

**BELL SYSTEM PRACTICES**  
**Outside Plant Construction**  
**and Maintenance**

**SECTION G10.212.3**  
**Issue 1, April, 1953**  
**AT&T Co Standard**

## **TESTING MANHOLE ATMOSPHERE**

### **SUCTION GAS INDICATOR**

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#### **1. GENERAL**

1.01 This section covers the use of the Suction Gas Indicator to detect the presence of combustible gases such as natural gas, methane, butane and propane, in manholes and cable vaults, and to determine whether the atmosphere is deficient in oxygen.

#### **2. PRECAUTIONS**

2.01 The Suction Gas Indicator must not be used to test an atmosphere which may contain manufactured gas or other gas mixture containing free hydrogen, until the atmosphere has first been tested with a Carbon Monoxide Detector.

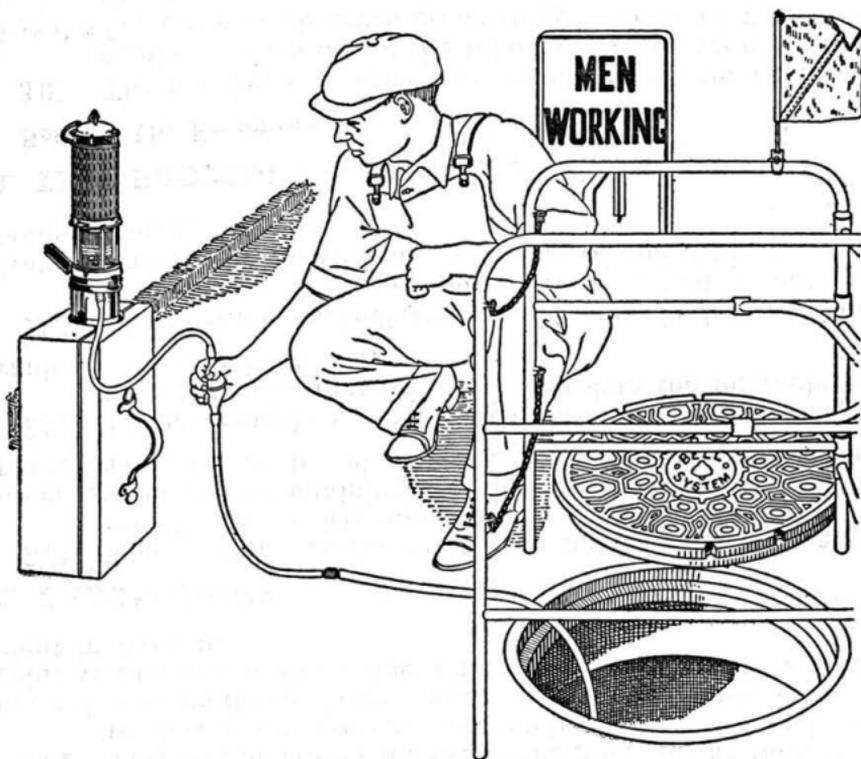
2.02 If the ampoule is not discolored, a test may be made with the indicator; otherwise ventilate the manhole or vault in the usual manner.

2.03 **The Suction Gas Indicator should never be lowered into a manhole:** The atmosphere to be tested should be drawn through the instrument by means of the aspirator and sampling hose.

#### **3. TEST PROCEDURE—MANHOLES**

##### **Setting Up Equipment**

3.01 The Suction Gas Indicator should be set up near the manhole, as shown on the following page. Arrange it so that the flame can be observed either directly or by its reflection in the mirror.



3.02 The pressure end of the aspirator bulb should be connected to the nozzle which is attached to the flame arrestor. The suction end of the bulb should be connected to the rubber sampling hose. By placing the finger over one end of the bulb and then operating it, it is possible to distinguish between the pressure and suction ends of the bulb; the end which draws the finger toward the bulb is the suction end.

### **Lighting Wick and Adjusting Flame**

3.03 Before lighting the wick, the instrument should be purged with fresh air by compressing the aspirator bulb at least once for each foot of hose, with the free end away from the manhole opening. After lighting, the flame should be adjusted to a height of one-half inch as indicated by the scored reference line on the glass chimney, or if the chimney has three scored lines, adjust the height of the flame to the center line. Allow the lamp to burn four to five minutes so that the flame will reach its normal operating temperature and then readjust the flame to the proper height.

## **Placing Hose**

3.04 With the cover removed, the free end of the hose should be lowered to about one foot from the floor or level of the water in the manhole. A second test should be made with the end of the hose raised to within a foot of the manhole roof.

## **Operation of Bulb**

3.05 Hold the bulb in the vertical position with the pressure end up and compress it at least once for every foot of hose length. This will fill the instrument with the air to be tested. During the test, the bulb should be fully compressed with a smooth rhythm about once per second, to prevent fresh air from entering the combustion chamber through the gauze and diluting the sample.

## **Indication of Combustible Gas**

3.06 An increase in the height of the flame indicates that a combustible gas is present in the manhole. If gas is indicated, the manhole should be ventilated as covered in another section of the Practices.

## **Indication of Oxygen Deficiency**

3.07 A deficiency of oxygen is indicated if the height of the flame lowers or is extinguished. The flame will extinguish when the proportion of oxygen in the mixture is 17 per cent or less (normal air contains about 21 per cent oxygen). If a deficiency is indicated, the manhole should be ventilated as covered in another section of the Practices.

## **4. CABLE VAULTS**

4.01 To test the atmosphere, proceed as follows:

- (1) Set up the indicator on the carrying case near the door.
- (2) Open the vault door, lay the free end of the hose on the floor and then close the door as much as practicable without squeezing the hose.
- (3) Test the atmosphere by aspirating air from the vault.

4.02 If gas is detected, withdraw the hose and close the door.

The condition should then be reported to the supervisor who will arrange for ventilation, plugging of ducts if necessary, and other precautions. Care should be taken to ensure that the method of ventilation employed does not force gas from the vault into other parts of the building.