April 2009 Safety Meeting
Conducting Regulator Performance Tests

As a follow up to the February 2009 safety topic on regulators, we will cover two important operational tests. These tests should be performed to determine that the settings on pressure regulators are proper for flow conditions to the appliance and that pressure regulators lock-up properly under no-flow conditions.

Performing A Flow Pressure Test

The regulator flow pressure test is done first, making out-put pressure adjustments if needed.

Step 1: Install a water column manometer or other suitable low pressure measuring device in the second-stage regulator outlet test tap, or in the test tap of an appliance shut-off valve at the appliance farthest from the regulator.

Step 2: Relight all pilots and operate all appliances at full capacity.

Step 3: Check the flow pressure shown on the manometer with all appliances operating. If necessary, adjust the 2nd stage or line regulator to 11 inches water column. Delivery (flow) pressure must not fall to less than the appliances' required input pressures as given on the manufacturer's appliance rating plates.

If adequate flow pressure is not maintained with all connected gas appliances operating, check for the following problems:

- The regulator output capacity may not be adequate to supply the connected appliances.
- The service regulator upstream may not be properly sized.
- Piping may be too small and friction losses may be limiting the gas volume and pressure available to the appliances and/or regulator being flow tested.

If the flow tests are satisfactory, the next check is to test the regulator lock-up.

Performing A Regulator Lock-Up Test

Step 1: Turn all appliance controls off.

Step 2: Close all appliance shut-off valves.

Step 3: Leave the container service valve open in order to maintain pressure on the system. With the appliance shut-offs in the off position, the pressure will increase slightly then stop. This is the lock-up pressure. The lock-up pressure should not exceed the flow pressure by more than 30 percent.

Step 4: Watch the pressure for one minute. If the flow pressure was 11 inches water column, then the lock-up pressure should not exceed 14.3 inches water column. The

pressure should stay steady and not creep up during your observation period. If the regulator fails to lock-up or creeps upward, the regulator is malfunctioning. This problem indicates the regulator must be replaced.

Never exceed the manufacturer's recommendation for flow and lock-up pressures. Never attempt to perform these tests unless you have been properly trained.

Documentation

The job isn't finished until all paperwork is properly completed. All required pressure, flow, and lock-up tests and leak checks must be documented on the designated company form or report per your company's standard operating procedures (SOP).

Closing

Operating pressures are very critical to proper appliance operation. Many high efficiency appliances will not operate if regulator lock-up pressure is too high or flow pressures are not within operating range. Always consult the appliance manufacturer's operating instruction for required gas pressure information.

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Name: _____ Date: _____

Instructions: Read and answer each of the following questions. When complete, grade the test and review incorrect answers so each employee is "armed" with the correct answers before they leave the training.

1. A general guide line for regulator lock-up pressure is that it should not be in excess of _____ higher than flow pressure.
   a. 10%
   b. 25%
   c. 30%
   d. 100%

2. When performing the regulator flow test, _____ of the gas appliances should be operating.
   a. all
   b. first
   c. last
   d. none

3. During the lock-up test, you should watch the pressure for _____.
   a. 30 seconds
   b. 1 minute
   c. 2 minutes
   d. 3 minutes

4. Delivery (flow) pressure must not fall to less than the appliances' required input pressures as given on the manufacturer's appliance rating plates.
   a. True
   b. False

5. As required by NFPA 54, a leak check and pressure test must be documented, but a flow and lock-up test can be omitted from documentation.
   a. True
   b. False

April 2009 Test

Answer Sheet

1. c.
2. a.
3. b.
4. a.
5. b.