

Fire Investigation Independent Study Continuing Education

NFPA 921 UNIT #7 – Study Guide

NFPA 921 Guide for Fire and Explosion Investigations 2004 Edition

Objective: Given an examination the participant shall demonstrate a knowledge and understanding of building fuel gas systems as they relate to the investigation of the cause of fires.

Reading/study assignment: NFPA 921 Guide for Fire and Explosion Investigations, 2004 Edition, pp. 921-80 through 921-87 (Chapter 9)

Study/reference questions:

Chapter 7 – Building fuel Gas Systems

What can cause the loss of odorant in gas?

Where are fuel gas systems found and why should the fire investigator have an understanding of them?

What is commercial butane?

One pound per square inch (psi) equals how many inches of water column (w.c.)?

What are stain tubes and for what purpose are they used?

What are fugitive gases and why is the fire investigator concerned with them?

Review and study common piping in buildings items listed below.

- Common Piping in Buildings

- Size of Piping

- Piping Materials

- Joints and Fittings

- Piping Installation

- Main Shutoff Valves

- Prohibited Locations

- Electrical Bonding and Grounding

Can fuel gas systems be both a fuel and an ignition source? How?

How can fuel gas systems affect fire spread?

What are fuel gases and which are most commonly encountered by the fire investigator?

What are natural gas systems?

What are the vapor density, LEL, UEL, and ignition temperature ranges of commercial propane?

What are some of the other fuel gases that may be encountered?

What is commercial propane and how is it different than natural gas?

What is propane HD5?

What is the ignition temperature range of most fuel gases and what are some ignition sources?

What is odorization of gases why is done and what is added as an odorant?

What is a gas meter and where should it be installed?

Review and study service piping systems items listed below.

- Underground Piping

- Valves

- Gas Burners

- Manual Ignition

- Pilot Lights

- Pilotless Igniters

What are transmission pipelines?

What are the normal working pressures for natural gas and non-industrial propane in most structures and appliances?

Can gas odorant be lost to pipe walls? How?

What are distribution pipelines (mains)?

What are service lines?

What are manufactured gases and where are they used?

What are the vapor density, LEL, UEL, and ignition temperature ranges of natural gas?

What are some of the pressures and sizes of lines usually associated with transmission pipelines, mains, and service lines?

What are LP-gas systems and how do they differ from natural gas systems?

What is natural gas?

Review and study the following list of items associated with LP-gas systems.

- Tanks

- Cylinders

- Container Appurtenances

- Pressure relief Devices

- Connections for Flow Control

- Liquid Level gauging Devices

- Pressure Gauges

Fusible Plugs
Pressure Regulation
Vaporizers

Are some fuel gas system components common or similar for various fuel gases?

What are pressure regulators, what is their purpose, how do they work, and how can they fail?

What are flares when referring to fires and fuel gas systems?

What are LP storage containers, how do they operate, what is their typical working pressure, and who regulates their design?

What is absorption? How may it affect gas odorant?

Review and study common appliance and equipment requirements items listed below.

Common Appliance and Equipment Requirements

Installation

Approved Appliances, Accessories, and Equipment

Type of Gas

Areas of Flammable Vapors

Gas Appliance Pressure Regulators

Accessibility for Service

Clearance to Combustible Materials

Electrical Connections

Venting and Air Supply

Appliance Controls

How can fuel gas systems influence the way a building burns?

What are the seven main areas of domestic, commercial, or industrial use that utilize fuel gases in structures and what does each of these areas involve and/or include?

Carefully study & review the sections concerning investigating fuel gas systems (9.9 - 9.9.7.2).

NOTE: An errata was issued on May 11, 2004 concerning Chapter 9, page 921-87 (D). Chapter 9 section 9.9.7.2 (D) change word “Adsorption” to “Absorption” in both the title and the first sentence. This affects older printings of the 2004 edition. If you have a later printing it may have been corrected.