
  - Outdoor Exposure protection
6. Explain the training required for technicians who install CSST, *if applicable*.

**Satisfactory**

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## Section Six: Install Regulators and Meters

### Task 1: Install Regulators

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and follow manufacturer instructions for the skills assessment task evaluation:*

1. Explain the NFPA 58 code requirements related to currently installed single stage regulators.
2. Identify the following NFPA 58 regulator installation requirements related to the following:
  - Overpressure protection
  - Location to meet distance requirements
  - Installation for weather and debris protection
  - Remote venting
3. Select the appropriate materials, accessories and tools, as applicable, to assemble and install the regulator
4. Install a first-stage regulator according to manufacturer instructions, to include:
  - Prepare the pigtail, hogtail, or other fittings as needed and install into the inlet of the regulator
  - Ensure the regulator vent screen is in place and the bonnet cap is properly tightened. Install a vent extension for underground tank as applicable
  - Install and carefully tighten the appropriate regulator outlet fitting. Ensure all connections are tight, not binding, cross-threaded or out of alignment
  - Connect the regulator to the service valve on the container, ensuring the vent is pointed downward to help keep debris and moisture from entering the regulator.
  - If possible*, make a loop in the pigtail connection. Ensure the container hood is properly installed to protect the regulator
  - If installing an underground tank*, install the regulator after the tank is in the ground to avoid damage during tank installation. If vent extension installed, ensure it is positioned at above-grade, and at the highest point available at the installation site.
  - Connect the piping to the outlet of the regulator
5. Install an integral 2-stage regulator on a DOT Cylinder according to manufacturer instructions, to include:
  - Prepare the pigtail, hogtail, or other fittings as needed and install into the inlet of the regulator
  - Ensure the regulator vent screen is in place, facing down, and the bonnet cap is properly tightened.
  - Ensure all connections are tight, not binding, cross-threaded or out of alignment
  - Plug the outlet of the regulator with the appropriate fitting
  - After cylinders are in place, connect the regulator using the pigtail to the service valve on the cylinder
  - Ensure the pigtail loop and regulator inlet is higher than the service valve
6. Install a second-stage regulator on a DOT Cylinder according to manufacturer instructions, to include:
  - Prepare and install the necessary fittings, inserting them into the inlets of the regulator and correctly use an approved thread sealing compound
  - Ensure the regulator vent screen is in place and the bonnet cap is properly tightened.
  - Ensure all connections are tight, not binding, cross-threaded or out of alignment
  - Plug the outlet of the regulator with the appropriate fitting
  - Attach the regulator to the top of the riser or other appropriate piping materials, ensuring the pipe is cleaned of thread burrs and thread sealing compound does not enter into the regulator body
  - Ensure the vent is pointing downward to keep debris and moisture from entering the regulator
7. Explain procedures for inspecting and protecting regulators, to include the following:
  - Regulator vent
  - Regulator bonnet cap
  - Protection from the environment
  - Protection from heat sources

**Satisfactory**

### Task 2: Install Vapor Meters

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and follow manufacturer instructions for the skills assessment task evaluation:*

1. Identify procedures for the storage and handling of vapor meters to protect against damage
2. Identify NFPA 54 requirements for selecting meter locations
3. Explain practices for preparing and mounting a vapor meter for service

*Continued*

**Task 2 continued**

4. Install a vapor meter according to manufacturer instructions, to include:
- Remove the plugs or caps from the meter inlet
  - Install required fittings or nipples into the meter inlet for making piping connections
  - Recap or plug the meter inlet to prevent moisture, dirt and debris from entering and damaging the meter
  - Install any required connection fittings on the riser or distribution line of the meter, such as swivel adaptors, an in-line shutoff, or a nipple and union from the regulator outlet, as necessary.
  - Install all mounting hardware
  - Mount the meter so it is plumb and level in all directions
  - If necessary, use a meter bar or meter mounting bracket to ensure the meter is properly supported and level in all directions

**Satisfactory**                      \* **Not Applicable**

*\*Not Applicable means that the person's job description does not require the person to perform this task, OR the company does not install vapor meters.*

**Section Seven: Container to Container Transfers and Systems Tests**

**Task 1: Identify Equipment for Container to Container Transfers**

**Evaluator: Indicate which method was used:**       **Portable Compressor**                       **Portable Liquid Pump**

*Preparation Guide: Both the Skills Evaluator and the person being evaluated wear appropriate Personal Protective Equipment (PPE) during this skills assessment task evaluation:*

1. Identify the following equipment used in container to container transfers, explaining the function and any requirements for each:
- Portable compressors
  - Liquid Transfer hoses
  - Vapor hoses
  - Liquid withdrawal valves
  - Liquid transfer valves
  - Unloading adapter
  - Sight flow glass, if applicable

**Satisfactory**                      \* **Not Applicable**

*\*Not Applicable means that the person's job description does not require the person to perform this task*

**Task 2: Perform Container to Container Transfers**

**Evaluator: Indicate which method was used:**       **Portable Compressor**                       **Portable Liquid Pump**

*Preparation Guide: Both the Skills Evaluator and the person being evaluated wear appropriate Personal Protective Equipment (PPE) during this skills assessment task evaluation:*

1. Conduct a pre-transfer review to ensure:
- Liquid will be evacuated from stationary containers (aboveground or underground).
  - A liquid transfer valve and its adapter are installed so that propane will be withdrawn through a liquid withdrawal valve installed in the container.
  - The receiving containers have adequate capacity to receive the liquid from the container being evacuated
2. Ensure procedures for evacuation safety precautions are observed, to include:
- All personnel are wearing appropriate PPE, including hand and eye protection according to manufacturer instructions while performing transfer procedures
  - Demonstrate a thorough understanding of ASME container construction, valves, and evacuation equipment used
  - Verify all hoses are designed and listed for use with liquid propane
  - Inspect all hoses to be used during the transfer process, not using any hose found to be defective
  - Remove all sources of ignition within 25 feet of the point of transfer, which is where the hoses connect to the container filler valve and the liquid withdrawal valve
  - Ensure at least one recently inspected fire extinguisher with a minimum capacity of 18lb dry chemical and B: C rating is within easy reach during the entire transfer process.

**Continued**



### Task 2 continued

3. Perform a container-to-container transfer according to company policies and procedures to include:
  - Correctly determine the amount of propane to transfer. The combined total of the current volume in the container to be evacuated and the volume in the receiving container must NOT exceed the maximum permitted filling level of the receiving container.
  - Review company policies and procedures for emergency procedures
  - Prepare the evacuation site by positioning the containers
  - Place the compressor or portable liquid pump at least 10 feet from the container to be evacuated and the receiving container, with the maximum distance dependent on the hose lengths
  - Using an approved thread-sealing compound, install a machined liquid withdrawal adapter onto the inlet of the liquid transfer valve. Inspect the machined unloading adapter O-ring or nylon seal or washer for damage, replacing if damaged before using.
  - Following manufacturer instructions for the liquid withdrawal valve carefully and slowly loosen the plug or cap from the liquid withdrawal valve, using extreme care to loosen and remove just the plug or cap, not the entire withdrawal valve. Never loosen the plug or cap more than one turn.
  - If propane liquid stops escaping out of the weep hole, it is safe to continue removing the plug or cap. Remember to follow manufacturer instructions for liquid withdrawal valves. If liquid propane does NOT stop escaping, retighten the plug or cap immediately.
  - With the transfer valve in the open position, quickly and completely thread the machined adapter attached to the transfer valve into the outlet of the liquid withdrawal valve of the container to be evacuated
  - Ensure all valves in the liquid transfer line are closed, listening for an audible “click” that signals the liquid withdrawal valve has opened and is ready for liquid withdrawal.
  - Lay out the liquid transfer hose equipped with shutoff valves at each end, keeping the hoses plugged or capped when not in use to prevent debris or water from entering.
4. Inspect and connect pressurized hoses and assemblies according manufacturer instructions:
  - If using a Portable Compressor:**
    - Connect one end of the liquid transfer hose to the outlet of the transfer valve and the other end to the fill connection on the receiving container
    - Connect a vapor hose between the discharge side of the compressor and the vapor equalizing valve (or purge adapter) on the container to be evacuated, and connect another vapor hose between the suction side of the compressor and the vapor equalizing connection on the receiving container
  - If using a Portable Liquid Pump:**
    - Connect one liquid transfer hose to the outlet of the transfer valve and the other end to the liquid pump inlet. Connect the other liquid transfer hose between the pump outlet and filler valve on the receiving container
    - Connect a vapor hose between the vapor-return connection on the container being evacuated and the vapor-return connection on the receiving container
5. Once the pump or compressor is connected:
  - Slowly open the transfer valve in the evacuating container to pressurize the liquid supply line
  - Slowly open each valve downstream and check that all connections are leak-free using a liquid leak test solution or another approved method
  - Close all valves in the line to make repairs as needed.
6. Evacuate liquid propane:
  - Turn on the portable liquid pump or portable compressor to begin evacuating propane, watching for vapor lock and cavitation
  - Monitor the liquid level gauges on both containers, ensuring a proper flow is maintained between containers
  - Verify the receiving container does not overflow. Periodically open and close the fixed liquid level gauge, ensuring the receiving container does not fill to more than 80%. If liquid comes out, stop the liquid transfer.
  - Turn off the compressor or portable liquid pump and close the valves when the liquid level in the evacuating container reaches the desired level.
7. Bleed down according to company policy and disconnect the liquid transfer hose connections at the transfer valve and at the receiving container fill connection.
8. Ensure the excess flow valve closes
9. Remove the transfer valve from the container being evacuated ensuring the cap or plug is readily available for the liquid withdrawal valve and the nylon washer or O-ring is in good condition, in place, and free of debris. Reinstall the cap or plug into the liquid withdrawal valve, being careful not to overtighten.
10. Bleed down and disconnect the vapor hose from the container, either at the vapor equalizing valve or the transfer adapter. If applicable, remove the transfer adapter from the vapor service valve and install any dust caps on the hoses or stationary valve
11. Bleed down and disconnect the vapor hose from the receiving container and install any dust caps on the hose or the vapor connection on the receiving container.
12. Bleed down and disconnect the hose from the compressor.
13. Remove any pressure gauges installed as well as any other components used during the evacuation process

**Satisfactory**

\* **Not Applicable**

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*\*Not Applicable means that the person's job description does not require the person to perform this task*

### **Task 3: Verify System Tests**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) for the following skills assessment task evaluation:*

1. Identify what the following system tests determine and then correctly perform each:
  - Pressure test per NFPA 58
  - Leak Check
  - Flow Test
  - Pressure Test per NFPA 54
  - Leak Test
  - Lock-up Test

**Satisfactory**

### **Task 4: Explain Company Policies and Procedures Related to an Uncontrolled Release of Propane**

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and follow company policies and procedures for the skills assessment task evaluation:*

**Evaluator: For purposes of this task, an "Uncontrolled Release of Propane" is one that cannot be readily shut off.**

1. Provide examples of an uncontrolled release of propane, and the types of emergency situations they can lead to.
2. Explain what is meant by "being aware of surroundings" during evacuations for an uncontrolled release of propane.
3. Correctly explain company policies and procedures for evacuating an area in the event of an uncontrolled release of propane.
4. Correctly explain company policies and procedures related to emergency responders, as applicable

**Satisfactory**

# CETP Certification Performance Evaluation / Candidate Record (4.1)

## **Completing your NPGA CETP Certification:**

- 1: Successfully pass the exam.
- 2: Complete and return the *CETP Performance Evaluation / Employee Record* to the testing center below within 12 months of passing the exam.
- 3: Complete any necessary prerequisites within 12 months of passing the exam.

Make a copy for your training records and then send to:

**Industrial Training Services, Inc.**

120 Max Hurt Drive ● Murray, KY 42071 ● PH: 270-753-2150 ext. 2 ● EMAIL: [skills@its-training.com](mailto:skills@its-training.com)

The information requested below will be used to assist in locating your records in the CETP database.  
Please make sure to complete all requested information; we thank you in advance for your assistance.

**Candidate Information:** (print or type) Test Group Number (if known): \_\_\_\_\_

Name: \_\_\_\_\_ Last four digits of SSN (only): \_\_\_\_\_

Employer: \_\_\_\_\_ Email: \_\_\_\_\_

Address: \_\_\_\_\_ Daytime Phone#: \_\_\_\_\_

City, State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

### ***Affidavit***

I affirm that I am the person who has performed those items checked on this checklist. I acknowledge that the performance checklists used are solely for the purpose of skills assessment for the CETP Certification requirements, and are not intended to replace or modify company operating or safety procedures, and may not be appropriate for use in all circumstances. I acknowledge that I am responsible for recognizing hazards and abnormal conditions in my workplace and must exercise care and good judgment, always using appropriate equipment, procedures and tools for the tasks I perform. The Propane Education and Research Council, the National Propane Gas Association and Industrial Training Services, Inc. assume no liability for my actions, or for my application of the skills assessment performance guides used in this evaluation checklist.

**Candidate Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

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**Skills Evaluator Information:** (print or type)

Name: \_\_\_\_\_

Organization/Employer: \_\_\_\_\_

### ***Affidavit***

I affirm that I am the person who has administered this checklist, and that I have conducted this Performance-Based Skills Assessment Evaluation with integrity. I also affirm that the above named Candidate is the person whose performance I evaluated, and that the above named person performed the checked tasks at the indicated level without assistance from me or any other person.

**Skill Evaluator's Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Registered Skills Evaluator Number** \_\_\_\_\_

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**Final Checklist for: 4.1 Designing and Installing Exterior Vapor Distribution Systems (VDS)**

Name: \_\_\_\_\_ Last four digits of SSN (only): \_\_\_\_\_

The candidate has been evaluated on the following tasks at the following level:  
 (The N/A option is available only as listed in the Not Applicable column/available box(s)  below. All other tasks must be completed.)

Satisfactory	Not Applicable	Section One: Design Vapor Distribution Systems: Containers and Lines
<input type="checkbox"/>		Determine Effective System Load
<input type="checkbox"/>		Identify Factors Affecting Selection of a Properly Sized Container
<input type="checkbox"/>		Select the Appropriate Container
<input type="checkbox"/>		Establish Container Location
<input type="checkbox"/>		Size and Select Pipe and Tubing
<input type="checkbox"/>		Identify Corrosion and Prevention Methods
<b>Section Two: Design Vapor Distribution Systems: Regulators and Meters</b>		
<input type="checkbox"/>		Size and Select Regulators
<input type="checkbox"/>	<input type="checkbox"/>	Identify Operations of Vapor Meters
<b>Section Three: Prepare System Components for Transport</b>		
<input type="checkbox"/>		Verify Container Condition
<input type="checkbox"/>		Prepare for Container Transport
<input type="checkbox"/>		Load Containers for Transport and Installation
<b>Section Four: Install Containers</b>		
<input type="checkbox"/>		Perform Pre-Installation Activities
<input type="checkbox"/>		Install Aboveground Containers
<input type="checkbox"/>	<input type="checkbox"/>	Install Underground Containers
<input type="checkbox"/>	<input type="checkbox"/>	Test, Troubleshoot and Retrofit Cathodic Protection Systems
<b>Section Five: Install Lines</b>		
<input type="checkbox"/>		Install Vapor Delivery Lines
<input type="checkbox"/>		Install Vapor Polyethylene (PE) Distribution Lines
<input type="checkbox"/>		Install Vapor Delivery Lines: Copper
<input type="checkbox"/>		Install Vapor Delivery Lines: Metal and CSST
<b>Section Six: Install Regulators and Meters</b>		
<input type="checkbox"/>		Install Regulators
<input type="checkbox"/>	<input type="checkbox"/>	Install Vapor Meters
<b>Section Seven: Container to Container Transfers and Systems Tests</b>		
<input type="checkbox"/>	<input type="checkbox"/>	Identify Equipment for Container to Container Transfers
<input type="checkbox"/>	<input type="checkbox"/>	Perform Container to Container Transfers
<input type="checkbox"/>		Verify Systems Tests
<input type="checkbox"/>		Explain Company Policies and Procedures Related to an Uncontrolled Release of Propane