



## 4.2 Placing Vapor Distribution Systems and Appliances into Operation

### Performance-Based Skills Assessment

# 2020



#### **Section One**

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Task 2  
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#### **Vapor Distribution System Installations**

Recognize When to Perform and Document System Tests  
Inspect and Validate Vapor Distribution System Installations  
Connect the Vapor Meter and Regulator for LP-Gas Service

#### **Section Two**

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#### **Identify Appliances in Vapor Distribution Systems**

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Identify Appliance Categories and Requirements

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#### **Identify Venting Requirements and Validate Combustion Air Requirements**

Identify Venting Requirements and Characteristics  
Validate Combustion Air Requirements

#### **Section Four**

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Perform a Leak Check

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#### **Purge Air from a Piping System**

Purge Air from a Piping System

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#### **Perform Appliance Startup**

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Identify Appliance Controls  
Identify Appliance Safety Devices  
Perform a Spillage Test

#### **Section Eight**

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#### **Identify Burning Characteristics of Propane**

Identify Burning Characteristics of Propane  
Identify Burner Components and Air Adjustments  
Recognize Basic Burner Flame Abnormalities

#### **Section Nine**

Task 1

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

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 CETP 4.2 "Placing Vapor Distribution Systems and Appliances into Operation" or is familiar with the subject matter.

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

## **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 PERC CETP Certification.

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

1. 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.
2. 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
3. All requirements and prerequisites must be met before certification will be granted.

## **4.2 Certification Requirements**

- Passing exam score on 4.2 *“Placing Vapor Distribution Services and Appliances into Operations”* exam
- Completed and signed 4.2 *“Placing Vapor Distribution Services and Appliances into Operations”* 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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Users of this material should consult the law of their individual jurisdictions for codes, standards and legal requirements applicable to them. This material is not intended to be an exhaustive treatment of the subject, and should not be interpreted as precluding other procedures that would enhance safe LP-gas operations. This training material merely suggests methods the user may find useful in implementing applicable codes, standards, and legal requirements. This publication is not intended nor should it be construed to (1) set forth procedures which are the general custom or practice in the propane industry; (2) to establish the legal standards of care owed by propane distributors to their customers; or (3) to prevent the reader from using different methods to implement applicable codes, standards or legal requirements. This material was designed to be used as a resource only to assist expert and experienced supervisors and managers in training personnel in their organizations and does not replace federal, state, local, or company safety rules. The user of this material is solely responsible for the method of implementation. The Propane Education and Research Council, the National Propane Gas Association and Industrial Training Services, Inc. assume no liability for reliance on the contents of this training material.

Issuance of this material is not intended to nor should it be construed as an undertaking to perform services on behalf of any party either for their protection or for the protection of third parties.

## **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: Vapor Distribution System Installations**

**PERC 4.2 Placing VDS and Appliances into Operation Skills Assessment (2020)**

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## Task 1: Recognize When to Perform and Document System Tests

*Preparation Guide: Wear Personal Protective Equipment (PPE) while at a customer installation or in a simulated setting for the skills evaluation task evaluation:*

1. Explain what each of the following systems tests is designed to measure and when the test should be performed:
  - Pressure Test per NFPA 54
  - Leak Check
  - Flow Test
  - Lock-up Test
  - Leak Test
2. Explain company policies and procedures for performing and documenting the results of the systems tests listed in Step 1.

**Satisfactory**

## Task 2: Inspect and Validate Vapor Distribution System Installations

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

**Inspect the following to validate a new or existing vapor distribution system installation, following applicable code requirements:**

### **Container Installation:**

1. Inspect the container installation to verify that it is properly sized to meet the total gas demand
2. Ensure the volume of propane gas supplied will meet the total gas demand of all appliances in the system operating at full capacity
3. Verify container location distance requirements are in accordance with NFPA and local code requirements, access for delivery, type of container selected, underground utilities, and special location considerations.

### **Exterior Pipe and Tubing:**

4. Verify the following, as applicable:
  - Pipe is constructed of wrought iron, black iron, galvanized steel or copper, *or*
  - Tubing is constructed of steel, copper, corrugated stainless steel tubing (CSST) or polyethylene (PE)\*

**Note: Polyethylene tubing (PE) is for underground use only**

  - Fittings are made of steel, brass, copper, malleable iron, or ductile iron
  - Anodeless risers are used for PE Piping runs.

### **Interior Pipe and Tubing**

5. Inspect the interior pipe and tubing to verify the following:
  - Piping does not cause structural stresses within building components
  - Piping inside any building is not installed in or through a clothes chute, chimney or gas vent, dumbwaiter, or elevator shaft.
  - Piping is not installed in or through an air duct, other than a combustible air duct
  - Concealed gas piping does not enter into solid partitions
  - Gas piping is not used as a ground for an electrical system
  - All gas outlets in the piping, including any valve outlets, are closed "gastight" with a plug or cap
  - Piping supports are of adequate strength and placed at proper intervals
  - Drip legs are installed properly if required by the AHJ
  - Sediment traps are installed properly at all non-attended appliances.
  - Gas piping materials are: steel and wrought iron pipe, copper pipe or tubing, or CSST

### **Exterior to Interior Piping**

6. Ensure the exterior vapor distribution lines are properly connected to the interior lines by verifying the following:
  - Piping entering the structure is protected from corrosion, any open areas around the piping are properly sealed with caulk or equivalent sealant, and metallic piping running through masonry is properly sleeved
  - Verify the space between the pipe or tubing and sleeve, as well as the space between the sleeve and the wall, are sealed with proper material.
  - Verify when dissimilar metals such as steel and copper are connected in piping, that a dielectric union or insulating coupling is used to prevent corrosion
  - Verify if PE tubing is used for the buried exterior lines, one end of the tracer wire must be brought aboveground at a building wall or riser
  - Verify if steel piping is used for the exterior lines and installed underground, that it is coated, wrapped, or otherwise protected from corrosion

*Continued*

*Task 2 continued*

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### **Regulator Section**

7. Ensure the regulator is properly selected and installed by verifying the following:
- Regulator has the flow capacity to meet the total gas demand of all the appliances and any anticipated future demand
  - Regulator is able to supply the gas at the minimum required operating pressure when the inlet pressure is at its minimum level
  - Regulator installation meets NFPA 58 requirements for building openings, sources or ignition, direct vent appliance intake openings and mechanical ventilation intakes
  - Regulator installations are protected from physical damage by snow, ice, or other weather related conditions
  - Regulator installations are protected from accumulated snow damage where ground snow may equal or exceed 175 psf
  - Verify regulators meet/adhere to the following NFPA 58 code safety precaution requirements:
    - A 2-stage regulator system is required on all fixed piping systems that serve ½ psig appliance systems
    - The installation of single-stage regulators is prohibited in new or modified fixed piping systems is prohibited except for outdoor appliances
    - The use of high pressure regulators should not be used in place of single first-stage regulators for residential or small commercial installations

### **Meter Section: If applicable (Evaluator: if the person or company does not select or install meters, go to the next step)**

8. Ensure the meter is properly selected and installed by validating the following:
- Location: in an area away from vehicle traffic and public passages, or where it will not be subjected to excessive corrosion, vibration or to water, snow, or ice damage.
  - Properly mounted and readily accessible
  - If installed in ventilated spaces, readily accessible for examination, reading, replacement or maintenance
  - If installed in a freestanding setup, the meter is installed on the riser so that the bottom of the meter is completely off the ground to help prevent corrosion
  - For existing single-stage vapor distribution systems, a 2-stage regulator system is installed to ensure the meter can receive a constant inlet pressure

### **Interior Site Assessment Walk-through**

9. Conduct a walk-through of the vapor distribution system, validating the following:
- The service valve on the propane storage container is turned off before conducting walk-through
  - No visible code violations are present within the interior vapor distribution system installation
  - No visible gas lines are damaged
  - Exposed venting is installed per code
  - Sufficient combustion air is provided where appliances are located
  - Any other deficiency that would prevent the proper operation of the system has been repaired
  - There are no open lines and all valves are shut off and plugged or capped
  - Identify appliances fueled by propane and whether the customer has altered the position of the manual shut off valve:
    - Ensure each 100% safety shutoff valve is in the "ON" position
    - Check appliances that don't have 100% safety shutoff valves to ensure manual shutoff valves are in the "OFF" position
  - Ensure there are no sources of ignition prior to introducing gas into the system, and ensure there are no appliances calling for heat:
    - Standing pilots must not be burning
    - Appliances equipped with electronic control ignition systems must be turned off at their thermostats, or otherwise set so there will be no call for heat to the appliance control valve during the leak check

## **Satisfactory**

### **Task 3: Connect the Vapor Meter and Regulator for LP-Gas Service**

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

**Evaluator – for the purpose of this assessment, use an integral 2-stage or second-stage regulator**

**Connect the Meter: If applicable (Evaluator: if the person or company does not install meters, go to the next step)**

1. Properly connect the meter for service to the interior portion of the vapor distribution line, following applicable code requirements and manufacturer instructions:
- Close the propane container shut off valve, or the manual shutoff valve if installed in the line upstream of the meter
  - Carefully remove the cap or plug from the meter outlet, as necessary. If meter is pressurized, allow it to bleed off slowly until there is no pressure in the meter, taking precautions to ensure there are no sources of ignition or openings into the buildings within 10 ft before bleeding off pressure.

**Continued**

**Task 3 continued**

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- Connect the outlet of the meter to the interior distribution piping (stub out) using the appropriate fittings and thread-sealing compound or Teflon tape
- Carefully tighten the fittings that join the meter outlet to the interior (stub out) or downstream gas piping
- Ensure the meter and gas piping is properly supported and remove any temporary supports as necessary
- Perform a leak check of the vapor distribution system prior to turning on the gas
- Start the appliances and leave them in operation. Return to the vapor meter and check the index to verify the meter is registering gas flow.
- If operating properly, leave the system operating; if it is not operating properly, isolate appliance, make repairs, and/or contact your supervisor
- Document all information as required by company policy
- Clean work site and store all tools and equipment

### **Connect the Regulator**

2. Properly connect the regulator for service to the interior portion of the vapor distribution line, following applicable code requirements, and manufacturer instructions:
  - Close the propane container shut off valve, or the manual shutoff valve, if installed, in the line upstream of the regulator
  - Carefully remove the cap or plug from the regulator outlet, as necessary. Before slowly bleeding off pressurized regulator, take precautions to ensure there are no sources of ignition or openings into the buildings within 10 ft
  - Connect the outlet of the regulator to the interior distribution piping (stub out) using the appropriate fittings and thread-sealing compound
  - Carefully tighten the fittings that join the regulator outlet to the interior (stub out) or downstream gas piping
  - Ensure the regulator is located or mounted properly with the vent pointed downward or that its vent extends away from the structure to protect it from snow or ice. Also ensure the vent is not too close to the opening of a building
  - Ensure remote regulator vents meet applicable codes or requirements
  - Perform a leak check of the vapor distribution system prior to turning on the gas
  - Perform a regulator and system flow and lock-up test after starting up the appliances
  - If operating properly, leave the system operating; if it is not operating properly, isolate appliance, make repairs, and/or contact your supervisor.
  - Document all information, and provide customer with applicable informational materials and safety information at as required by company policy
  - Clean work site and store all tools and equipment

### **Satisfactory**

## **Section Two: Identify Appliances in Vapor Distributions Systems**

### **Task 1: Identify Gas Appliances**

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

1. Explain how the following affect appliances installed to run on either propane or natural gas
  - Combustion
  - Specific Gravity
  - Heat Content
2. Demonstrate a clear understanding of NFPA requirements and local codes for adding/replacing gas appliances in a system, to include:
  - The differences between dedicated and convertible gas appliances
  - How to verify whether appliances are designed for dedicated use or are convertible to use propane
  - Appliance verification of the following:
    - Air for combustion and ventilation
    - Safe distance(s) from combustible materials
    - Installation will not cause current appliances to be unsafe for continued operation

### **Satisfactory**

### **Task 2: Identify Appliance Categories and Requirements**

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

1. Provide examples and explain when NFPA 54 requirements are applicable, for each of the following categories:
  - Listed Appliances
  - Unlisted Appliances
  - Vented Appliances
  - Unvented Appliances
2. Locate the following on the appliance manufacturer name plate:
  - Manufacturer name
  - Minimum operating requirements
  - Appliance category rating
  - Appliance input rating
3. Demonstrate a clear understanding of the differences between vented and unvented propane appliances
4. Explain the importance of the following requirements for both vented and unvented appliances as they apply to:
  - Sufficient combustion and/or ventilation air
  - Oxygen depletion safety shutoff system, as required
  - Proper and safe installation of venting system
  - Sufficient ventilation air
5. Provide examples of appliances and the venting principles that classify them as:
  - Category I - natural venting
  - Category IV - positive pressure
  - Category III - positive pressure
6. Explain code requirements for the verification of installation of both vented and unvented appliances, to include:
  - Accessibility
  - Venting system: intact, and installed in a safe manner
  - Manufacturer instructions
  - Location and clearance restrictions
  - Combustion air is sufficient
  - Oxygen depletion safety shutoff system, as required
7. Explained code requirements for the following:
  - Sediment traps -requirements
  - Manual shutoff valves -requirements
  - All appliance connectors –types

**Satisfactory**

### Section Three: Identify Venting Requirements and Validate Combustion Air Requirements

#### Task 1: Identify Venting Requirements and Characteristics

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and use NFPA 54, local codes and/or manufacturer instructions, as applicable, for the skills assessment task evaluation:*

**Evaluator:** The Candidate is to perform the following steps for each of the vent types indicated below, using applicable NFPA 54 and local codes, and manufacturer instructions

**Natural Draft Venting**

**Direct Venting**

**Mechanical Draft Venting**

1. Explain the following for each of the above listed vent systems:
  - List the major components of each venting system
  - Identify where the air for combustion is obtained
  - Explain how each venting system moves the products of combustion from the appliance to outside of the structure
  - Explain how configuration requirements (vertical or horizontal) affect the installation of each vent system
  - Provide an example of special installation concerns associated with each vent system (masonry chimneys, metal chimney liners, gas vents, B type)
  - Identify which systems have forced or induced drafts
  - Identify the applicable code requirements for venting terminations
2. Explain typical problems associated with direct venting when customers add siding or remodel the outside wall of a structure.
3. Identify the following needs for High-efficiency gas appliances:
  - Venting used
  - Ignition used
  - Condensate traps for water vapor
  - Moving combustion to the outdoors
4. Identify issues of concern when validating that a venting system has been properly installed, to include:
  - Minimizing lateral runs
  - Providing proper clearances
  - Inspecting vent components for defects
  - Avoiding internal vent obstructions
  - Avoiding existing ducts

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#### Task 2: Validate Combustion Air Requirements

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

1. Define "air for combustion" and explain the hazardous conditions that can result if gas appliances do not receive an adequate supply of combustion air.
2. Explain how the following are used by, and supplied to, the propane appliance:
  - Ventilation air
  - Dilution air
  - Make up air
3. Explain how the combination of wind pressure and temperature pressure cause infiltration
4. Explain the following for negative air pressure:
  - Causes of negative air pressure inside a building
  - Effects of negative air pressure on the venting system
  - How to avoid negative pressure
5. Use the Standard Method Calculation to determine adequate indoor air supply. If you determine there is inadequate air supply what are the next steps to obtain additional air supply?
  - Outdoor air openings
  - Engineered air supply
  - Mechanical air supply
6. Explain the general steps and requirements involved in providing additional air supply with the two-openings method and the single high-opening method.

## **Satisfactory**

### **Section Four: Perform a Leak Check**

#### **Task 1: Perform a Leak Check**

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

**Evaluator – for the purpose of this assessment, use a system that incorporates either an integral 2-stage regulator or a first stage regulator and a single, second-stage regulator.**

1. Explain what a leak check is and when a leak check should be performed
2. Explain the procedures for turning off appliances, both with and without 100% Safety Shutoff Valves, prior to the leak check
3. Review the measuring and points of connection differences for the following instruments used to perform a leak check:
  - Manometer
  - Test block gauge
  - High pressure gauge
  - Vapor meter
4. Perform a leak check on the piping system following NFPA requirements and according to company policies and procedures, to include:
  - Manometer:** Using the appropriate fitting and hose, connect the water manometer downstream of the final-stage regulator, but before the appliance gas control valve outlet test tap.
  - Test-Block Gauge:** Install the block gauge between the container service valve and the inlet of the first regulator in the system
  - High-Pressure Gauge:** Connect a 0-30 psi pressure gauge on the downstream side of the first-stage regulator or at the inlet to the second-stage regulator
  - Slowly** open the service valve on the propane storage container, leaving it open for two or three seconds, and then close it
  - Manometer:** Release enough gas from the vapor distribution system to drop the system pressure to 9" +/- ½" w.c. on the manometer to ensure all regulators in the system are unlocked and that a leak anywhere in the system is communicated to the gauging device
  - Test-Block Gauge:** Reduce the pressure reading on the block gauge by 10 psig lower than the container pressure by loosening the bleeder on the test-block gauge. The pressure reading during this step is dependent on the ambient temperature of the container. If the gas pressure increases above this reduced pressure, you must then check to ensure all service valves are fully closed and restart the leak check.
  - High-Pressure Gauge:** Release enough gas from the vapor distribution system to drop the system pressure by 5 psi from the starting pressure reading on the gauge. If the gas pressure increases above this reduced pressure, you must check to ensure all service valves are fully closed and then restart the leak check.

**Continued**

**Task 1 continued**

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- Allow the vapor distribution system to remain pressurized for 3 minutes without showing an increase or decrease in the reading on the manometer. Once the vapor distribution system is proven to be leak free, record the test results and the amount of time it took to perform the test according to company policies.
  - Manometer:** Close the appliance manual shut off valve, disconnect the testing device and fittings used and reconnect the appliance line  
**Test-Block Gauge:** Remove the block gauge and reconnect the regulator to the container service valve using the appropriate connector  
**High-Pressure Gauge:** Remove the high-pressure gauge and reinstall the test port plug or other connector used to conduct the test
  - Manometer:** Open the appliance manual gas shutoff valve to re-pressurize the test point and test for leaks at the joint using a suitable leak detection solution or device
  - Test-Block Gauge and High-Pressure Gauge:** Open the service valve(s) on the storage container to re-pressurize the system and check for leaks at the service valve connection and regulator inlet connection using a suitable leak detection solution or device
5. Perform a leak check on the piping system using a vapor meter, following NFPA requirements to include:  
***If applicable (Evaluator: if the person or company does not use vapor meters, go to the next task)***
- Close the shutoff valve, or gas cock, at the meter inlet and inspect the premises
  - Slowly* open the shutoff valve or gas cock and then close it after pressurizing the system
  - As soon as gas is introduced into the system, wet a small piece of paper and paste its edge directly over the centerline of the test hand to assist in observing movement of the hand. The observation should be made with the test hand on the upstroke.
  - Carefully watch the test dial on the meter to determine whether propane is passing through the meter, using available tables to determine test hand observation times.
  - Look for any movement of the test hand for the required length of time according to the test table; if no movement occurs during that time, there is no leak.
  - Once the vapor distribution system is proven to be leak free, record the test results and the amount of time it took to perform the test according to company policies
6. If the leak instrument indicates a decrease in pressure, you must locate the source of the leak according to company policies and procedures:
- (Mark as applicable, according to availability of test equipment)***
- Use of combustible gas indicator following the manufacturer instructions
  - Use of a suitable leak detection solution
  - Performing an isolated test and inspection of piping segments

## **Satisfactory**

### **Section Five: Purge Air from a Piping System**

#### **Task 1: Purge Air from a Piping System**

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

1. Explain the importance of purging a piping system of air before placing a gas appliance into operation
2. Identify code requirements related to safe purging procedures, to include:
  - Areas where purged air can be safely discharged indoors/outdoors; basement/crawlspace/confined spaces
  - Correctly bonding or grounding the gas pipe
  - Understanding the layout of the piping system in order to determine the flow of gas before beginning the purging process
  - Purging of all exterior distribution lines from the container to the outlet of the second-stage regulator
3. Prior to beginning the purging process, ensure the following safety precautions are followed:
  - Verify appliance shutoffs are in the closed or "OFF" position and all distribution lines not connected to an appliance are capped or plugged.
  - Verify thermostats and appliance power supplies are in the "OFF" position, and power disconnects to outdoor packaged heating and air conditioning units are in the "OFF" position
  - Verify purging ignition point is the only source of ignition in the area, and eliminate or control any other source of ignition found.
  - Ensure purging points are planned in the order lines are to be purged to minimize trapping pockets of air or inert gas.

**Continued**

**Task 1 continued**

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4. **Purge Outdoor lines:** Purge first-stage lines connecting first stage and second stage or 2 psi service regulators and distribution lines to outdoor appliances, following applicable codes, to include:
  - Identify and open a purge point at the service entrance to the building
  - Attach a remote purge line as necessary, ensuring the purging valve is closed
  - Pressurize the distribution line by slowly opening the container service valve
  - Release gas in a controlled method until the odor of propane is detected
  - Close the container service valve and reconnect any open fittings or test traps
  - Open the container service valve to pressurize the system and use a suitable leak detection method to ensure there is no leakage at the purge point
  - Verify the piping is purged
5. Explain when **purging indoor piping** is required, how the purging rate is safely controlled, and whether propane is burned or released to the outdoors when using the following methods:
  - A controlled purging burner
  - An appliance burner
  - A remote purge line that vents gas-air mix outdoors
6. **Purge indoor piping** using the controlled purged burner method according to required codes to include:
  - Ensure the gas shutoff valve upstream of the appliance is closed
  - In a 2lb vapor distribution system, ensure the purging point and connection to the purging burner are downstream of a line regulator so that the purging burner will receive purged gas at pressures reduced from 2 psig to the required burner input pressure.
  - At purging point downstream of the appliance shutoff valve, remove test tap plug, sediment trap nipple, or other fittings and install purging valve/burner connection
  - Open appliance shutoff valve and check for leaks
  - Ready the continuous source of ignition and open purging burner valve
  - Ignite propane flame by holding constant flame or ignition device next to the purging burner
  - Once line is purged and gas is present, close the appliance shutoff valve
  - Close the purging burner valve after the flame goes out
  - Remove purging valve and immediately reinstall test tap plug, sediment trap nipple, or other fittings
  - Open the appliance shutoff valve and check fittings for leaks using a suitable leak-check solution

**Satisfactory**

## Section Six: Perform Appliance Start-Up

### Task 1: Identify Requirements for Placing Appliances into Initial Operation

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

1. Identify code requirements, manufacturer instructions, and company policies for placing appliances into initial operation
2. Explain the differences between the following appliance pilots or burner ignition devices:
  - Standing pilots
  - Electronic ignitions
3. Light a standing pilot on an appliance according to manufacturer instructions, to include:
  - Read and follow the manufacturer instructions
  - Remove burner access door(s), as necessary
  - Conduct a sniff test at floor level for any possible leaks: *Do not proceed if you smell gas - shut the gas off and contact your supervisor*
  - Ensure the burner control knob is in the "OFF" position for time period specified by manufacturer instructions
  - Turn off the electrical power supply to the appliance, if applicable, to prevent the main burner from operating until the power supply is turned back on.
  - Turn the control knob to the "PILOT" position
  - While applying a continuous source of ignition to the pilot burner, depress the control knob in the pilot lighting position
  - After the pilot lights, continue to hold the control knob down in the pilot position for 30-60 seconds to allow the thermocouple tip to be heated by pilot burner.
  - Slowly release the control knob until it rises to the top of the pilot position
  - Confirm the pilot burner is properly lit by looking for a flame. If the burner stays lit, turn the knob to the "ON" position
  - Reinstall the burner access door, as necessary, to prevent flame rollout until a good draft is established
  - Turn on the main power supply and confirm the main burner lights

*Continued*

*Task 1 continued*

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- Observe the main burner for a proper blue flame
  - Verify all air has been removed from the vapor distribution piping and that the gas control is operating properly by turning the main power supply on and off so the main burner cycles through three or four call for heat and the burner shutdowns
4. Explain how to light standing pilots without pilot safety devices according to manufacturer instructions
  5. Start an electronic control ignition system on an appliance according to manufacturer instructions

**Satisfactory**

## Task 2: Perform System Flow and Lock-Up Tests

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

Following NFPA requirements and manufacturer instructions:

1. Explain the following for performing flow and lock-up tests within the vapor distribution system:
  - What the flow test measures and where it is performed within the vapor distribution system
  - What the lock-up test measures and where it is performed within the vapor distribution system
  - Which test is typically performed first, and why?
2. Perform a system flow and lock-up test following safety precautions, to include:
  - Install a manometer or pressure measuring device in the test tap of the appliance shutoff valve or the gas control inlet test tap farthest from the regulator
  - Operate all available propane appliances at full operating capacity, or according to company policy
  - Check the delivered pressure shown on the manometer while the appliances are operating
  - If necessary, adjust the delivery pressure of the second-stage or line regulator to 11" w.c. or to the manufacturer specifications
3. If adequate pressure is not maintained with all connected gas appliances operating, perform a flow test at the second stage or line regulator, and determine next steps based on manufacturer instructions
4. Perform a lock-up test for a second or integral 2-stage regulator following safety precautions, to include:
  - Place the pressure-measuring device at the appropriate test tap location anywhere in the system downstream of the regulator being measured
  - Turn all appliance controls OFF
  - Close the appliance shutoff valves to any appliance without a 100% pilot safety shutoff device
  - Leave the container service valve open to maintain system pressure. The pressure will increase slightly and then stop, indicating lock-up pressure.
  - Verify the pressure does not exceed 14" w.c. or manufacturer instructions
  - Observe the pressure for at least one minute or until there is a steady pressure reading.
  - Determine next steps according to final reading on pressure-reading device and manufacturer instructions
5. If the outlet pressure is too high, perform a lock-up test at the first-stage regulator to determine next steps, according to manufacturer instructions

**Satisfactory**

## Section Seven: Identify Appliance Controls and Safety Devices and Perform a Spillage Test

### Task 1: Identify Appliance Controls

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

1. Identify the basic purpose of the following categories of appliance controls:
  - Gas Controls
  - Ignitions controls and devices
  - Safety devices
2. Demonstrate the procedures for testing the proper operation of the following:
  - Mechanical gas control
  - Pressure regulated gas control valve
  - Thermostat

**Satisfactory**

## Task 2: Identify Appliance Safety Devices

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

1. Explain the purpose of appliance safety devices
2. Explain how each of the following function as an appliance safety device and demonstrate and/or explain how to verify the proper operation of each:
  - Oxygen depletion sensors
  - High-limit switches
  - Water pressure relief devices
  - Low water cut-off devices
  - Electronic control ignition system flame sensors
  - Flame roll out and Energy Cut-Off (ECO) devices
  - Water heater temperature and pressure relief valves
  - Fan control switches

**Satisfactory**

## Task 3: Perform a Spillage Test

*Preparation Guide: Wear appropriate Personal Protective Equipment (PPE) and work with an appliance equipped with a draft hood or diverter and a natural draft venting system for the skills assessment task evaluation:*

1. Explain the following in reference to a spillage test:
  - The term "spillage"
  - Type of vented appliances that should be checked for spillage
  - Potential dangers spillage presents inside a structure
  - Necessary safety precautions for a spillage test
2. Identify the type of appliance venting systems that do not require a spillage test.
3. Perform a spillage test according manufacturer instructions

**Satisfactory**

## Section Eight: Identify Burning Characteristics of Propane

### Task 1: Identify Burning Characteristics of Propane

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

1. Correctly identify the products of complete combustion of propane.
2. Correctly identify the zones and characteristics for the individual cones of a proper flame:
  - Cone 1
  - Cone 2
  - Cone 3
  - Cone 4
3. Identify typical appliance ignition sources for propane to ignite and burn.
4. Explain how the following sources of air are supplied to support complete combustion:
  - Primary Air
  - Secondary Air
5. Describe the following and their required characteristics for proper burner operation:
  - Rapid ignition
  - No flame lift
  - Uniformity
  - Silence
6. Explain the need for proper adjustment of air supplied to the burner and the consequences of:
  - Inadequate air supply to the burner
  - Excessive air supply to the burner

**Satisfactory**

## Task 2: Identify Burner Components and Air Adjustments

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

1. Verify fuel gas input pressure is appropriate according to manufacturer instructions prior to making adjustments to the appliance burner.
2. Explain the basic principles of operation for a propane burner.
3. Explain the differences between fixed and adjustable air burners, and provide examples of appliances where they can be found
4. Identify the following components of an adjustable burner, explaining the basic purpose of each:
  - Orifice: Fixed orifices and Universal orifices
  - Venturi (or mixing tube)
  - Primary Air Opening
  - Primary Air Shutter
  - Burner Head
5. Check the primary air adjustment while the burner is operating to ensure a proper flame

**Satisfactory**

## Task 3: Recognize Basic Burner Flame Abnormalities

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

1. Describe the following flame problems, where the problem occurs within the adjustable burner, and the necessary steps to resolve the problem:
  - Flashback
  - Extinction pop
  - Yellow flame
2. Describe the following flame problems and the next steps to ensure a more serious or unsafe condition does not exist:
  - Fluctuating flame
  - Unstable or wavering flame
  - Flame lifting
  - Floating flame
  - Flame roll out
3. Explain how to handle flame abnormalities in direct vent appliances
4. Explain the characteristics of:
  - Gas odor at primary air openings
  - Burner corrosion

**Satisfactory**

## Section Nine: Explain Company Policies and Procedures Related to an Uncontrolled Release of Propane

### Task 1: 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 (4.2)

### Completing your CETP Certification

**Step 1: Successfully pass the exam**

**Step 2: Complete and return the CETP Performance Evaluation / Employee Record to the testing center below within 12 months of passing the exam**

**Step 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 - *required for processing*\*** \_\_\_\_\_

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**Final Checklist for: 4.2 Placing Appliances and VDS into Operation**

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: Vapor Distribution Systems Installations
<input type="checkbox"/>		Recognize When to Perform and Document System Tests
<input type="checkbox"/>		Inspect and Validate Vapor Distribution System Installations
<input type="checkbox"/>		Connect the Vapor Meter and Regulator for LP-Gas Service
Section Two: Identify Appliances in Vapor Distribution Systems		
<input type="checkbox"/>		Identify Gas Appliances
<input type="checkbox"/>		Identify Appliance Categories and Requirements
Section Three: Identify Venting Requirements and Validate Combustion Air Requirements		
<input type="checkbox"/>		Identify Venting Requirements and Characteristics
<input type="checkbox"/>		Validate Combustion Air Requirements
Section Four: Perform a Leak Check		
<input type="checkbox"/>		Perform a Leak Check
Section Five: Purge Air from a Piping System		
<input type="checkbox"/>		Purge Air from a Piping System
Section Six: Perform Appliance Startup		
<input type="checkbox"/>		Identify Requirements for Placing Appliances into Initial Operation
<input type="checkbox"/>		Perform System Flow and Lock-up Tests
Section Seven: Identify Appliance Controls and Safety Devices and Perform Spillage Test		
<input type="checkbox"/>		Identify Appliance Controls
<input type="checkbox"/>		Identify Appliance Safety Devices
<input type="checkbox"/>		Perform a Spillage Test
Section Eight: Identify Burning Characteristics of Propane		
<input type="checkbox"/>		Identify Burning Characteristics of Propane
<input type="checkbox"/>		Identify Burner Components and Air Adjustments
<input type="checkbox"/>		Recognize Basic Burner Flame Abnormalities
Section Nine: Explain Company Policies and Procedures Related to an Uncontrolled Release of Propane		
<input type="checkbox"/>		Explain Company Policies and Procedures Related to an Uncontrolled Release of Propane

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