Chapter 4

Fire Service Communications

Chapter Overview

Fighting a fire requires the coordination of numerous resources and people. Different crews and equipment fill various functions on the fire ground, many of which occur simultaneously or must not start until something else has been accomplished. Ensuring a smooth interaction between all the firefighting tasks being performed requires good communications among fire suppression crews, officers, and members of the Incident Command System. In addition, fire departments need to have good communications protocols, techniques, and equipment to manage incoming calls for emergency assistance. Finally, fire service communications also encompass postincident reporting because sharing data and information about the cause of the fire and activities undertaken to suppress a fire is important for preventing fires and being able to suppress them more safely and efficiently. This chapter focuses on the processes, techniques, and equipment of fire service communications that a fire fighter needs to master to ensure personal safety, smooth operations, and adequate incident reporting.

After students complete this chapter and the related course work, they will be able to describe the roles of the telecommunicator and dispatch. Students will also understand how to receive an emergency call, obtain necessary information, and initiate a response. They will also be able to discuss radio codes, emergency traffic, and basic incident reports.

Objectives and Resources

Fire Fighter I

Knowledge Objectives

After studying this chapter, you will be able to:

* Describe the role of the communications center in the fire service. (NFPA 5.2, pp 92–93)
* Describe the role and responsibilities of a telecommunicator. (NFPA 5.2.1, p 93)
* List the requirements of a communications center. (pp 93–94)
* Describe the equipment used in a communications center. (NFPA 5.2.1, p 94)
* Describe how computer-aided dispatch (CAD) assists in dispatching the correct resources to an emergency incident. (NFPA 5.2.1, p 94)
* Describe the basic services provided by the communications center. (NFPA 5.2.1, pp 95–96)
* List the five major steps in processing an emergency incident. (NFPA 5.2.1A, p 96)
* Describe how telecommunicators conduct a telephone interrogation. (NFPA 5.2.2, pp 96–97)
* Describe how municipal fire alarm systems, private and automatic fire alarm systems, and citizens can activate the emergency response system. (NFPA 5.2.1, pp 98–99)
* Describe how location validation systems operate. (NFPA 5.2.1, pp 98–99)
* Describe the three types of fire service radios. (NFPA 5.2.3, pp 103–104)
* Describe how two-way radio systems operate. (NFPA 5.2.3, pp 103–104)
* Explain how a repeater system works to enhance fire service communications. (NFPA 5.2.3, pp 105–106)
* Explain how a trunking system works to enhance fire service communications. (NFPA 5.2.3, p 106)
* Describe the basic principles of effective radio communication. (NFPA 5.2.3, pp 106–108)
* Describe when to use plain language and how 10-codes are implemented in fire service communications. (NFPA 5.2.3A, pp 107–108)
* Outline the information provided in arrival and progress reports. (p 108–109)
* Describe fire department procedures for answering nonemergency business and personal telephone calls. (NFPA 5.2.2, 5.2.2A, p 111)

Skills Objectives

After studying this chapter, you will be able to perform the following skills:

* Initiate a response to a simulated emergency. (NFPA 5.2.1B, p 102)
* Observe the operation of a communications center. (p 103)
* Display how to use a portable radio. (NFPA 5.2.3B, p 107)
* Operate and answer the fire station telephone. (NFPA 5.2.1B, 5.2.2B, p 111)

Fire Fighter II

Knowledge Objectives

After studying this chapter, you will be able to:

* Define emergency traffic. (NFPA 6.2.2, 6.2.2A, p 109)
* Explain how to initiate a mayday call. (NFPA 6.2.2, 6.2.2A, p 109)
* Describe common evacuation signals. (NFPA 6.2.2, 6.2.2A, p 109)
* Explain the importance of an incident report to the entire fire service. (NFPA 6.2, 6.2.1, pp 109–110)
* Describe how to collect the necessary information for a thorough incident report. (NFPA 6.2.1, 6.2.1A, pp 109–110)
* Describe the resources that list the codes used in incident reports. (NFPA 6.2.1A, pp 109–110)
* Explain the consequences of an incomplete or inaccurate incident report. (NFPA 6.2.1A, pp 109–110)

Skills Objectives

After studying this chapter, you will be able to perform the following skills:

* Display how to use a portable radio. (NFPA 6.2.2B, p 107)
* Describe how to use the National Fire Incident Reporting System Data Entry Tool. (NFPA 6.2.1B, p 110)

Additional NFPA Standards

* NFPA 901*, Standard Classifications for Incident Reporting and Fire Protection Data*
* NFPA 902, *Fire Reporting Field Incident Guide*
* NFPA 1061, *Standard for Professional Qualifications for Public Safety Telecommunicator*
* NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*

Reading and Preparation

* Review all instructional materials, including *Fundamentals of Fire Fighter Skills*, Chapter 4, and all related presentation support materials.
* Review local firefighting protocols for Chapter 4.

Support Materials

* Dry erase board and markers or chalkboard and chalk
* LCD projector, slide projector, overhead projector, and projection screen
* PowerPoint presentation, overhead transparencies, or slides
* Digital camera with downloading or projection capabilities
* Copies of any incident reports used by the local fire department. If reports are filed by computer, bring a computer with applicable software and forms, as well as a projector for demonstration of report completion.
* Audiotapes of actual radio communications (both good and bad)

Enhancements

* Direct the students to visit the Internet at www.FireFighter.jbpub.com for online activities.
* Direct the students to relevant sections in the Student Workbook for application of the content introduced in this chapter.
* Direct the students to take practice/final examinations in the Navigate Test Prep to prepare for examinations.

Teaching Tips and Activities

* Communications and report writing are best taught using a role-play, scenario-based method.
* Play audio tapes of both good and bad radio communications. Students find listening to such transmissions exciting, and it is a great way to highlight do’s and don’t’s of radio communications.

Presentation Overview

|  |  |  |  |
| --- | --- | --- | --- |
| **Total time**: 2 hours, 36.5 minutes  (with enhancements) | **Activity Type** | **Time** | **Level** |
| **Pre-Lecture** |  |  |  |
| **You Are the Fire Fighter** | Small Group Activity/Discussion | 5 minutes | Fire Fighter I and II |
| **Lecture** |  |  |  |
| **I. Introduction** | Lecture/Discussion | 15 minutes | Fire Fighter I and II |
| **II. The Communications Center** | Lecture/Discussion | 19.5 minutes | Fire Fighter I |
| **III. Communications Center Operations** | Lecture/Discussion | 22.5 minutes | Fire Fighter I |
| **IV. Radio Systems** | Lecture/Discussion | 16.5 minutes | Fire Fighter I and II |
| **V. Records and Reporting** | Lecture/Discussion | 7.5 minutes | Fire Fighter II |
| **VI. Taking Calls: Emergency, Nonemergency, and Personal Calls** | Lecture/Discussion | 3 minutes | Fire Fighter I |
| **VII. Summary** | Lecture/Discussion | 7.5 minutes | Fire Fighter I and II |
| **Post-Lecture** |  |  |  |
| **I. Wrap-Up Activities**  **A. Fire Fighter in Action**  **B. Technology Resources** | Individual Activity/Small Group Activity/Discussion | 40 minutes | Fire Fighter I and II |
| **II. Lesson Review** | Discussion | 15 minutes | Fire Fighter I and II |
| **III. Assignments** | Lecture | 5 minutes | Fire Fighter I and II |

Pre-Lecture

* 1. I. You Are the Fire Fighter

Time: 5 Minutes

Level: Fire Fighter I and II

Small Group Activity/Discussion

Use this activity to motivate students to learn the knowledge and skills needed to communicate on the fire ground, in the station, and with the public.

Purpose

To allow students an opportunity to explore the significance and concerns associated with basic fire service communications.

Instructor Directions

1. Direct students to read the “You Are the Fire Fighter” scenario found in the beginning of Chapter 4.
2. You may assign students to a partner or a group. Direct them to review the discussion questions at the end of the scenario and prepare a response to each question. Facilitate a class dialogue centered on the discussion questions.
3. You may also assign this as an individual activity and ask students to turn in their comments on a separate piece of paper.

Lecture

* 1. SLIDE TEXT LECTURE NOTE
  2. I. Introduction

Time: 15 Minutes

Slides: 1–10

Level: Fire Fighter I and II

Lecture/Discussion

* + 1. A functional communications system is essential to the fire department because it links:

Slide 10

Introduction

* Fire fighters must be familiar with the communications systems, equipment, and procedures used in their departments.
* Basic administration requires an efficient communications network.

Slide 9

Introduction

* A functional communications system links:
* The public and the fire department
* Fire fighters on the scene and the rest of the organization
* The fire department with other agencies and facilities

Slides 2-8

Chapter Objectives

Slide 1

CHAPTER 4

* Fire Service Communications
  + - 1. The public and the fire department
      2. Fire fighters on the scene and the rest of the organization
      3. The fire department with other agencies and facilities
    1. Fire fighters must be familiar with the communications systems, equipment, and procedures used in their departments.
    2. Basic administration and day-to-day management require an effective communications network.
  1. II. The Communications Center

Time: 19.5 Minutes

Slides: 11-23

Level: Fire Fighter I

Lecture/Discussion

* + 1. Introduction to the Communications Center

Slide 11

The Communications Center

* Communications center is the hub of the fire department response system.
* Central processing point for emergency incident information
* Connects and controls the department’s communications systems
  + - 1. The communications center is the hub of the fire department response system.
         1. It is the central processing point for all information relating to an emergency incident and all of the information relating to the location, status, and activities of fire department units.
         2. It connects and controls all of the department’s communications systems.
         3. The size and complexity of a communications center will vary, depending on the department’s needs.
      2. Type of communications centers include:

Slide 12

The Communications Center

* Size and complexity vary, depending on department needs.
* Types
* Stand-alone
* Regional
* Co-located
* Integrated
  + - * 1. Stand-alone

Serves a specific fire department

* + - * 1. Regional

Serves many fire departments

* + - * 1. Co-located

Shares space with other communications centers of public safety agencies

* + - * 1. Integrated
        2. Personnel are cross-trained and provide communications for multiple types of public safety agencies.
    1. Telecommunicators

Slide 13

Telecommunicators

* Personnel trained to work in a public safety communications environment.
* Required skills:
* Perform multiple tasks effectively and make decisions quickly
* Communicate effectively
* Operate all systems and equipment
* Understand and follow operational procedures
  + - 1. Personnel who are professionally trained to work in a public safety communications environment
         1. Have specific training for their positions.
         2. Professional certification ensures that telecommunicators are skilled and competent.
      2. Telecommunicators must be able to understand and follow complicated procedures, perform multiple tasks effectively, memorize information, and make decisions quickly.
         1. They must be able to communicate effectively with citizens to obtain critical information, even when the citizen is highly stressed or in extreme personal danger.
         2. They must be skilled in operating all of the systems and equipment in the communications center.
         3. They must understand and follow the fire department’s operational procedures, particularly those relating to dispatch policies and protocols, radio communications, and incident management.
    1. Communications Facility Requirements

Slide 14

Communications Facility Requirements

* Designed to ensure a very high degree of operational reliability
* Well-protected against threats
* Equipped with emergency generators
* Secured to prevent unauthorized entry
* Should be a back-up center
  + - 1. A fire department communications center must be designed to ensure a very high degree of operational reliability.
         1. It must be well-protected against natural and human-made threats.
         2. It must have emergency generators.
         3. It must be secured to prevent unauthorized entry.
         4. There should be a back-up communications center at a different location.

Ensures ongoing operations

* + - * 1. There should be a plan in place for reporting emergencies.

Some communities have local officials available for citizens to report emergencies.

* + 1. Communications Center Equipment

Slide 15

Communications Center Equipment

* Dedicated 911 telephones
* Public telephones
* Direct-line telephones to other agencies
* Equipment to receive alarms from public and/or private fire alarm systems
* Computers and/or hard copy files and maps to locate addresses and select units to dispatch
  + - 1. Specific equipment requirements depend on the size of the operation and the configuration of local communications systems.
      2. Most centers will have the following equipment:
         1. Dedicated 911 telephones
         2. Public telephones
         3. Direct-line telephones to other agencies
         4. Equipment to receive alarms from public and/or private fire alarm systems
         5. Computers and/or hard copy files and maps to locate addresses and select units to dispatch
         6. Equipment for alerting and dispatching units to emergency calls

Slide 16

Communications Center Equipment

* Equipment for alerting and dispatching units to emergency calls
* Two-way radio system(s)
* Recording devices to record telephone calls and radio traffic
* Back-up electrical generators
* Records and record management systems
  + - * 1. Two-way radio system(s)
        2. Recording devices to record telephone calls and radio traffic
        3. Back-up electrical generators
        4. Records and record management systems
    1. Computer-Aided Dispatch (CAD)

Slide 17

Computer-Aided Dispatch (CAD)

* Automates functions required for receiving calls and dispatching and monitoring resources
* Shortens time required to take and dispatch calls
  + - 1. A CAD system automates the functions required for receiving emergency calls and dispatching and monitoring emergency response resources.
         1. The system knows which units are available to respond to a call, which units are assigned to incidents, and which units are temporarily assigned to cover different areas.
         2. The system selects the units that can respond quickly to an alarm, even if some of the units that would normally respond are unavailable.
      2. Some systems can track the exact location of vehicles using global positioning system (GPS) technology.

Slide 18

Computer-Aided Dispatch (CAD)

* Some systems can track the location of vehicles using global positioning system (GPS) technology.
* Some systems transmit information directly to station or apparatus computers.
  + - 1. Some systems transmit dispatch information directly to computers that are located in the fire station or on the apparatus.
      2. Some systems can also provide immediate access to information such as preincident plans and hazardous materials lists for an address.
      3. Mobile data terminals are computer devices that transmit data by radio.
    1. Voice Recorders and Activity Logs

Slide 19

Voice Recorders and Activity Logs

* Everything that happens in a communications center is recorded using either:
* Voice recording system: Audio record of what is said over telephone lines and radios
* Activity logging system: Written or computerized record of what happened
  + - 1. Everything that happens in a communications center is recorded using either:
         1. A voice recording system

An audio record of what is said over telephone lines and radios

* + - * 1. An activity logging system

A written or computerized record of what happened

* + - 1. Records include every call that is entered, every unit that is dispatched, and every significant event that occurs in relation to an emergency incident.

Slide 20

Voice Recorders and Activity Logs

* Timestamps record date and time of event
* These are legal records of the official delivery of a government service by the fire department.
* Records may be required for legal proceedings, sometimes years after the incident occurred.
  + - * 1. Timestamps record the date and time of each event.
        2. These are legal records of the official delivery of a government service by the fire department.
        3. Records may be required for legal proceedings, sometimes years after the incident occurred.
      1. Voice recorders and activity logs are maintained for several reasons:

Slide 21

Voice Recorders and Activity Logs

* Reasons for voice recorders and activity logs:
* Defending the department’s actions
* Demonstrating that the organization performed ethically, responsibly, and professionally
* Reviewing and analyzing information about department operations
  + - * 1. Defending the fire department’s actions when questions are raised about an unfortunate outcome
        2. Demonstrating that the organization and its employees performed ethically, responsibly, and professionally

Records also make it difficult to hide an error if a mistake was made.

* + - * 1. Reviewing and analyzing information about department operations
    1. Call Response and Dispatch

Slide 22

Call Response and Dispatch

* Critical functions performed by most CAD systems:
* Verifying an address
* Determining which units should respond to an alarm
* Dispatching must follow the standard protocols adopted by the fire department.
  + - 1. Critical functions performed by most CAD systems include verifying an address and determining which units should respond to an alarm.
         1. The fire department needs to know exactly where the emergency is.
         2. The fire department needs to know what units are available to handle the emergency.
      2. Dispatching of units must follow the standard dispatching protocols adopted by the fire department.
      3. The generally accepted performance objective, from the time a call reaches the communications center until the units are dispatched is 1 minute or less.

Slide 23

Call Response and Dispatch

* Generally accepted “answer-to-dispatch” performance objective is 1 minute or less.
* Most requests are made by telephone.
  + - 1. Most requests for fire department response are made by telephone.
      2. Most areas in the United States and Canada have implemented the 911 system.
  1. III. Communications Center Operations

Time: 22.5 Minutes

Slides: 24-38

Level: Fire Fighter I

Lecture/Discussion/Demonstration

* + 1. Introduction to Communications Center Operations

Slide 24

Communications Center Operations

* Basic functions performed:
* Receiving calls and dispatching units
* Supporting and coordinating unit operations
* Keeping track of status of each unit
* Monitoring level of coverage, managing deployment
* Notifying designated agencies of particular events
* Maintaining records of activities
* Maintaining information required for dispatch
  + - 1. The basic functions performed in a communications center include:
         1. Receiving calls for emergency incidents and dispatching fire department units
         2. Supporting the operations of fire department units delivering emergency services
         3. Coordinating fire department operations with other agencies
         4. Keeping track of the status of each fire department unit at all times
         5. Monitoring the level of coverage and managing the deployment of available units
         6. Notifying designated individuals and agencies of particular events and situations
         7. Maintaining records of all emergency-related activities
         8. Maintaining information required for dispatch purposes
    1. Receiving and Dispatching Emergency Calls

Slide 25

Receiving and Dispatching Emergency Calls

* Receiving and dispatching process:
* Call receipt
* Location validation
* Classification and prioritization
* Unit selection
* Dispatch
  + - 1. The major steps in processing an emergency incident include:
         1. Call receipt
         2. Location validation
         3. Classification and prioritization
         4. Unit selection
         5. Dispatch
    1. Call Receipt

Slide 26

Call Receipt

* Most communities use 911 to report emergencies.
* Telecommunicator conducts telephone interrogation.
* Determines location of emergency
* Determines nature of situation
  + - 1. Most communities use 911 to report emergencies.
      2. The telecommunicator must conduct a telephone interrogation to obtain the required information, including:
         1. The caller’s exact location
         2. The nature of the problem

Remember that the caller thinks the situation is an emergency; treat all calls as emergencies until you can determine that no emergency exists.

Do not allow gaps of silence to occur.

Some departments may require telecommunicators to obtain additional information, such as the caller’s name and telephone number.

* + - 1. Communications centers must be able to receive and process calls made by hearing-impaired callers who use specially adapted phone systems such as:

Slide 27

TDD/TTY/Text Telephones

* Communications centers must be able to process calls made by hearing-impaired callers.
* TDD (telecommunications device for the deaf)
* TTY (teletype)
* Text telephones
  + - * 1. TDD (telecommunications device for the deaf)
        2. TTY (teletype)
        3. Text telephones
      1. Direct-line telephones connect two predetermined points. When one end of the phone is picked up, it immediately rings the other phone.
         1. Direct lines may also connect hospitals, private alarm companies, utility companies, and airports.
      2. Municipal fire alarm systems are fire alarm boxes and emergency telephones installed on street corners or in public places.

Slide 28

Municipal Fire Alarm Systems

* Most communities have fire alarm boxes or emergency telephones in public places.
* Fire alarm box transmits coded signals to the communications center.
  + - * 1. Fire alarm box transmits a coded signal to the communications center.
        2. Although an alarm is sent, it does not indicate what kind of emergency is occurring.
        3. Call boxes allow the user to communicate the specifics of the emergency to the communication center.
      1. Private and automatic fire alarm systems transmit alarms to fire departments and communications centers. Most commercial, industrial, and residential building today use heat detectors, smoke detectors, and other devices to initiate the alarm.

Slide 29

Private and Automatic Fire Alarm Systems

* Connection used to transmit alarms from private systems to the communications center will vary.
  + - 1. Walk-ins are people who report an emergency at the fire station. The station should contact and advice the communication center immediately.

Slide 30

Walk-ins

* People may come to the fire station.
* Contact and advise the communications center of the situation.
  + 1. Location Validation

Slide 31

Location Validation

* Enhanced 911 systems have features that help the telecommunicator obtain information.
* Automatic Number Identification (ANI)
* Automatic Location Identification (ALI)
  + - 1. Ensures that the information received is adequate to dispatch units to the correct location
      2. Enhanced 911 systems have features that can help telecommunicators obtain information.
         1. Automatic Number Identification (ANI) shows the telephone number from which a call originated.
         2. Automatic Location Identification (ALI) shows the address from which a call originated.
      3. The caller’s location may not always be the actual location of the emergency incident.

Slide 32

Location Validation

* Caller’s location may not always be the location of the emergency incident.
* Always confirm the information is correct.
* GPS technology is helping to resolve some of these issues.
  + - 1. Always confirm with the caller that the information obtained from the enhanced 911 system is correct.
      2. Wireless telephones can create challenges for communications centers because:
         1. Wireless 911 calls are routed to communications centers based on the cell site that picks up the call not based on the actual location of the caller.
         2. It can be difficult to determine the exact location of the incident because ANI and ALI were developed for hard-wired telephone systems.
         3. People who call 911 on their cellular telephones may not know their exact location.
         4. GPS technology in wireless telephones can pinpoint the geographic coordinates of a 911 call.
      3. Skill Drill 4-1 lists the steps for initiating a response to a simulated incident.
    1. Call Classification and Prioritization

Slide 33

Call Classification and Prioritization

* Process of assigning a response category based on the nature of the reported problem
* Nature of the call dictates which units or combinations of units should be dispatched.
  + - 1. The process of assigning a response category based on the nature of the reported problem. The nature of the call dictates which units or combinations of units should be dispatched.
    1. Unit Selection

Slide 34

Unit Selection

* Determining which units to dispatch
* Run cards list units in order of response.
* Some vehicles have locator systems.
* Most CAD systems are programmed to select units automatically.
  + - 1. The process of determining exactly which unit or units to dispatch based on the location and classification of the incident
      2. Run cards list units in proper order of response based on response distance or estimated response time.
      3. Some systems are equipped with automatic vehicle locator systems.
      4. Most CAD systems are programmed to select the units for an incident automatically based on the location, call classification, and actual status of all units.
      5. The CAD system will recommend a dispatch assignment, which the telecommunicator can accept or adjust, based on circumstances or special information.
    1. Dispatch

Slide 35

Dispatch

* Alerting selected units to respond and transmitting information to them
* Verbal messages
* CAD system alerts
* Pagers, outdoor sirens, horns, or whistles
* Some allow text messages, including incident information
  + - 1. The step of alerting the selected units to respond and transmitting the information to them
      2. Most fire departments dispatch verbal messages to the appropriate fire stations.
      3. A CAD system can be programmed to alert the appropriate fire stations automatically.
      4. Volunteer fire departments rely on pagers, outdoor sirens, horns, or whistles to notify their members of an emergency.
         1. Some CAD systems allow text messages, including incident information.
    1. Operational Support and Coordination

Slide 36

Operational Support and Coordination

* All communications between the units and the communications center during an entire incident
* Progress and incident status reports
* Requests for additional units
* Notifications
* Requests for information or outside resources
  + - 1. Operational support and coordination encompass all communications between the units and the communications center during an entire incident, including:
         1. Progress and incident status reports
         2. Requests for additional units or release of extra units
         3. Notifications
         4. Requests for information or outside resources
    1. Status Tracking and Deployment Management

Slide 37

Status Tracking and Deployment Management

* Communications center must know location and status of every unit at all times.
* CAD systems allow status changes to be entered through digital status units or computer terminals.
* Communications centers must continually monitor availability of units in each area and redeploy units when coverage is insufficient.
  + - 1. The communications center must know the location and status of every fire department unit at all times.
      2. CAD systems make this job much easier because status changes can be entered through digital status units or computer terminals.
      3. Communications centers also must continually monitor the availability of units in each geographic area and redeploy units when there is insufficient coverage in an area.
    1. Touring the Communications Center

Slide 38

Touring the Communications Center

* New fire fighters should tour the communications center.
  + - 1. New fire fighters should tour the emergency communications center.
      2. Skill Drill 4-2 lists the steps for touring a communications center.
  1. IV. Radio Systems

Time: 16.5 Minutes

Slides: 39-49

Level: Fire Fighter I and II

Lecture/Discussion/Demonstration

* + 1. Introduction to Radio Systems

Slide 39

Radio Systems

* Radios link the communications center and individual units.
* Radios link units at an incident scene.
* Radios are also used to transmit dispatch information to fire stations, to page volunteers, and to link mobile computer terminals.
  + - 1. Radios link the communications center and individual units.
      2. Radios link units at an incident scene.
      3. A radio is the fire fighter’s only link to the incident organization and the only means to call for help in a dangerous situation.
      4. Radios also are used to transmit dispatch information to fire stations, to page volunteer fire fighters, and to link mobile computer terminals.
      5. The design, installation, and operation of two-way radio systems is closely regulated by the Federal Communications Commission (FCC).
    1. Radio Equipment

Slide 40

Radio Equipment

* Portable radio: Hand-held radio small enough for a fire fighter to carry at all times
* Mobile radio: More powerful radios permanently mounted in vehicles
  + - 1. A portable radio is a hand-held two-way radio small enough for a fire fighter to carry at all times.
      2. Mobile radios are more powerful two-way radios permanently mounted in vehicles and powered by the vehicle’s electrical system.
      3. Base station radios are permanently mounted in a building, such as a fire station, communications center, or remote transmitter site.

Slide 41

Radio Equipment

* Base station radios are permanently mounted in a building.
* Mobile data terminals transmit data by radio.
  + 1. Radio Operation

Slide 42

Radio Operation

* A radio channel uses one or two frequencies.
* A simplex channel uses only one frequency.
* A duplex channel uses two frequencies.
* Duplex channels are used with repeater systems.
  + - 1. A radio channel uses either one frequency or two frequencies.
         1. A simplex channel uses only one frequency to transmit and receive signals.
         2. A duplex channel uses two frequencies: one to transmit signals and another to receive them.
         3. Duplex channels are used with repeater systems.

Slide 43

Radio Operation

Figure 4-16: Direct and repeater channels send and receive transmissions in different ways. A. Direct channel. B. Repeater channel.

* + - 1. US Fire Service frequencies are in several different ranges:

Slide 44

Radio Operations

* US Fire Service frequencies:
* VHF low band: 33 to 46 MHz
* VHF high band: 150 to 174 MHz
* UHF band: 450 to 460 MHz
* Trunked: 800-MHz band
* A radio can be programmed to operate on several frequencies in a particular band but cannot be used across different bands.
  + - * 1. VHF low band: 33 to 46 MHz
        2. VHF high band: 150 to 174 MHz
        3. UHF band: 450 to 460 MHz
        4. Trunked: 800-MHz band
        5. Each band has certain advantages and disadvantages relating to geographic coverage, topography, and penetration into structures.
      1. Generally, one radio can be programmed to operate on several frequencies in a particular band but cannot be used across different bands.
         1. This creates an interoperability problem if neighboring public safety agencies are on different bands.
      2. Radio communications over long distances require the use of a repeater, which receives transmissions on one channel of a duplex system and rebroadcasts them on the second duplex channel.

Slide 45

Radio Operations

* Communications over long distances require the use of a repeater.
* Simplex radio channel for on-scene communications, sometimes called a talk-around channel.
  + - * 1. Duplex radios can be used in simplex mode to create a “talk-around” channel, which can be useful for short, point-to-point (ie, not using a repeater) communications on the fire ground.
        2. Some departments switch to a talk-around channel for on-scene communications. A talk-around channel bypasses the repeater system.
      1. Many newer fire service radio communications are “trunked.”

Slide 46

Radio Operations

* New radio technologies use trunking.
* Link a group of frequencies
* Messages transmitted over whatever frequencies available
* Make eavesdropping more difficult
* Allows different radios to be connected
* Many agencies on same system
  + - * 1. Trunked systems link a group of frequencies.
        2. Messages are transmitted over whatever frequencies in the group are available at the time of transmission.
        3. Trunked systems use radio frequencies more efficiently and make eavesdropping of communications more difficult.
        4. Allows different radios to be connected.
        5. Many agencies can be on the same system.
    1. Using a Radio

Slide 47

Using a Radio

* Fire fighters must know how to operate any radio, and how to work with the radio system(s) used by the fire department.
* Familiarize yourself with department SOPs.
  + - 1. It is the responsibility of fire fighters to know how to operate any radio assigned to them and how to work with the particular radio system(s) used by the fire department.
         1. To use a radio, follow the steps in Skill Drill 4-3.
      2. Familiarize yourself with departmental standard operating procedures (SOPs) governing the use of radios.
      3. Radio transmissions are recorded, and the public can listen to them using scanners. Avoid saying anything of a sensitive nature or anything you might later regret.
      4. National Fire Protection Association (NFPA) standards recommend using plain English rather than codes. Follow local communications protocols.
      5. Arrival and progress reports should be given on a regular basis using the radio.

Slide 48

Using a Radio

* NFPA standards recommend using plain English.
* Arrival and progress reports should be given on a regular basis.
* Allows IC to assess progress of the incident
  + - * 1. This is usually the responsibility of the unit officer or incident commander (IC).
        2. Time marking allows the IC to assess the progress of the incident and determine if whether changes should be made in strategy and tactics.
    1. Normal radio transmissions can be interrupted for emergency traffic.

**FIRE FIGHTER II**

Slide 49

Emergency Traffic

* Urgent messages take priority
* Portable radios have button to transmit emergency signals
* Many departments have evacuation signals
* After an evacuation, radio airwaves should remain clear.
  + - 1. An urgent message taking priority over all other communications
         1. A distinctive alert tone is used to notify all users to stand by.
      2. A fire fighter's call for help is the most important.
         1. Most departments use mayday.
         2. All other traffic stops immediately.
         3. Fire fighters should study and practice this procedure.
      3. Many portable radios have an emergency button to transmit an emergency signal.
         1. Fire fighters should learn the procedure for use.
      4. Many departments have evacuation signals to warn personnel to pull back to a safe location.
         1. Commonly used signals are:

Three blasts on an air horn

Sirens sounded on “high-low” for 15 seconds

On the radio by the IC

* + - 1. Following an evacuation, radio airwaves should remain clear.
  1. V. Records and Reporting

Time: 7.5 Minutes

Slides: 50-54

Level: Fire Fighter II

Lecture/Discussion/Demonstration

* + 1. Introduction to Incident Reporting

Slide 50

Records and Reporting

* Complete a report after each incident.
* Reports should include:
* Where and when the incident occurred
* Who was involved
* What happened
* How the fire started
* The extent of damage
* Any injuries or fatalities
  + - 1. After each incident, the officer in charge will need to complete an incident report.
      2. Reports should include:
         1. Where and when the incident occurred

**FIRE FIGHTER II**

* + - * 1. Who was involved
        2. What happened
        3. How the fire started
        4. The extent of damage
        5. Any injuries or fatalities
      1. Many departments enter incident reports on the computer.

Slide 51

Records and Reporting

* Most incident reports are computerized, although some are still paper based.
* The National Fire Incident Reporting System (NFIRS) is a voluntary reporting system widely used throughout the United States.
  + - * 1. Some still use paper-based systems.
      1. The National Fire Incident Reporting System (NFIRS) is widely used throughout the United States.
         1. Used to compile and analyze incident reports at the local, state, and/or national levels.
         2. Data are used to help reduce the loss of life and property by fire.
    1. Obtaining the Necessary Information
       1. The property owner and/or occupant is a primary source of information for the report.
       2. Any bystanders or eyewitnesses should also be questioned on what they observed.
       3. Serial numbers and model numbers should be noted on the scene for inclusion in the report.
    2. Required Coding Procedures

Slide 53

Required Coding Procedures

* Codes are used to indicate incident type, actions taken, and property use.
* Written guides and/or computer programs provide codes and explanations of codes used in fire reports.

Slide 52

Obtaining the Necessary Information

* Property owner and/or occupant is a primary source of information.
* Bystanders or eyewitnesses should also be questioned.
* Serial numbers and model numbers should be noted on the scene.
  + - 1. Because fire reports are statistically analyzed for patterns and trends, they often require that data (such as incident type, actions taken, and property use) be coded numerically.
      2. Written guides and/or computer programs provide codes and explanations of codes used in fire reports.
    1. Consequences of Incomplete and Inaccurate Reports

Slide 54

Consequences of Incomplete and Inaccurate Reports

* Reports can become admissible evidence in a court case.
* Incomplete or inaccurate reports may be used to prove that the fire department was negligent.
  + - 1. Information must be complete, clear, and concise because these records can become admissible evidence in a court case.
      2. Fire reports are considered as public records under the Freedom of Information Act and may be viewed by an attorney, an insurance company, the news media, or the public.
      3. Incomplete or inaccurate reports may be used to prove that the fire department was negligent.
    1. Using the NFIRS Data Entry Tool
       1. Skill Drill 4-4 reviews the steps for the NFIRS.
  1. VI. Taking Calls: Emergency, Nonemergency, and Personal Calls

Time: 3 Minutes

Slides: 55-56

Level: Fire Fighter I

Lecture/Discussion/Demonstration

* + 1. One of the first things you should learn when assigned to a fire station is how to use the telephone and intercom systems.

Slide 55

Taking Calls

* Know how to answer telephones and use the station intercom.
* Keep personal calls to a minimum.
* Use a standard greeting.
  + - 1. Follow your departmental SOPs for obtaining information and processing calls.
    1. Keep personal calls to a minimum.
    2. Use your department’s standard greeting when you answer the telephone.
    3. Be prompt, polite, professional, and concise.

Slide 56

Taking Calls

* Be prompt, polite, professional, and concise.
* Remember that an emergency call can come in on any telephone line.
  + 1. Remember that an emergency call can come in on any fire department telephone line.
    2. Skill Drill 4-5 lists the steps in obtaining essential information from a caller for an emergency response.
  1. VII. Summary

Time: 7.5 Minutes

Slides: 57-61

Level: Fire Fighter I and II

Lecture/Discussion

* + 1. Every fire department depends on a communications center.

Slide 57

Summary

* Every fire department depends on a communications center.
* Telecommunicators obtain information from citizens and relay it to dispatch.
* Vital pieces of equipment are located in the communications center.
* CAD enables telecommunicators to work effectively.
  + - 1. Central processing point for all emergency information
    1. Telecommunicators obtain information from citizens, process it, and relay it to dispatch.
    2. Vital pieces of equipment are located in the communications center.
    3. CAD enables telecommunicators to work effectively.
    4. Everything that is said over the telephone or radio is recorded by the communication center.

Slide 58

Summary

* Everything that is said over the telephone or radio is recorded.
* The communications center performs many basic functions.
* There are five major steps in processing an emergency incident.
* Calls may be received in many different ways.
  + 1. The communications center performs many basic functions.
    2. There are five major steps in processing an emergency incident.
    3. Calls may be received in many different ways:
       1. Telephone
       2. Municipal fire alarm systems
       3. Private and automatic fire alarm systems
       4. Walk-ins
    4. Enhanced 911 systems display additional information.

Slide 59

Summary

* Enhanced 911 systems display additional information.
* Fire department communications depend on two-way radio systems.
* Three types of radios may be used.
* Radios work by broadcasting electronic signals on certain frequencies.
* Radio channels use either one or two frequencies.
  + 1. Fire department communications depend on two-way radio systems.
    2. Three types of radios may be used.
    3. Radios work by broadcasting electronic signals on certain frequencies.
    4. Radio channels use either one or two frequencies.
    5. Each radio channel uses two separate frequencies in a repeater system.

Slide 60

Summary

* Each radio channel uses two separate frequencies in a repeater system.
* In a trunking system, a group of shared frequencies are controlled by computer.
* A brief radio report should be given by the first-arriving unit.
* Emergency traffic takes priority over all other communications.
  + 1. In a trunking system, a group of shared frequencies are controlled by computer.
    2. A brief radio report should be given by the first-arriving unit.
    3. Emergency traffic takes priority over all other communications.
    4. When transmitting emergency traffic, the telecommunicator generates alert tones.

Slide 61

Summary

* When transmitting emergency traffic, the telecommunicator generates alert tones.
* A fire fighter's call for help is the most important emergency traffic.
* Incident reports describe where and when the incident occurred, who was involved, and what happened.
* A fire fighter who answers the telephone is a representative of the fire department.
  + 1. A fire fighter's call for help is the most important emergency traffic.
    2. Incident reports describe where and when the incident occurred, who was involved, and what happened.
    3. Legally, records and reports are vital parts of the emergency.
    4. A fire fighter who answers the telephone is a representative of the fire department.

Post-Lecture

* 1. I. Wrap-Up Activities

Time: 40 Minutes

Level: Fire Fighter I and II

Small Group Activity/Individual Activity/Discussion

Fire Fighter in Action and/or Fire Fighter II in Action

This activity is designed to assist the student in gaining a further understanding of fire service communications. The activity incorporates both critical thinking and the application of fire fighter knowledge.

Purpose

This activity allows students an opportunity to analyze a firefighting scenario and develop responses to critical thinking questions.

Instructor Directions

1. Direct students to read the “Fire Fighter in Action” and/or “Firefighter II in Action” scenario located in the Wrap-Up section at the end of Chapter 4.
2. Direct students to read and individually answer the quiz questions at the end of the scenario. Allow approximately 10 minutes for this part of the activity. Facilitate a class review and dialogue of the answers, allowing students to correct responses as needed. Use the answers noted below to assist in building this review. Allow approximately 10 minutes for this part of the activity.
3. You may also assign these as individual activities and ask students to turn in their comments on a separate piece of paper.

Answers to Multiple Choice Questions

1. A
2. A
3. B
4. D
5. B
6. C

Technology Resources

This activity requires students to have access to the Internet. This may be accomplished through personal access, employer access, or a local educational institution. Some community colleges, universities, or adult education centers may have classrooms with Internet capability that will allow for this activity to be completed in class. Check out local access points and encourage students to complete this activity as part of their ongoing reinforcement of firefighting knowledge and skills.

Purpose

To provide students an opportunity to reinforce chapter material through use of online Internet activities.

Instructor Directions

1. Use the Internet and go to www.FireFighter.jbpub.com. Follow the directions on the Web site to access the exercises for Chapter 4.
2. Review the chapter activities and take note of desired or correct student responses.
3. As time allows, conduct an in-class review of the Internet activities and provide feedback to students as needed.
4. Be sure to check the Web site before assigning these activities because specific chapter-related activities may change from time to time.
   1. II. Lesson Review

Time: 15 Minutes

Level: Fire Fighter I and II

Discussion

Note: Facilitate the review of this lesson’s major topics using the review questions as direct questions or overhead transparencies. Answers are found throughout this lesson plan.

Fire Fighter I

* + 1. What are the components of a communications system?
    2. What are some of the requirements for a communications facility?
    3. Describe the use of a CAD system.
    4. What is clear speech, and why is it preferred by the NFPA for fire service communications?
    5. Why is it important for dispatch centers to support the operations of fire department units delivering emergency services?
    6. What are the five major steps in processing an emergency incident?
    7. What is the importance of a telephone interrogation?
    8. Describe the features on an enhanced 9-1-1 system.
    9. What is the purpose of a run card?
    10. What are the three types of fire service radios?

Fire Fighter II

**FF II**

* + 1. Describe the importance of a national incident reporting system.
    2. Who is considered the primary source of information for a report?
    3. Why can improper or inadequate documentation have long-term negative consequences?
    4. Describe the steps for using the NFIRS Data Entry Tool.
  1. III. Assignments

Time: 5 Minutes

Level: Fire Fighter I and II

Lecture

* + 1. Advise students to review materials for a quiz (determine date/time)
    2. Direct students to read the next chapter in *Fundamentals of Fire Fighter Skills* as listed in your syllabus (or reading assignment sheet) to prepare for the next class session.