

Fire Investigation Independent Study Continuing Education
NFPA 921 UNIT #17 – 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 failure analysis and analytical tools 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. 921-141 through 921-149 (Chapter 20)

Study/reference questions:

Chapter 20 – Failure Analysis and Analytical Tools

How may heat release history estimates be developed in the use of time lines?

What are time lines, how may they be used, and what is needed to construct them?

What is FMEA?

Study and review the following models information, 20.4.1-20.4.8.3(C)

- Heat transfer analysis
- Flammable gas concentrations
- Hydraulic analysis
- Thermodynamic chemical equilibrium analysis
- Structural analysis
- Egress analysis
- Fire dynamics analysis
- Limitations of mathematical modeling (20.4.9)

What are sources of soft time and what are examples?

What is hard time? (No, this is not the result after obtaining a conviction.)

What are fault trees, how and why are they used, and what are sources of data for these?

How may analytical methods be used by the fire investigator?

Study and review data required for modeling and testing, 20.6-20.6.3.

- Structural analysis
- Materials and contents
- Ventilation

What is soft time and what are some examples?

What is systems analysis and how and why is it used?

How may observed flame height be relevant in use of time lines?

What are micro and macro evaluations, what are parallel time lines and what are examples?

What does the fire investigator need to consider with FMEA and where can information be obtained?

What is the intention of mathematical models and what may be needed to complete a mathematical analysis?

Where may hard time information be obtained?

What is failure mode and effects analysis and how is it used?

How may detection and suppression information be used in time lines?

Study and review the following fire testing information, 20.5-20.5.3.

- Role of fire testing

- Fire test methods

- Limitations of fire testing

What is a benchmark event and what are some examples?

Why and where may multiple time lines be used?

What are relative and estimated times and how may they be used?

How may mathematical modeling be used by the fire investigator?