



FEMA Communications Unit Leader

Student Guide

E/L-969

November 2014



FEMA

Communications Unit Leader
EMI Course Number: E/L-969

STUDENT GUIDE

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Unit 1: Course Introduction

STUDENT GUIDE

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Objectives

By the end of this unit, students will be able to:

- Identify course objectives and position-specific resource materials for the position of Communications Unit Leader (COML)
- Describe the course objective
- Demonstrate knowledge of the Incident Command System (ICS)

Methodology

The purpose of this unit is to introduce students to the structure of the course, the course prerequisites, and gauge students' previous coursework and on-the-job experience.

This unit uses lecture, discussion based activities, an exercise and quiz.

Content from the Course Introduction will not specifically be tested through a quiz or the final exam; however, before Unit 2, an ICS pretest will be given at the end of this unit to assist in evaluating level of practical ICS knowledge the students possess.

The purpose of Exercise 1 is to provide the participants with an opportunity to interact with other students at their tables and collectively identify their expectations for the course.

Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	30 minutes
Exercise 1	30 minutes
ICS Pretest	30 minutes
Total Time	1 hour, 30 minutes

Topic All-Hazards Communications Unit Leader



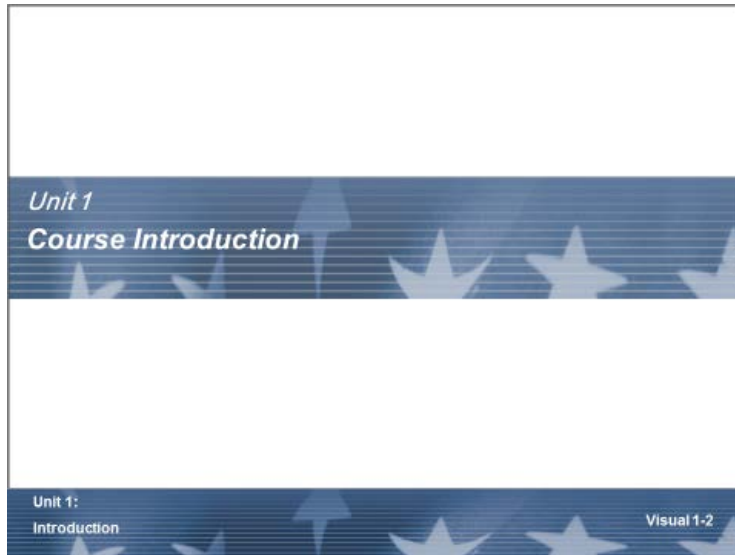
Key Points

Scope Statement

Through this unit, students will learn the objectives of the course. Additionally, students will confirm their knowledge of the roles and responsibilities of the Communications Unit Leader (COML).

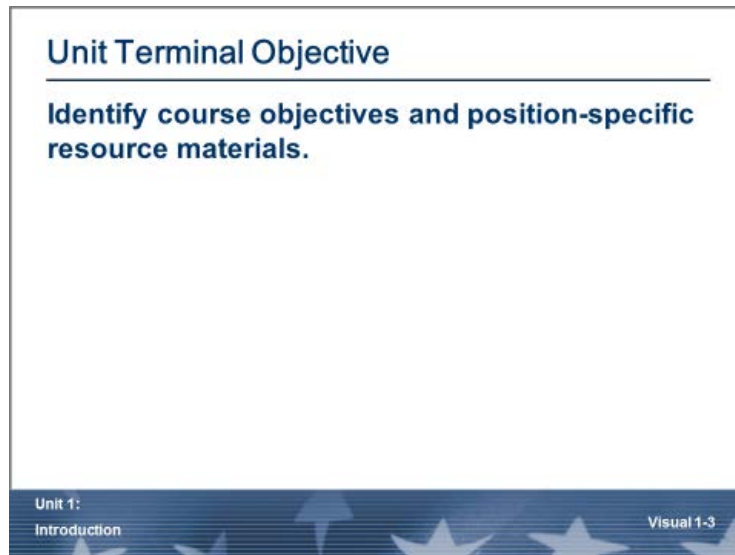
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective



Key Points

Unit Terminal Objective


At the end of this unit, the student will be able to identify course objectives and position-specific resource materials for the position of COML.

Unit Enabling Objectives

- Describe the course objectives
- Demonstrate knowledge of the Incident Command System (ICS)

Introduction

- **Discuss administrative requirements of the course**
- **Cover SWIC's request for Google mapping of COMLs**
- **Introduce instructors, course coordinator, and students**
- **Present course objectives**
- **Explain course process and develop expectations**



Unit 1:
Introduction

Visual 1-4

Key Points

Course Administration

- **Start times**
- **Breaks**
- **Facility access procedures**
- **Restrooms**
- **Cell phones/pagers**
- **Emergency procedures**



Unit 1:
Introduction

Visual 1-5

Key Points

Topic OEC Personal Information Announcement

OEC Personal Information Announcement

- **Communication Assets Survey & Mapping Tool Next Generation (CASM NextGen)**
 - **Pinpoint student's home agency location**
 - **COML, COML TtT, COMT, COMT TtT, and AUXCOMM Trainees: Student's name, organization, contact information**
 - **Only shared with State representatives (SWIC)**

Unit 1:
Introduction

Visual 1-6

Key Points

Topic OEC Personal Information Announcement

OEC Personal Information Announcement (cont'd)

- **CASM NextGen**
 - **System requires username and password**
 - **SWIC only allowed to view their State data and/or bordering States**
 - **Goal is to graphically map COML locations**
 - **Students may opt out**

Unit 1:
Introduction

Visual 1-7

Key Points

Topic What is a Communications Unit Leader?

What is a COML

- Plans and manages the technical and operational aspects of the communications function during an incident or event
- Prepares Incident Radio Communications Plan (ICS 205)
- Establishes Incident Communications Center (ICC)
- Orders and manages personnel, equipment
- Establishes needed capabilities
- Participates in incident action planning

Unit 1:
Introduction

Visual 1-6

Key Points

The COML is responsible for a number of tasks, including:

- Planning and managing the technical and operational aspects of the communications function during an incident or event
- Preparing an Incident Radio Communications Plan (ICS 205)
- Establishing an Incident Communications Center (ICC)
- Ordering and managing personnel, equipment
- Establishing needed capabilities
- Participating in incident action planning

ICS 205 Example

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)										
1. Incident Name: COML COURSE			2. Date/Time Prepared: Date: 09/06/2011 Time: 0737			3. Operational Period: Date From: 09/06/2011 Time From: 0738				
4. Basic Radio Channel Use:										
Zone Grp	Ch #	Function	Channel Name/Trunked Radio System/Talkgroup	Assignment	RX Freq M or W	RX Tone NAC	TX Freq M or W	TX Tone NAC	Mode (A, D, or H)	Remarks
1	1	COMMAND	CFD-TAC1	COMMAND	151.2050 N	136.5	159.5950 N	136.5	A	UNIFIED COMMAND
3	2	TACTICAL	VTAC11	OPERATIONS	151.1375 N	CSQ	151.1375 N	156.7	A	AES1 - May need radio programming
1	3	TACTICAL	VTAC12	FIRE	154.4525 N	CAD	154.4525 N	156.7	A	Will need additional tactical channels for special operations
1	4	TACTICAL	VTAC14	LE	159.4725 N	CSQ	159.4725 N	156.7	A	Will need additional tactical channels for special operations
1	5	AIR	AIR TO GROUND	AIR TO GROUND	170.0000 N	CSQ	170.0000 N	NONE	A	To support EMS operations
3	6	TACTICAL	VTAC13	EMS	158.7375 N	CSQ	158.7375 N	156.7	A	Will need additional channel for transportation
5. Special Instructions:										
Contact the Incident Communications Center (ICC) for additional tactical channels and communication support needs. COML will coordinate with the COMC for additional channels as needed. Advise the ICC of any communication issues.										
6. Prepared by (Communications Unit Leader): Name: <u>S. Holburn, COML</u> Signature: <u>S. Holburn</u>										
ICS 205		IAP Page		Date/Time: 09/06/2011 / 0737						

Unit 1:
Introduction

Visual 1-9

Key Points

One of the primary responsibilities of a COML is drafting the ICS 205 and submitting it for review and approval.


Topic Introductions

Introductions

Instructors

Students

- **Name**
- **Discipline & Agency**
- **The level of government you represent:**
 - **Local, County, Region, Tribal, State, Federal**
- **Your involvement in communications**



Unit 1:
Introduction

Visual 1-10

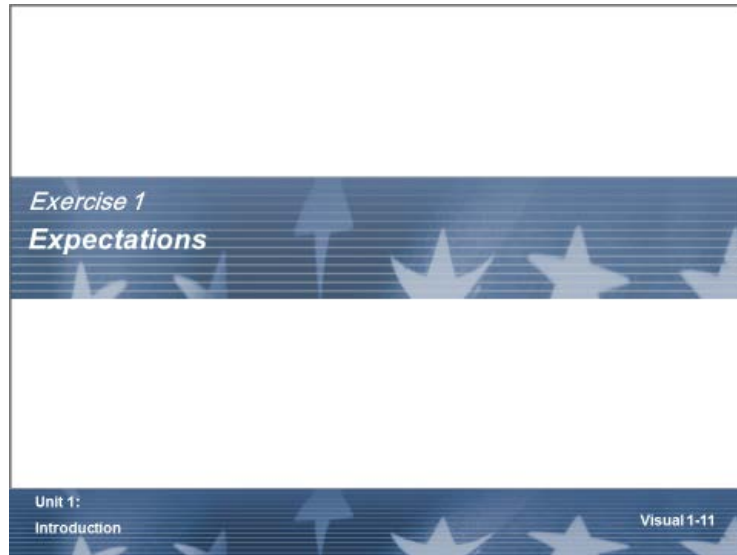
Key Points

Student Introductions

- Name
- Agency
- Title
- Communications experience

Topic

Expectations


**Key Points**

This exercise is scheduled to last approximately 30 minutes. Students will list their expectations on an easel pad. After groups have completed their lists, each group will share their expectations with the rest of the class. The lists are saved so they may be reviewed throughout the course to ensure the course is meeting expectations.

Topic Course Objectives

Course Objectives

- Identify the functions, duties, and responsibilities of the COML
- Arrive at an all-hazards incident properly equipped, gather information to assess the assignment, and begin initial planning
- Plan, staff, manage and demobilize the Communications Unit in a safe and effective manner



Unit 1:
Introduction

Visual 1-12

Key Points

At the completion of this course students will be able to:

- Identify the functions of the Communications Unit and the duties and responsibilities of the COML
- Arrive at an all-hazards incident properly equipped, gather information to assess the assignment, and begin initial planning activities of a COML
- Plan, staff, manage, and demobilize the Communications Unit in a safe and effective manner to meet the needs of the incident

The All-Hazards Communications Unit Leader Course is a 24-hour course designed to meet the training needs of an all-hazards Incident Communications Unit Leader (COML). This COML will be qualified under the training to execute Tactical Interoperable Communications Plans (TICP).

TopicCourse Objectives (cont'd)

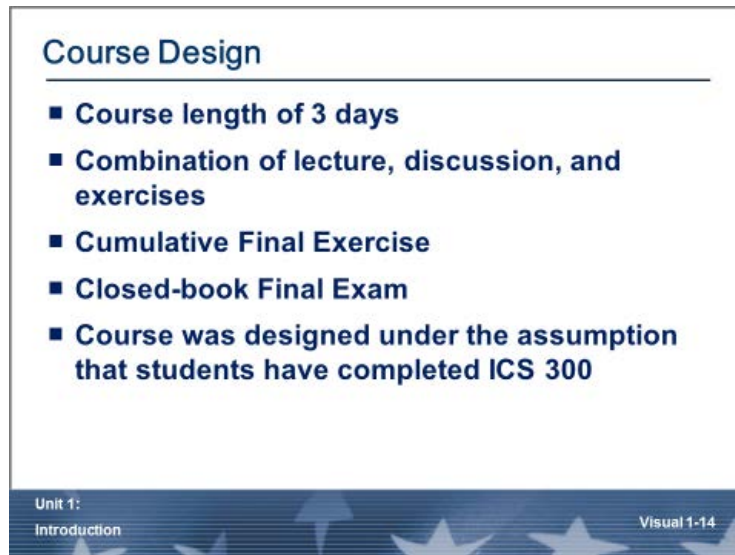
Course Objectives (cont'd)

- **Coordinate with incident sections, communications personnel, and other agencies to accomplish incident objectives**
- **Design, order, and provide for the installation and maintenance of all communications systems**
- **Maintain accountability of assigned personnel and communications equipment**
- **Developed to qualify the COML to execute Tactical Interoperable Communications Plans (TICPs) and other regional communications plans**

Unit 1:
Introduction

Visual 1-13

Key Points



Key Points

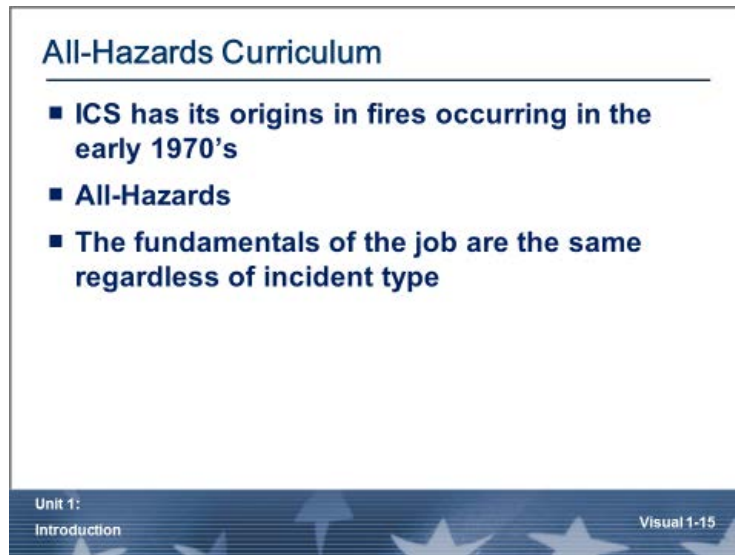
The course has been designed to be three (3) days in length. Through a combination of lecture, discussion, and exercises, students, upon course completion, will be provided the knowledge to meet the objectives of the course. Student interaction and participation will be integral to this process.

Students are required to successfully complete a closed-book Final Exam in order to obtain a certificate of completion.

- 70% or higher will be required to pass
- Final Exam questions will be based on the Unit Enabling Objectives

The course was designed under the assumption that students would have completed ICS 300. The course material was not developed to substantively delve into the topics covered in those courses; rather, this is a position-specific course focusing on the duties and responsibilities of a COML in an all-hazards context.

Topic All-Hazards Curriculum

**Key Points**

Before the 9/11 attacks, ICS was exercised nearly exclusively on fire-based incidents. Recognizing the applicability and sincere need for ICS principles across incident-response disciplines, FEMA has embraced an All-Hazards approach to incident response and management.

As ICS and IMTs transition from a fire-specific context, it will be important to remember where the concepts originated.

Given our personal incident experiences, each of us, instructors included, have a limited perspective (by no means All-Hazards). In other words, all our personal stories and examples will most likely come from the one discipline with which we have worked most. Hopefully, however, after this activity (and also through the introductions), it has been demonstrated that there is a diverse set of experience and knowledge in the classroom.

A COML needs to fundamentally possess the same core knowledge, skills, and abilities whether they are responding to a fire, an oil spill, a mass-casualty incident, etc. In other words, regardless of the hazard, discipline, or incident, the essential job of a COML is the same.

Topic Pre-Planning Activities

Pre-Planning Activities

FAMILY

Preparation is required for your family before you mobilize:


- Prepare family disaster plan so your family will be safe
- Home emergency supplies - water, food, first aid kit, flashlight, medications/prescriptions
- Evacuation – Routes and Locations
- Go Bag/Survival Kit - Ready on short notice
- POC (out of state) & phone number to notify & update status

Unit 1:
Introduction

Visual 1-16

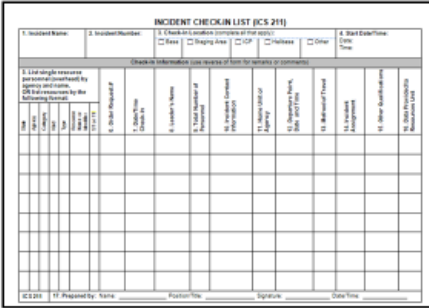
Key Points

ICS Forms 211 and 214



**ICS Form 214:
Activity Log**

ICS Form 211: Check-In List




ICS Form 211: Incident Check-In List

Unit 1: Introduction Visual 1-17

Key Points

Objectives Review

1. *What is the course objective?*
2. *What is the purpose of ICS?*



Unit 1:
Introduction

Visual 1-18

Key Points

Unit Terminal Objective

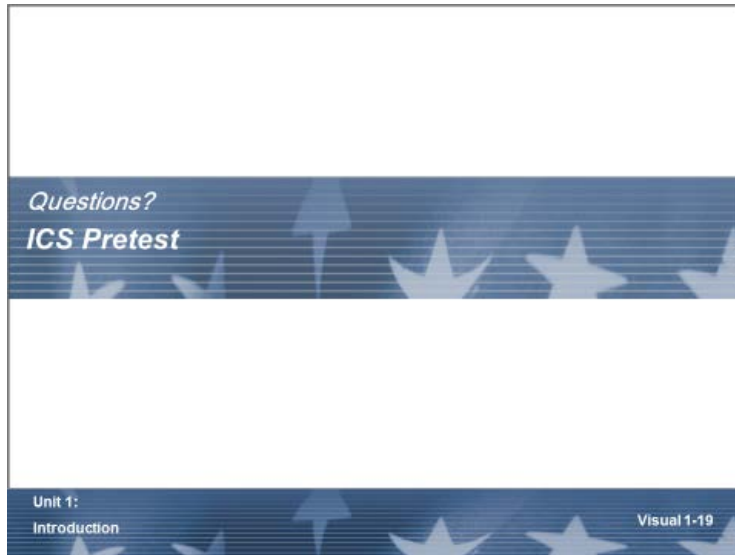
At the end of this unit, the student will be able to identify course objectives and position-specific resource materials for the position of COML.

Unit Enabling Objectives

- Describe the course objectives
- Demonstrate knowledge of the Incident Command System (ICS)

Topic

Questions



Key Points

Unit 2: Overview of the Incident Command System

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Describe the function and components of the Logistics Section and the Communications Unit within the context of the Incident Command System (ICS)
- Describe the actions and considerations necessary to mobilize for an incident and gain situational awareness
- Define the purpose of the Logistics Section
- Describe the Logistics Section positions and their functions
- Describe the responsibilities of the Communications Unit
- Identify and explain common responsibilities of ICS personnel and unit leaders
- Identify responsibilities of the Communications Unit Leader
- Identify Communications Unit Leader incident information sources
- Identify and describe necessary actions to ensure readiness for assignment
- Describe the information gathered from the initial meetings, briefings, and documents

Methodology

The purpose of this unit is to provide students with a high-level orientation to the Logistics Section, the Communications Unit, and the Communications Unit Leader functions. The purpose of this unit is to provide students with an understanding of the requirements of preparing for an incident, an idea of the atmosphere they will have to operate in, and how to adapt to unique circumstances yet still acquire all the necessary information to do their job. The focus should not be on a hard-and-fast process upon arrival, but rather using one's judgment to act as efficiently as possible. Except as provided, note that the Communications Unit Leader's specific functions are described at length elsewhere in the course and should not be expounded upon at any great length at this time. Rather, this unit should set the context for the rest of the course and provide a framework for students related to ICS.

This unit uses lecture, discussion based activities, and exercises.

The purpose of Exercise 2 is to provide the participants with an opportunity to accurately complete an ICS Form 201 requesting all of the appropriate information during the initial Logistics Section Chief briefing. This exercise is scheduled to last approximately 30 minutes, including review with the instructor.

Knowledge of unit content will be evaluated through administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of Exercise 2.

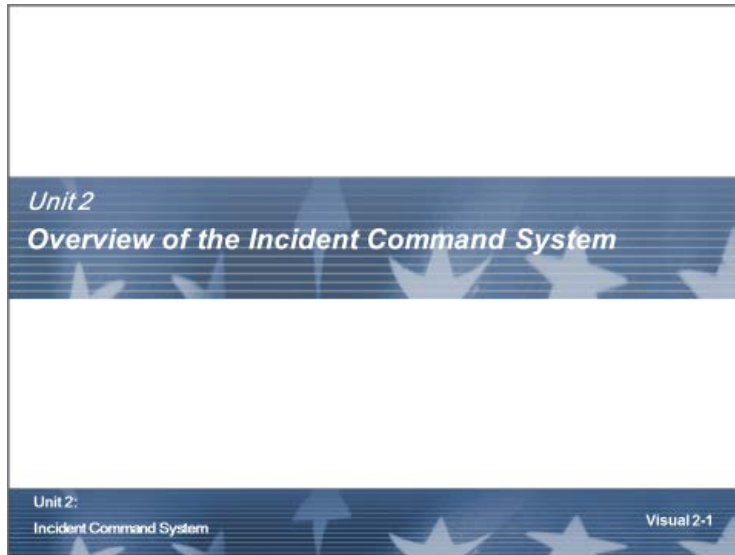
Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	1 hour
Exercise 2	30 minutes
Total Time	1 hour, 30 minutes

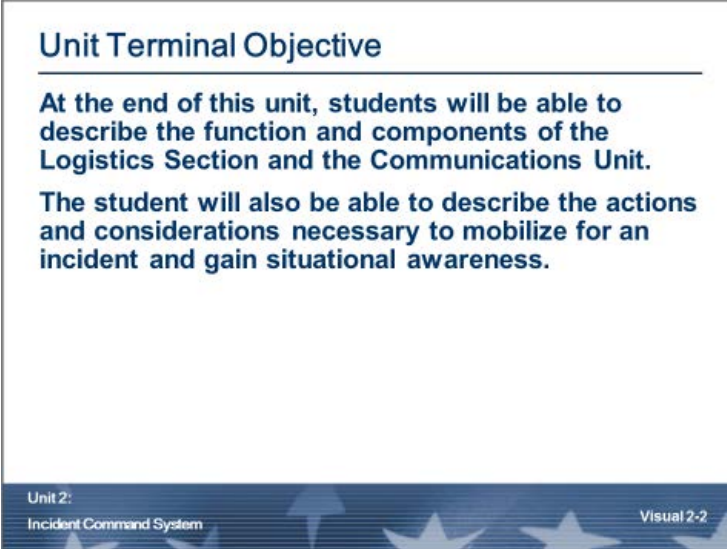
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective



Unit Terminal Objective

At the end of this unit, students will be able to describe the function and components of the Logistics Section and the Communications Unit.

The student will also be able to describe the actions and considerations necessary to mobilize for an incident and gain situational awareness.

Unit 2:
Incident Command System

Visual 2-2

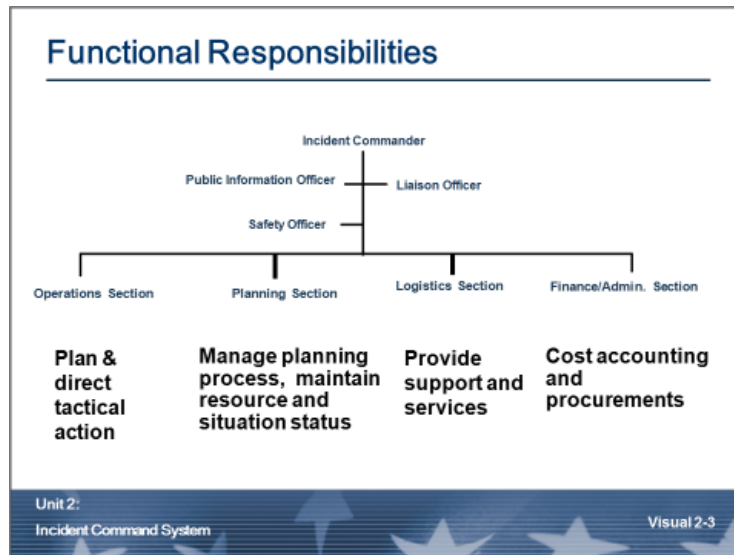
Key Points

Unit Terminal Objectives

- At the end of this unit, students will be able to describe the function and components of the Logistics Section and the Communications Unit
- The student will also be able to describe the actions and considerations necessary to mobilize for an incident and gain situational awareness

Unit Enabling Objectives

- Define the purpose of the Logistics Section
- Describe the Logistics Section positions and their functions
- Describe the responsibilities of the Communications Unit
- Identify and explain common responsibilities of ICS personnel and unit leaders
- Identify responsibilities of the Communications Unit Leader
- Identify Communications Unit Leader incident information sources
- Identify and describe necessary actions to ensure readiness for assignment
- Describe the information gathered from the initial meetings, briefings, and documents

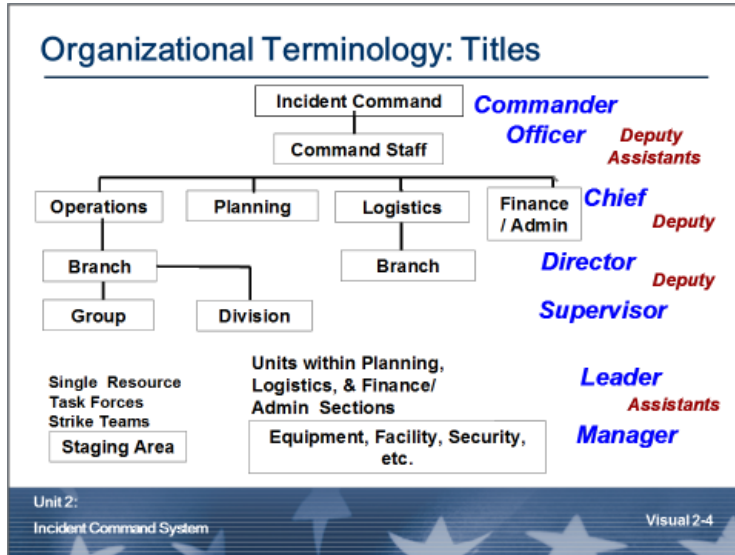
Topic Functional Responsibilities**Key Points**

ICS is a system for organizing and managing the response to an incident that has 30+ years of proven success.

Federal doctrine and requirements:

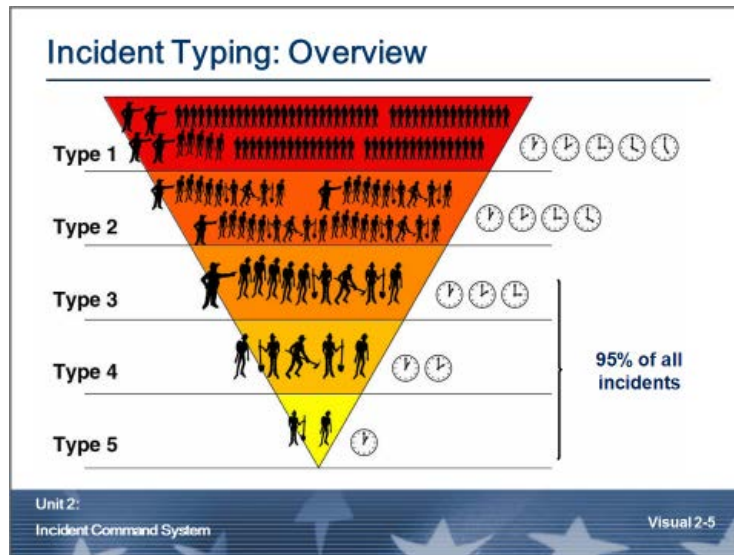
- Homeland Security Presidential Directive Five (HSPD-5) and Eight (HSPD-8)
- National Response Framework (NRF)
- National Incident Management System (NIMS)

Topic Organizational Terminology: Titles

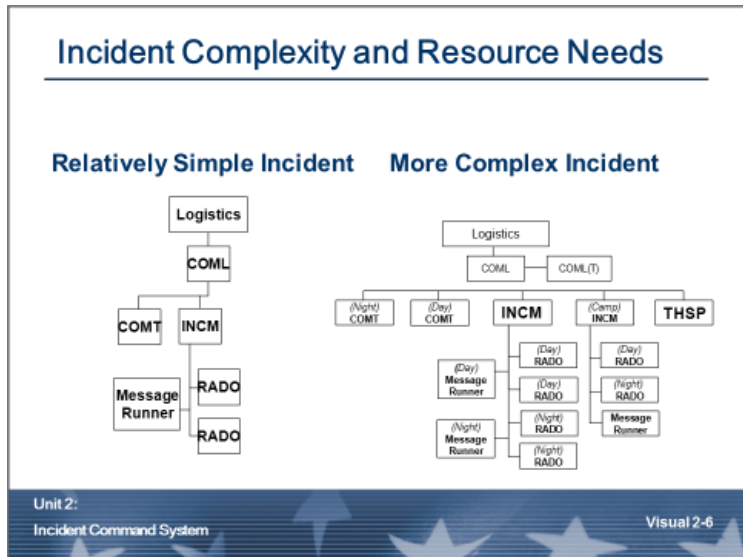


Key Points

Topic Incident Typing: Overview

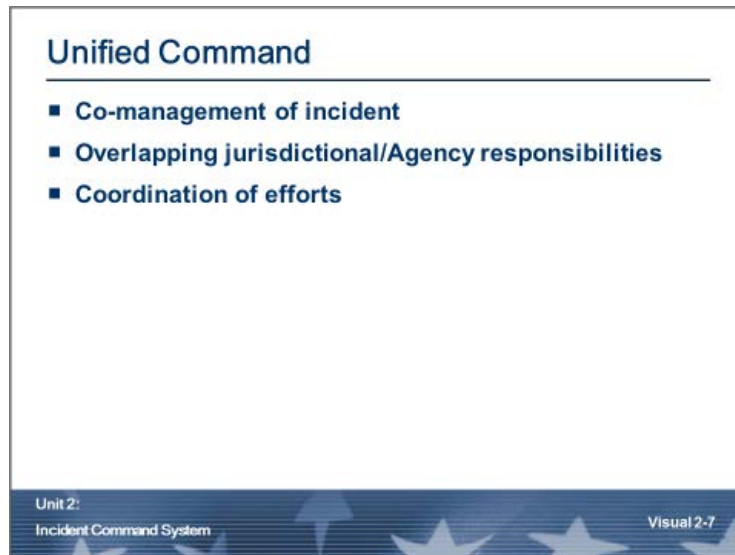
**Key Points**

In this illustration the clocks are indicative of operational periods associated with the various types of incidents. The number and types of figures are indicative of the incident complexity and size of response.



Key Points

Topic Unified Command

**Key Points**

Unified Command: Some people will have trouble with this concept (calling it management by committee). Someone in the group always has 51% of the vote, but it is much better if they don't need to use that hammer. Besides, what would be better? All IC's talking together and merging their organizations, or "cylinders of excellence" with duplications in different organizations set up next to each other? All ICs talking and merging their organizations, or "cylinders of excellence" with duplications in different organizations set up next to each other?

Features of a Unified Command Organization: "Co-located facilities" means SAME facilities; it does NOT mean police and fire trailers parked next to each other.

Unified Command Inclusion: An individual's inclusion in a Unified Command depends on BOTH the responsibility of that agency, AND whether that particular member has the authority to speak for and commit the agency to a course of action. It may be right agency, wrong individual.

Topic Clear Separation of Positions

Clear Separation of Positions

Reasons not to combine organization units

- Can cause staffing confusion later if positions separate
- Creates a non-standard organization



Combining Operations & Logistics Section Chief



Operations Section Chief



Logistics Section Chief

Unit 2:
Incident Command System

Visual 2-8

Key Points

Topic Common Responsibilities

Common Responsibilities

- ALL ICS personnel share certain common responsibilities
- Unit Leaders have additional common responsibilities

Handout 2-1: Unit Leader Common Responsibilities
Handout 2-2: IMTs



Unit 2:
Incident Command System

Visual 2-9

Key Points

While the Communications Unit Leader has responsibilities specific to his/her unit, all ICS personnel also share a common set of responsibilities. Handouts 2-1 and 2-2 provide an introduction to serving on an incident management team, which includes a description of basic responsibilities such as:

- Receiving an assignment from your agency
- Checking-in upon arrival at the incident
- Receiving briefings from an immediate supervisor
- Acquiring work materials
- Conducting all tasks in a manner that ensures the safety and welfare of you and your co-workers
- Organizing and briefing supervisors
- Knowing the assigned frequencies and ensuring communications equipment is operating properly
- Using clear text and ICS terminology (no codes) in all radio communications
- Completing forms and reports required of the assigned positions and send through supervisor to the Documentation Unit
- Responding to demobilization orders and brief subordinates regarding demobilization

In addition, unit leaders have an additional, specific set of common responsibilities, which are detailed in Handout 2-1. These include:

- Participating in incident planning meetings as required
- Determining current status of unit activities
- Confirming dispatch and estimated time of arrival of staff and supplies
- Assigning specific duties to fill and supervise staff
- Developing and implementing accountability, safety, and security measures for personnel and resources
- Supervising demobilization of unit, including storage of supplies;
- Providing the Supply Unit Leader with a list of supplies to be replenished
- Maintain unit records, including an ICS Form 214 – Activity Log

Topic Common ICS Forms

Common ICS Forms

Reference:

- ICS Form 201: Incident Briefing
- ICS Form 205: Communications Plan
- ICS Form 211: Incident Check In List
- ICS Form 213: General Message Form
- ICS Form 214: Activity Log
- Form 217A: Radio Frequency Assignment Worksheet
- ICS Form 225: Incident Personnel Performance Rating

Handout 2-3: Sample ICS Form 213s

Unit 2:
Incident Command System

Visual 2-10

Key Points

Turn to the Forms Section of the Student Guide to review each form

While there are ICS forms that are common to all ICS personnel and unit leaders there are forms that are specific to the responsibilities of the Communications Unit Leader. As the course progresses these forms will be the focus of other activities and exercises.

Common ICS Forms

ICS Form 201: Provides basic information regarding the incident situation and the resources allocated to the incident. It also serves as a permanent record of the initial response to the incident.

ICS Form 211: Personnel and equipment arriving at the incident can check in at various incident locations. Check-in consists of reporting specific information which is recorded on the Check-In List.

ICS Form 213: The General Message Form is used to record incoming messages which cannot be orally transmitted; to transmit messages to the ICC for transmission via radio or telephone and for sending any message or notification to incident personnel which requires hard-copy delivery.

ICS Form 214: The Activity Log is used to record details of unit activity including strike team activity. The file of these logs provides a basic reference from which to extract information for inclusion in any after-action report.

ICS Form 225: The Incident Personnel Performance Rating Form provides agency management with a record of the performance of personnel assigned to ICS positions as evaluated by immediate supervision.

Communications Unit Leader ICS Forms

ICS Form 205: The Incident Radio Communications Plan provides in one location information on all radio frequency assignments for each operational period. The plan is a summary of information obtained from the ICS Form 217A.

Information from the ICS Form 205 on frequency assignments is normally placed on the appropriate Assignment List (ICS Form 204).


Form 217A: The Radio Frequency Assignment Worksheet is used by the Communications Unit Leader to assist in determining frequency allocations.

In the Supplemental Materials Section of Unit 2 you will find sample ICS 213 Forms.

Topic Purpose of the Logistics Section

Purpose of the Logistics Section

The Logistics Section ensures that incident personnel have the equipment, supplies, transportation, rest, and nutrition they need to meet incident objectives.



Unit 2:
Incident Command System

Visual 2-11

Key Points

The mission of the Logistics Section is to ensure incident personnel have the equipment, supplies, transportation, rest, and nutrition they need to meet incident objectives.

The vision of the Logistics Section is to function as a well-honed team that supports personnel to meet incident objectives in a safe, efficient manner.

The goal of the Logistics Section is to be transparent to the rest of the IMT.

Logistics support should be provided in a timely, courteous way. Challenges should be handled in a professional, businesslike manner.

In the Logistics Section, anticipation is your mindset. In order to provide facilities, services, and supplies in support of the incident, the Logistics Section is composed of six units that support and perform specific functions.

Topic Major Responsibilities: Logistics Section Chief



Key Points

Facilities Unit

- Provides incident personnel with incident facilities
- Determines requirements for facilities
- Secures facilities and provides layouts
- Supervises security manager and base/camp manager

Ground Support

- Provide and maintain transportation for personnel, supplies, equipment, and food
- Develops and implements the Traffic Plan
- Arranges and supports fueling, repair, and maintenance of ground resources
- Maintains records and inventory of support and transportation vehicles
- Maintains incident roads

Medical Unit

- Responsible for preparing the Medical Plan, obtaining medical aid and transportation, and preparing medical documentation
- Participates in the Planning Meeting
- Responds to requests for medical aid
- Ensures rehabilitation of incident personnel

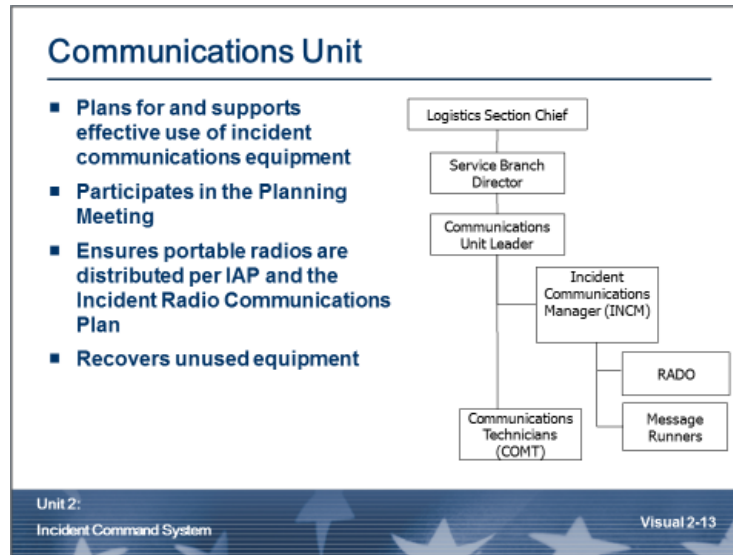
Food Unit

- Responsible for ensuring all incident personnel are adequately fed and hydrated
- Supervises assigned personnel/contracts
- Determines food and water requirements
- Determines best method of feeding
- Orders food and water
- Ensures health and safety measures

Supply Unit

- Support responders with supplies, equipment, and personnel necessary to accomplish the incident objectives
- Participates in logistics planning meetings
- Orders, receives, distributes, and stores supplies and equipment
- Maintains inventory
- Orders or returns supplies
- Services reusable equipment

Topic Communications Unit

**Key Points**

The purpose of the Communications Unit is to plan for and support the effective use of incident communications equipment and facilities. All forms of communication (e.g. faxes, phones, cells, radio) are the responsibility of the Communications Unit.

Functions of the Communication Unit include:

- Installing, distributing, testing, and repairing all communications equipment used during the incident
- Obtaining and disseminating:
 - Equipment assignments
 - Frequency assignments
 - Status of orders
 - Adjacent incident information
 - Equipment availability
- Prepares and implements the ICS Form 205 - Incident Radio Communications Plan
- Establishes appropriate communications with distribution/maintenance locations
- Ensures communications systems are installed and tested
- Ensures an equipment accountability system is established
- Ensures that personal portable radio equipment from the cache is distributed per the ICS Form 205
- Provides technical information as required on:

- Adequacy of communications systems currently in operation
- Geographic limitations on communications systems
- Equipment capabilities/limitations
- Amount and types of equipment available
- Anticipated problems in the use of communications equipment
- Recovers equipment from units being demobilized
- Maintains ICS Form 214 – Activity Log

Often it is helpful for the Communications Unit Leader to attend the pre-planning meeting to learn about upcoming needs and resource limitations.

Topic Operational Period

Operational Period

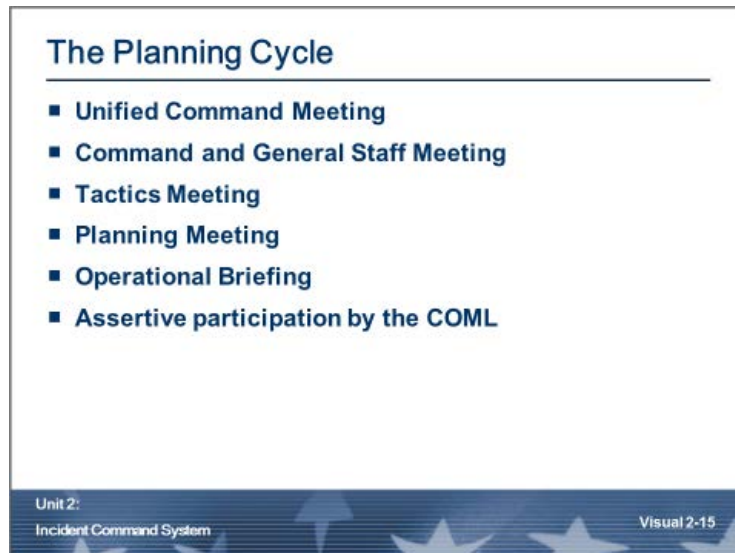
- Time to complete a set of actions from Incident Action Plan
- Determined by Incident Commander
- Usually 12 - 24 hour period
 - 12 hr: 0600 – 1800
 - 24 hr: 0600 – 0600
- Note: Operational Period and shift length may be different

Unit 2:
Incident Command System

Visual 2-14

Key Points

Topic The Planning Cycle

**Key Points**

The Planning Meeting is when the Incident Action Plan is developed for the next operational period.

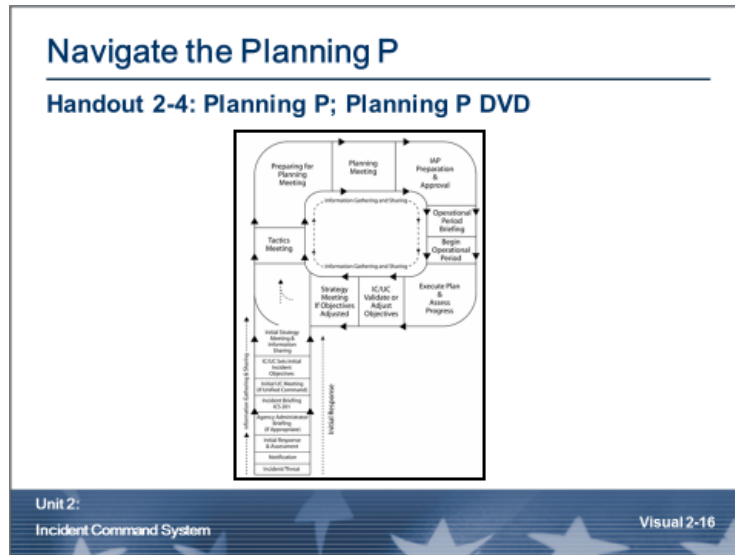
The Operations Meeting is when the Incident Action Plan is briefed.

The Tactics Meeting is when the tactics developed by the Operations Section Chief are reviewed.

These meetings require assertive participation by the Communications Unit Leader. The Communications Unit Leader is not considered a member of the Command or General Staff; however, they do participate in the planning and operational meetings. The Communications Unit may not be able to support the Incident Action Plan due to equipment, radio coverage, or other constraints that may be technical in nature. Still, the Communications Unit Leader needs to be vocal and advise the Command and General Staff of the ability or inability of the Communications Unit to support the plan.

Occasionally attempts are made to make changes in assignments or locations during the Operations meeting. The Communications Unit Leader has to be on top of this and determine in a timely manner if the changes can be supported.

Topic Navigate the Planning P



Key Points

The Planning Cycle requires completing of five major items:

- Tactics Meeting
- Planning Meeting
- Incident Action Plan
- Operational Briefing
- ICS Form 209 - Incident Status Report

Topic Obtain Incident Information

Obtain Incident Information

<ul style="list-style-type: none"> ■ Face-to-face with command and general staff ■ Incident Briefing Form (ICS Form 201) ■ From the Incident Action Plan 	<ul style="list-style-type: none"> ■ Briefing Checklist Includes: <ul style="list-style-type: none"> ■ Situation ■ Communications ■ Risk management ■ Mission/execution ■ Service/support ■ Additional information
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



Unit 2:
Incident Command System
Visual 2-17

Key Points

From what sources is information obtained?

- Face to Face
- Incident Briefing Form
- The Incident Action Plan (IAP)

As a Communications Unit Leader, you may be on the scene to an IAP being set up. Planning may have not occurred yet or an IAP may not be available.

Logistics Section Chief Briefing Information


- Situation-current and expected:
 - Operational plan (branches, groups, divisions, air operations)
 - Expected duration of assignment/incident
 - Other agencies involved
 - Operational/logistical resources ordered and/or en route
 - ICS Form 201, ICS Form 209, or IAP if available
- Mission/Execution:
 - Transition (incident transfer of command)
 - Length of Operational period
 - Policies and operating procedures
 - Meeting schedules

- Incident Scene Access
- Communications:
 - Special needs (e.g. security)
 - Current frequencies and radio systems in use
 - Issues with local communications systems

Topic Preliminary Documentation

Preliminary Documentation

- ICS Form 201 or IAP
- May be obtained from supervisor
- If not supervisor, whoever is managing the planning function may have copies



Unit 2:
Incident Command System

Visual 2-18

Key Points

Upon arrival at the incident location, procuring information should be a top priority. The ICS Form 201 and the IAP can be used by the COML to glean information in addition to or in place of the LSC Briefing.

Topic Incident Briefing Form (ICS Form 201)

Incident Briefing (ICS Form 201)

- **Purpose:** Provides basic information regarding the incident status situation and resources
- **Source:** Typically prepared by initial IC and obtained from outgoing personnel at the Initial IC's Briefing
- **COML Responsibilities:** Review to familiarize yourself with current status and organization, and with the resources summary

Handout 2-5: Sample Central City Incident Briefing (ICS Form 201)

Unit 2:
Incident Command System
Visual 2-19

Key Points

Purpose: ICS Form 201- Incident Briefing Form provides basic information regarding the incident status situation and resources allocated to the incident. It is also used when the incident transitions from Initial Action to an IMT. Four part form that consists of:

Map - The first page of the ICS Form 201 includes a rendering of the incident map as well as the location of assigned personnel and equipment. The sketch can help a Communications Unit Leader determine the geographic size and topography of the incident. It can also provide information on the scale or complexity of the incident.

Summary of Current Actions - The second page of the ICS Form 201 usually includes a list of incident objectives, a chronological list of current actions taking place on the incident, and significant events.

Current Organization – The third page of the ICS Form 201 provides a chart of the current organizational structure.

Resources Summary - The fourth page of the ICS Form 201 will include a list of personnel and equipment organized by status.

Source: Typically prepared by initial Incident Commander

Communications Unit Leader Responsibilities: This document explains the current status and organization, and contains a resources summary.

- Obtain incident information from the IAP, ICS Form 201- Incident Briefing Form , or command and general staff interviews
- Obtain current frequencies or talkgroups in use
- Obtain the current and anticipated resource

- Discuss current and anticipated issues
- Obtain expected duration of the incident

Topic Incident Action Plan (IAP)

Incident Action Plan (IAP)

- **Purpose:** Provides information for the current operational period
- **Sources:** Obtained from outgoing personnel at the initial IC's Briefing
- **COML Responsibilities:** Understand the goals and priorities of the incident response effort, determine how many members of each unit have been assigned for resource planning, identify which frequencies have already been assigned.

Unit 2:
Incident Command System

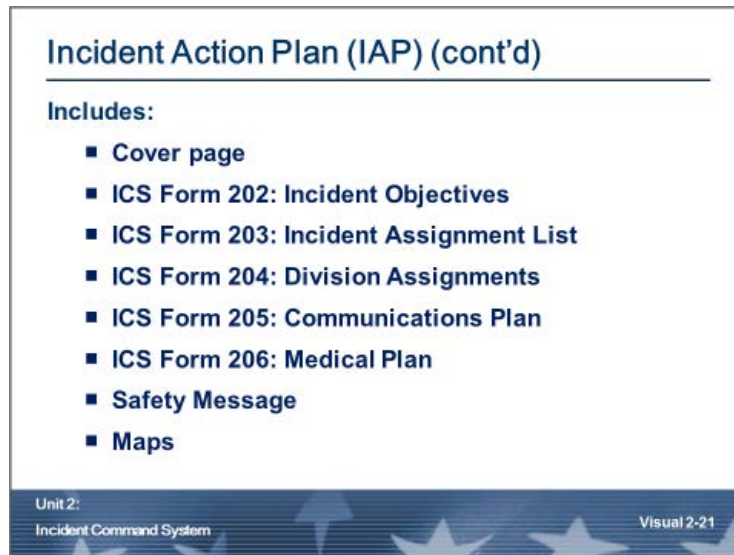
Visual 2-20

Key Points

Purpose: Provides information for the current operational period. It should be available if transitioning from another team.

Sources: Obtain from outgoing personnel at the initial IC's Briefing.

Preparation: Is typically delegated to the Planning Section Chief; however, plan components are the responsibility of individual units.

Topic Incident Action Plan (cont'd)**Key Points**

Communications Unit Leader responsibilities:

- Be familiar with the specific goals of the incident response and their respective priorities - Incident Objectives sheet (ICS Form 202)
- Determine how many members of what units have thus far been assigned to anticipate equipment needs - ICS Form 203 - Organization Assignment List
- Identify the frequencies already assigned to specific units so that the Incident Communications Plan can be constructed around them – ICS Form 204 - Assignment List
- Review and maintain the ICS Form 205 - Incident Radio Communications Plan which provides the major operational and command frequencies for the incident
- Review the ICS Form 206 - Medical Plan, which contains information such as telephone numbers and frequencies that, if not already assigned, the Communications Unit Leader must have input on
- Review the Air Operations Summary (ICS Form 220), which contains the local air frequencies, some of which the Communications Unit Leader must assign, and some of which are assigned by the FAA and cannot be altered
- Review other documents, such as the IMT and Ops Section organizational charts, the safety message and information on the ICP such as traffic patterns and general layout

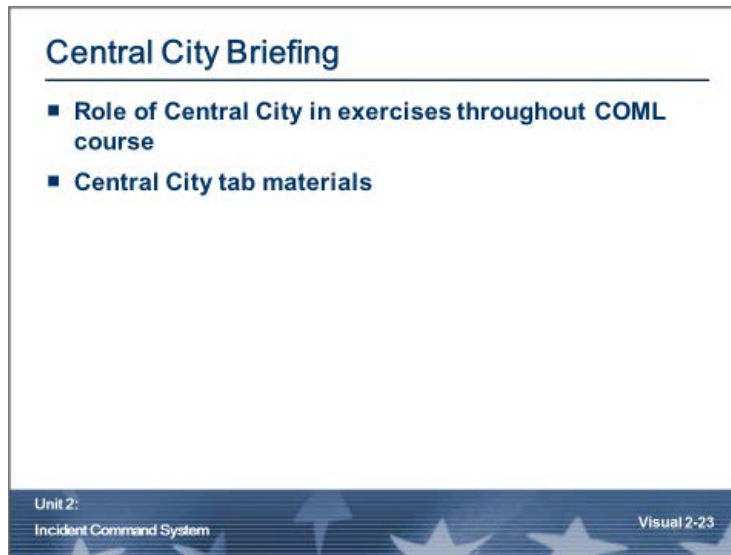
Topic Intra-IMT Coordination

**Key Points**

The Communications Unit Leader must coordinate with:

- Incident Commander (IC): If the incident does not have an Operations Section Chief, the Communications Unit Leader will work primarily with the Incident Commander to coordinate placement of equipment and facilities
 - The IC's incident objectives drive the tactics, which drives the Communications Plan
- Operations Section Chief (OSC): The Operations Section Chief provides numbers and types of work assignments involved with operations
 - He or she provides an estimated amount of radio traffic for each assignment and identifies any existing radio issues
- Planning Section Chief (PSC): The Planning Section Chief provides an IAP development and meeting schedule to the Communications Unit Leader
- Safety Officer (SOFR): The primary coordination with the Safety Officer involves ensuring that communications are safely and fully provided, given the limitations of hardware and software
- Finance/Administration Section Chief (FSC): The Finance Section Chief identifies any spending limitations that may affect the acquisition of communication resources
- Facilities Unit Leader (FACL): The Facilities Unit Leader provides workspace for the Communication Unit
- Supply Unit Leader (SPUL): The Supply Unit Leader orders and receives the communications equipment and personnel for the incident

Topic Central City Briefing

**Key Points**

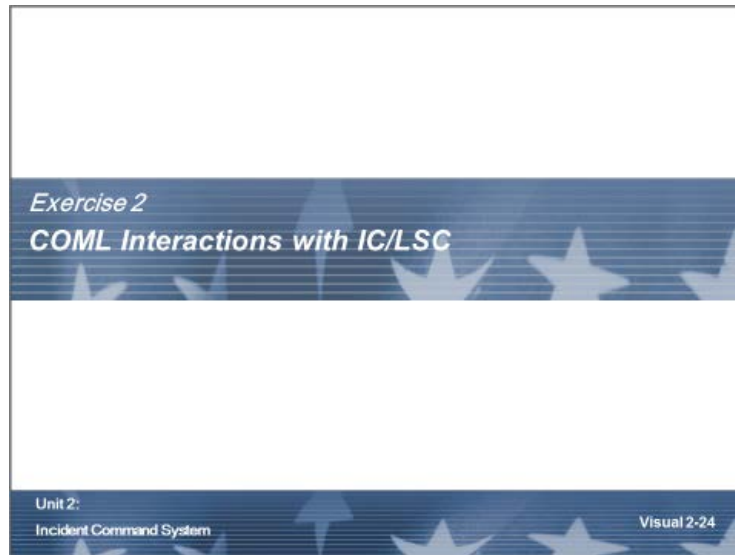
Central City tab is located between Units 2 and 3. It includes:

- Central City Overview
- ICS Form 217A - Communications Resource Availability Form
- Urban Train Derailment Narrative
- Central City Train Derailment IAP

Students will refer to this tab in future exercises.

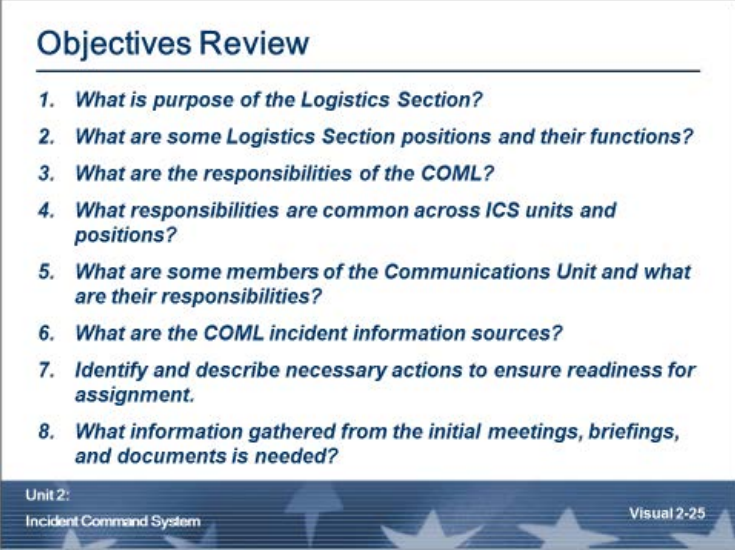
Topic

Exercise 2

**Key Points**

This exercise is scheduled to last approximately 30 minutes, involving the instructor reading from a script involving the train derailment scenario that provides incomplete information and students asking questions at the end. Based on this information the students will then discuss the significance of the information received and what conclusions to draw (students will fill out an ICS Form 201).

Topic Objectives Review

A slide titled "Objectives Review" with a list of eight questions. The slide has a blue header and footer. The footer contains the text "Unit 2: Incident Command System" on the left and "Visual 2-25" on the right.

Objectives Review

1. *What is purpose of the Logistics Section?*
2. *What are some Logistics Section positions and their functions?*
3. *What are the responsibilities of the COML?*
4. *What responsibilities are common across ICS units and positions?*
5. *What are some members of the Communications Unit and what are their responsibilities?*
6. *What are the COML incident information sources?*
7. *Identify and describe necessary actions to ensure readiness for assignment.*
8. *What information gathered from the initial meetings, briefings, and documents is needed?*

Unit 2:
Incident Command System

Visual 2-25

Key Points

Unit Terminal Objectives

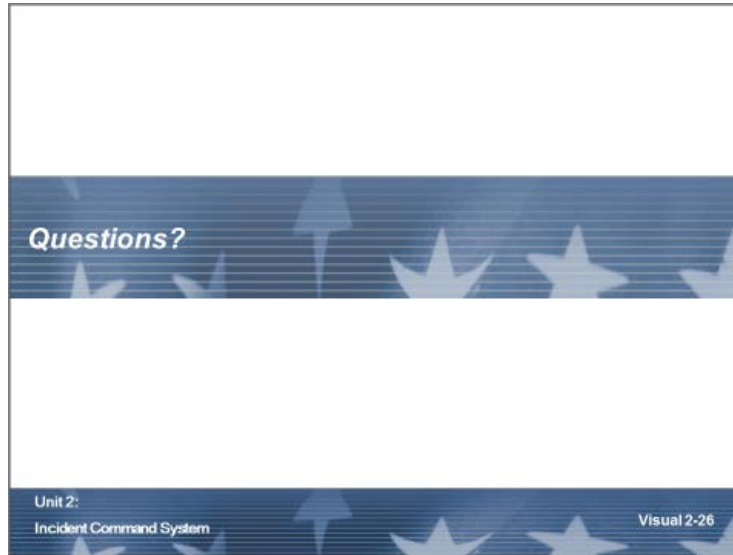
- At the end of this unit, students will be able to describe the function and components of the Logistics Section and the Communications Unit
- The student will also be able to describe the actions and considerations necessary to mobilize for an incident and gain situational awareness

Unit Enabling Objectives

- Define the purpose of the Logistics Section
- Describe the Logistics Section positions and their functions
- Describe the responsibilities of the Communications Unit
- Identify and explain common responsibilities of ICS personnel and unit leaders
- Identify responsibilities of the Communications Unit Leader
- Identify Communications Unit Leader incident information sources
- Identify and describe necessary actions to ensure readiness for assignment
- Describe the information gathered from the initial meetings, briefings, and documents

Topic

Questions?



•

Key Points

Unit 3: The Communications Unit

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Describe the function and components of the Communications Unit and qualification process for the Communications Unit Leader
- Identify positions within the Communications Unit
- Describe responsibilities of positions within the Communications Unit

Methodology

This unit uses lecture and discussion based activities.

Knowledge of unit content will be evaluated through administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of Exercise 3.

The purpose of this unit is to provide students with an orientation to the Communications Unit.

Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	1 hour, 30 minutes
Total Time	1 hour, 30 minutes

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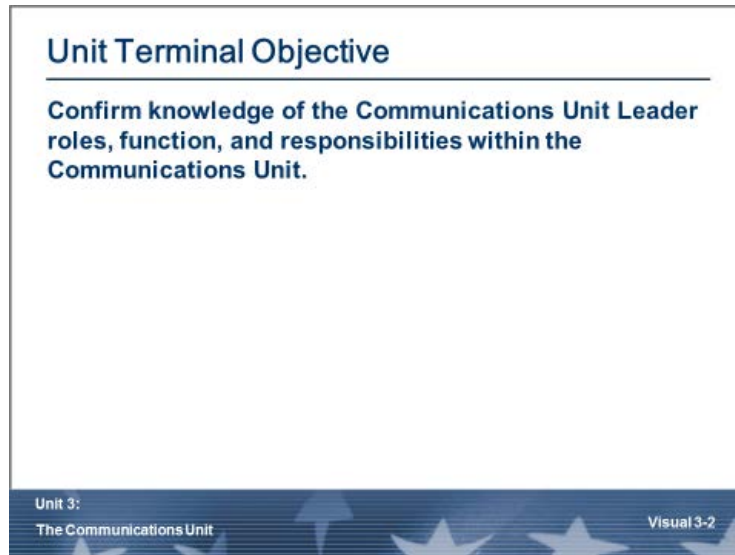
Topic

Unit Title Slide



Key Points

TopicUnit Terminal Objective

**Key Points**

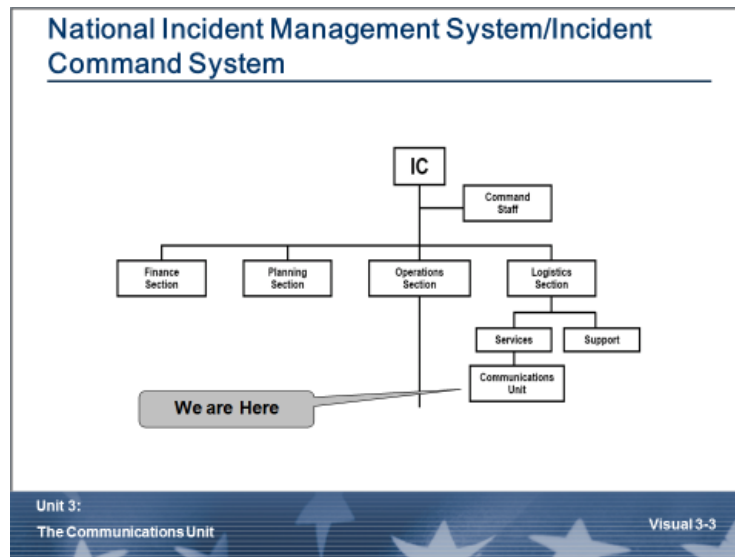
Unit Terminal Objective

At the end of this unit, students will be able to describe the function and components of the Communications Unit.

Unit Enabling Objectives

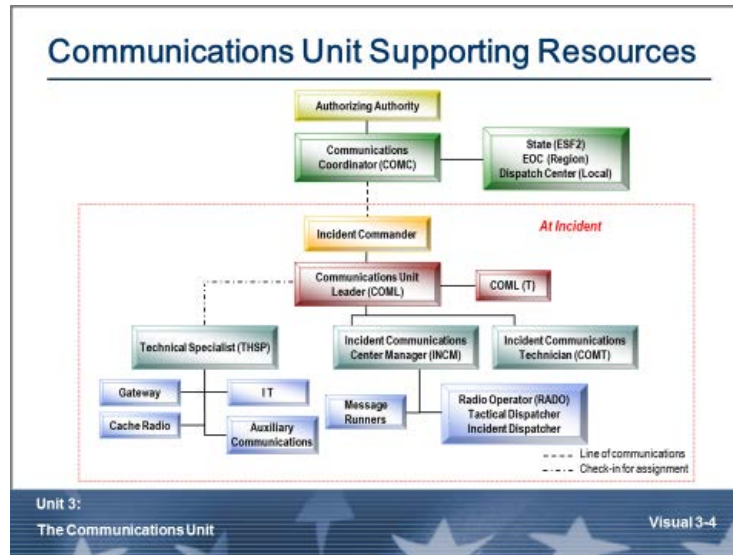
- Identify positions within the Communications Unit
- Describe responsibilities of positions within the Communications Unit

Topic National Incident Management System/Incident Command System



Key Points

Topic Communications Unit Supporting Resources



Key Points

The communications POC/CDO/COMC helps with:

- Equipment assignments
- Frequency assignments (repeaters, links, aircraft, tactical)
- Status of orders (preorders, equipment, when ordered, ETA, etc.)
- Adjacent incident information (interoperability issues, frequency assignments, incident locations, contact information)
- Equipment availability (pre-positioned, cache location, shortages)
- Verifying incident location
- Identifying if communications coordination assistance is available



Key Points

Topic Communications Unit Personnel

**Key Points**

To help fulfill all the responsibilities of the Communications Unit, a fully-staffed Communications Unit will feature a number of personnel in a variety of roles. Not all positions must be used on every incident, but the COML may choose from:

- Incident Communications Technician (COMT)—Installs and troubleshoots communications equipment
- Incident Communications Manager (INCM)—Manages an Incident Communications Center, when having the COML do so would present span-of-control issues
- Radio Operator (RADO)—Staffs the ICC, using radios to receive information and relay messages
- Auxiliary Communications (AUXCOMM)—This unofficial ICS position supports the operational and technical aspects of the AUXCOMM Unit, maintains and/or operates the AUXCOMM network; the knowledge to perform this function applies to every AUXCOMM position
- Technical Specialist—Catch-all term for outside specialists providing expertise to the COML
- Message Runner—Physically relays messages to areas not yet served with any communications system

Topic Communications Unit Leader

Communications Unit Leader

- Plans and manages the technical and operational aspects of the communications function during an incident or event
- Prepares Incident Radio Communications Plan (ICS 205)
- Establishes Incident Communications Center (ICC)
- Orders and manages personnel, equipment
- Establishes needed capabilities
- Participates in incident action planning



Unit 3:
The Communications Unit

Visual 3-7

Key Points

The COML is responsible for a number of tasks, including:

- Planning and managing the technical and operational aspects of the communications function during an incident or event
- Preparing an Incident Radio Communications Plan (ICS Form 205)
- Establishing an Incident Communications Center (ICC)
- Ordering and managing personnel, equipment
- Establishing needed capabilities
- Participating in incident action planning

Topic Communications Unit Leader

Communications Unit Leader (COML)

Duties: As with any ICS position, the COML is responsible for the duties of unfilled subordinate positions (INCM, COMT, THSP, RADO/Tactical Dispatcher) until delegated.



Unit 3:
The Communications Unit

Visual 3-8

Key Points

The COML is responsible for completing the duties of any organizationally subordinate task he or she has not delegated. Even after delegated, the COML maintains responsibility for overseeing the work of his/her subordinates.

When a Unit Leader does not delegate duties, he/she assumes them.

TopicIncident Communications Center Manager (INCM)

Incident Communications Center Manager (INCM)

Duties:

- **Manage the operational aspects of the Communications Unit**
- **Supervise Radio Operators**
- **Assists the COML in establishing and maintaining the Incident Communications Center (ICC)**



Unit 3:
The Communications Unit

Visual 3-9

Key Points

TopicIncident Communications Technician (COMT)

Incident Communications Technician (COMT)

The COMT is responsible for supporting the technical activities of the Communications Unit. For example:

- Radio/system coverage
- Radio programming
- Maintenance and repair
- Gateway management
- Cache management



Unit 3:
The Communications Unit

Visual 3-10

Key Points

Topic Incident Communications Technician (COMT)

Incident Communications Technician (COMT)

Duties: Provides for the technical implementation of incident communications systems:

- Provides for equipment distribution
- Tracks equipment
- Trains users on use of equipment
- Verifies proper programming of equipment for incident
- Assists COML in the development of the ICS 205, Incident Radio Communications Plan

Unit 3:
The Communications Unit

Visual 3-11

Key Points

The COMT is responsible for duties that include:

- Provides for equipment distribution
- Tracks equipment
- Trains users on use of equipment
- Verifies proper programming of equipment for incident
- Assists COML in the development of the ICS Form 205, Incident Radio Communications Plan

Topic Incident Communications Technician

Incident Communications Technician (COMT)

Similarly, an NWCG-qualified COMT is responsible for deploying radio cache assets specifically belonging to the National Interagency Incident Communications Division (NIICD) at the National Interagency Fire Center (NIFC) in Boise, Idaho.



Unit 3:
The Communications Unit

Visual 3-12

Key Points

RADO

A RADO staffs a radio operator's position at the ICC and is responsible for documenting all radio and telephone messages.



Unit 3:
The Communications Unit

Visual 3-13


Key Points

Topic

Incident Dispatchers and Tactical Dispatchers

Incident Dispatchers and Tactical Dispatchers

Some local agencies have trained public safety dispatchers to work in the field at the incident scene as Incident and/or Tactical Dispatchers who can bring additional training and experience to the ICC.



Unit 3:
The Communications Unit

Visual 3-14

Key Points

As part of completing your Mobilization Guide, determine what local resources are available to you. If Incident Dispatch Teams are not available locally, they are available through the Emergency Management Assistance Compact (EMAC). Just like with any resource, you will need to be specific in your request that you want Incident Dispatchers and go through the proper channels.

Topic Technical Specialist (THSP)

Technical Specialists (THSP)

THSP is a “catch-all” position that allows for the formal incorporation of personnel who may not be “qualified” in a specific NIMS/ICS position. For example:

- Information Technology (IT) Specialist
- Local Agency Radio Technicians (not qualified as a COMT)
- Telephone Technicians
- Interoperability Gateway Specialist
- Mobile Communications Center Specialist
- Cache Radio Specialist
- GIS Specialist

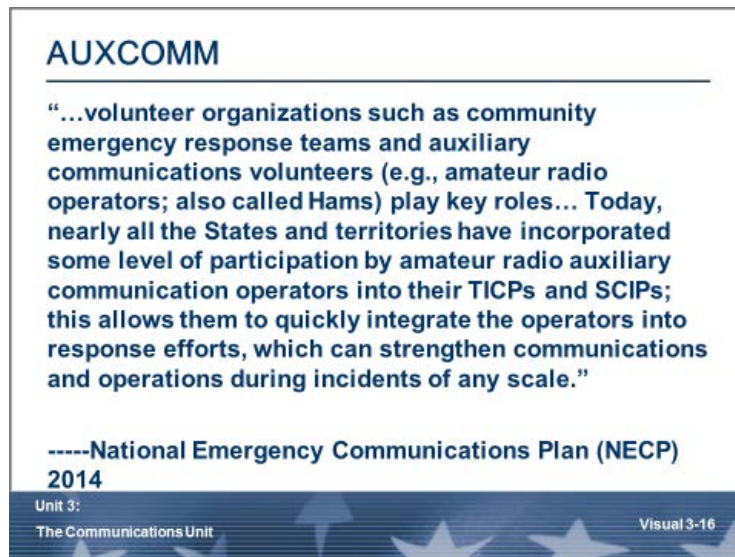


Unit 3:
The Communications Unit

Visual 3-15

Key Points

Any amateur resources need to be trained and they need to be disaster service workers (covers for insurance purposes).

Topic Auxiliary Communications (AUXCOMM)**Key Points**


This unofficial ICS position supports the operational and technical aspects of the Auxiliary Communications Unit, maintains and/or operates the AUXCOMM network. The knowledge to perform this function applies to every AUXCOMM position.

Auxiliary Communicators have been helping with backup emergency communications since before the Titanic sank.

Every state uses AUXCOMM personnel in one way or the another. Some states more than other states.

The new NECP mentions the use of volunteer radio operators more than any edition prior.

AUXCOMM personnel have been used in major events such as the Haiti hurricane, the lost plane from Malaysia, Katrina, Sandy, tornado outbreaks in Missouri and Oklahoma. Use personal examples if you have them.

Topic AUXCOMM (cont'd)

AUXCOMM (Cont'd)

- **Auxiliary Communications**
 - **Integration into incident communications**
 - **Provide alternate communications in cases where local services fail**
 - **Provide auxiliary support to active emergency communications**
 - **Local involvement protocol varies**

Unit 3:
The Communications Unit

Visual 3-17

Key Points

- ARES – Amateur Radio Emergency communications RACES – Radio Amateur Civil Emergency Services
- MARS – Military Auxiliary Radio Service
- Needs to be coordinated by the COML as part of the overall communications strategy
- Integration into incident communications
 - Provide alternate communications in cases where local services fail
 - Provide auxiliary support to active emergency communications
- Local involvement protocol varies
- AUXCOMM classes are available through OEC

Topic AUXCOMM Course

AUXCOMM Course

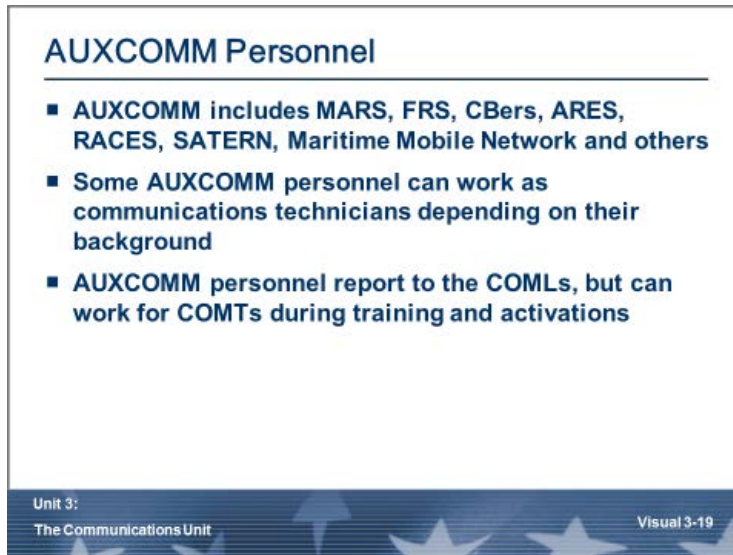
- A course designed to teach volunteer radio operators how to work with the Communications Unit Leader (COML)
- Course also outlines how volunteer communications are used in a NIMS/ICS environment
- Course is 20 hours long (minimum) and can be taught over a weekend or during the week
- Course is taught by experienced COML instructors who have an extensive background in amateur radio

Unit 3:
The Communications Unit

Visual 3-18

Key Points

TopicAUXCOMM Personnel



AUXCOMM Personnel

- **AUXCOMM includes MARS, FRS, CBers, ARES, RACES, SATERN, Maritime Mobile Network and others**
- **Some AUXCOMM personnel can work as communications technicians depending on their background**
- **AUXCOMM personnel report to the COMLs, but can work for COMTs during training and activations**

Unit 3:
The Communications Unit

Visual 3-19

Key Points

Topic AUXCOMM Personnel (cont'd)

AUXCOMM Personnel (cont'd)

- Can operate on voice, digital, satellite, VoIP, RoIP and numerous other modes if they have the right equipment
- AUXCOMM personnel should know exactly what is expected of them prior to them volunteering
- AUXCOMM personnel work directly for the NIMS/ICS organization that they report to when activated

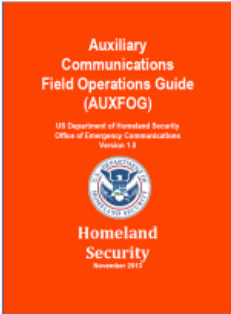
Unit 3:
The Communications Unit

Visual 3-20

Key Points

AUXFOG

- The DHS Auxiliary Field Operations Guide (AUXFOG) was released by OEC in 2013.
- It can be downloaded from the OEC Public Safety Tools website at www.publicsafetytools.info



Unit 3:
The Communications Unit

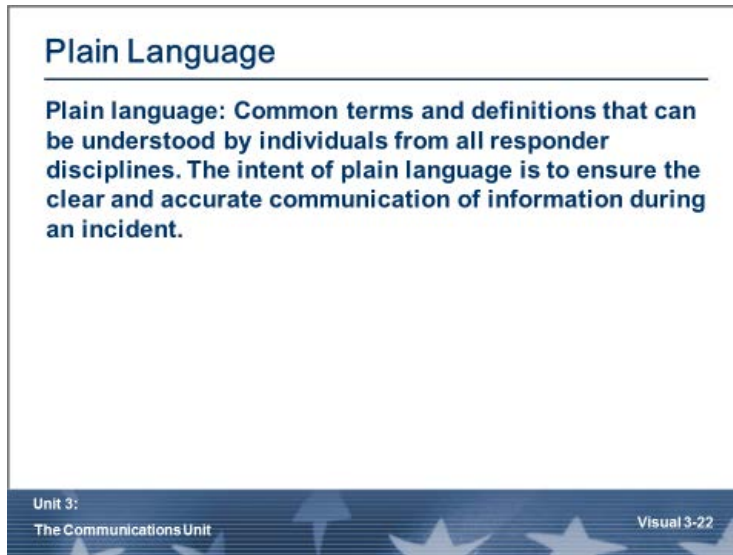
Visual 3-21

Key Points

Auxiliary Field Operations Guide (AUXFOG)

The FOG was authored specifically for AUXCOMM people, but COMLs and COMTs have been known to use this as well.

TopicPlain Language

**Key Points**

TopicCommon Terminology

Common Terminology

Common Terminology

- Is an ICS wide fundamental
- Necessary for operations, planning, and standard operating procedures (SOPs)
- A common dialect for describing the “who, what, when, where, why, and how” of operations
- Common terminology requires a standardized dictionary of terms and terminology

Unit 3:
The Communications Unit

Visual 3-23

Key Points

Topic Common Terminology (cont'd)

Common Terminology

ICS establishes common terminology that allows diverse incident management and support organizations to work together across a wide variety of incident management functions and hazard scenarios.

A photograph showing a person in a dark suit and glasses looking at a tablet computer. The person is seated at a desk with papers and a laptop. The background is slightly blurred, showing an office or control room environment.

Unit 3:
The Communications Unit

Visual 3-24

Key Points**Organizational Functions**

Major functions and functional units with incident management responsibilities are named and defined. Terminology for the organizational elements is standard and consistent.

Resource Descriptions

Major resources—including personnel, facilities, and major equipment and supply items—that support incident management activities are given common names and are “typed” with respect to their capabilities, to help avoid confusion and to enhance interoperability.

Incident Facilities

Common terminology is used to designate the facilities in the vicinity of the incident area that will be used during the course of the incident.

Technology solutions by themselves are not sufficient to fully address communication interoperability problems in a given local government, state, or multi-state region. State and local officials consider a standard database of interoperable communications frequencies to be essential to frequency planning and coordination for interoperability frequencies and for general public safety purposes. Police and fire departments often have different concepts and doctrines on how to operate an incident command post and use interoperable communications. Similarly, first responders, such as police and fire departments, may use different terminology to describe the same thing. Differences in terminology and operating procedures can lead to communications problems even where the participating public safety agencies share common communications equipment and spectrum. State and local officials have drawn specific attention to

problems caused by the lack of common terminology in naming the same interoperability frequency (GAO 04-1057T pg. 9).

Topic Common Terminology (cont'd)

Common Terminology (cont'd)

Not all Common Terminology has the same meaning. For example, the term “cover” has several meanings.

- If you told a fire fighter to cover they would take their fire engine and go to another station
- If you told a police officer to cover they would back up another officer
- If you told a Marine to cover they would lay down 50 cal. suppressive gun fire

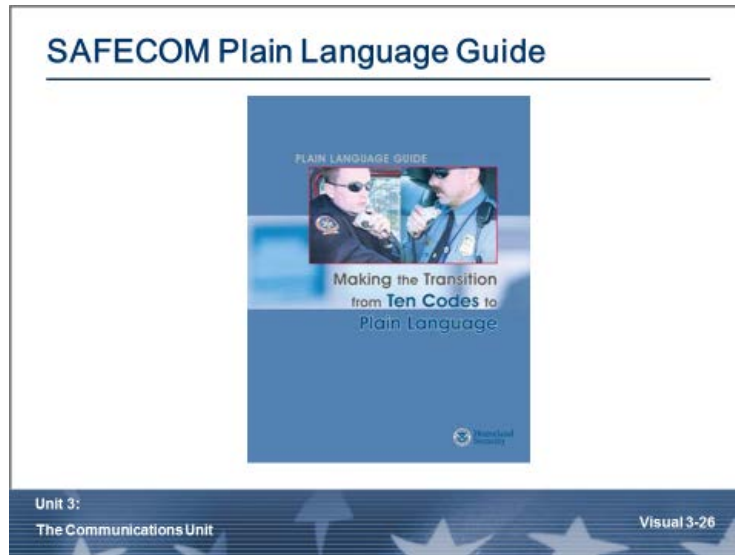
Unit 3:
The Communications Unit

Visual 3-25

Key Points

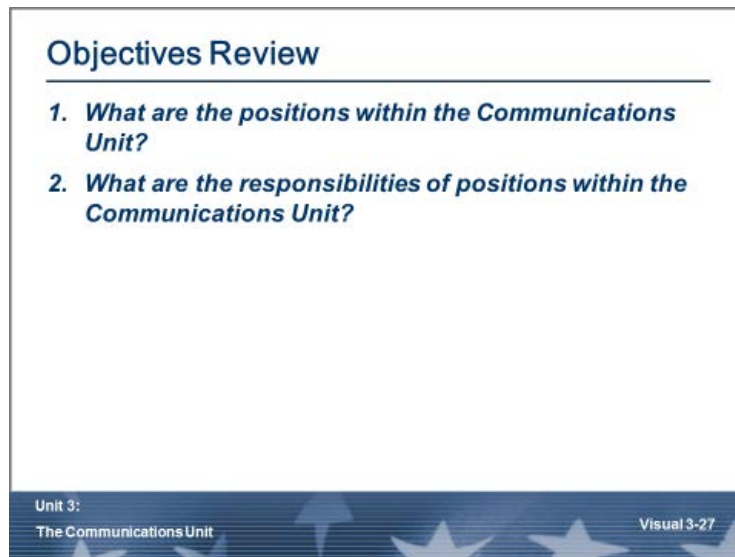
Topic

SAFECOM Plain Language Guide



Key Points

Topic Objectives Review



Key Points

Unit Terminal Objective

At the end of this unit, students will be able to describe the function and components of the Communications Unit.

Unit Enabling Objectives

- Identify positions within the Communications Unit
- Describe responsibilities of positions within the Communications Unit

Topic

Questions



Key Points

Unit 4: Interoperable Communications

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Identify methods for the application, coordination, and use of interoperable communications
- Define the concept of interoperability
- Identify and describe the five lanes of the SAFECOM Interoperability Continuum

Methodology

This unit uses lecture and discussion based activities.

Knowledge of unit content will be evaluated through administration of the final exam (to be administered upon completion of the course).

The purpose of this unit is to provide students with a high-level orientation to interoperable communications.

The purpose of Exercise 4-1 is to provide the participants with an opportunity to develop deployment strategies for portable repeaters in all-hazards environments, explain the challenges their strategy overcomes, and identify any challenges created by their strategy.

The purpose of Exercise 4-2 is to provide the participants with an opportunity to identify the challenges specific to communications in certain all-hazards environments and explain how to use existing communications technology to overcome these challenges.

Knowledge of unit content will be evaluated through administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of Exercises 4-1 and 4-2.

Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	2 hours
Exercise 4-1	30 minutes
Exercise 4-2	30 minutes
Total Time	3 hours

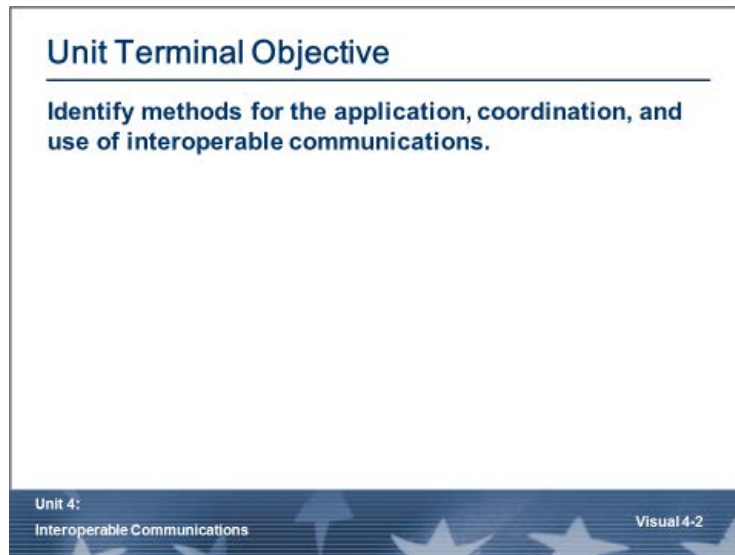
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TopicUnit Title Slide

**Key Points**

This unit is designed to give the student a broad overview of various considerations that the Communications Unit Leader must keep in mind in relation to the SAFECOM Interoperability Continuum as it provides an understanding of the processes utilized in the urban environment to achieve interoperable communications.

Topic Unit Terminal Objective



Key Points

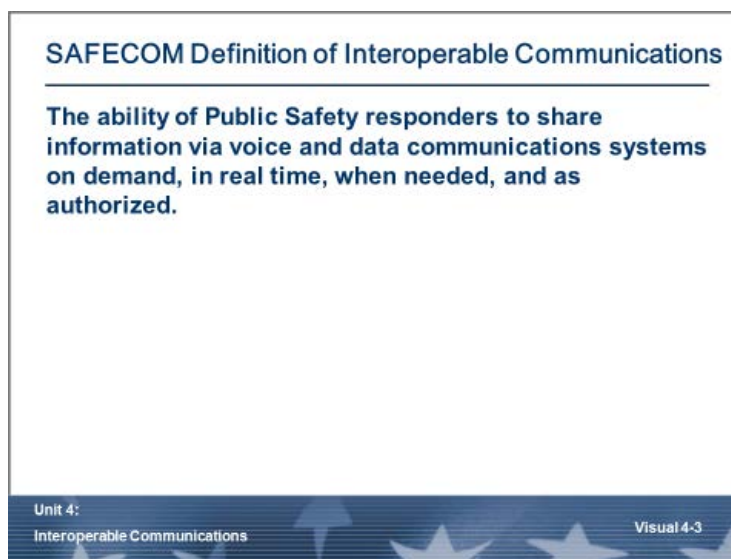
Unit Terminal Objective

Identify methods for the application, coordination, and use of interoperable communications.

Unit Enabling Objectives

- Define the concept of interoperability
- Identify and describe the five lanes of the SAFECOM Interoperability Continuum

Topic SAFECOM Definition of Interoperable Communication

**Key Points**

The purpose of this slide is to clarify the concept of interoperability in communications.

The Interoperability Continuum, and the interoperability concept, can be misunderstood quite easily. Interoperability must be carefully managed to avoid mass confusion. The Communications Unit Leader's job is specifically to prevent confusion in communication.

Interoperability does not require allowing all radio users to speak to all other radio users, which would create mass confusion. Rather, it refers to systems and processes that allow parties to communicate even if their equipment differs.

Interoperability is not the creation of a "party line."

Interoperable systems can grow quickly in complexity and are therefore easy to overload.

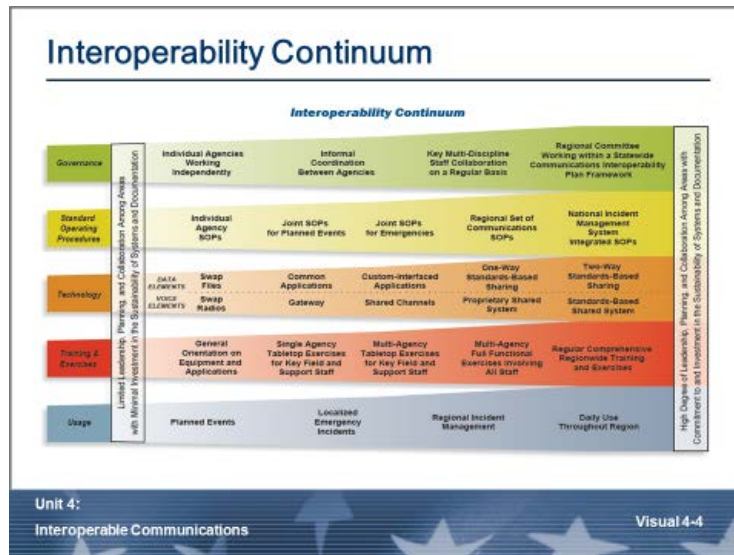
National Emergency Communications Plan (NECP)

The NECP established three goals for response level emergency communications. As defined by the 2008 National Emergency Communications Plan, response-level communications is the capacity of individuals with primary operational leadership responsibility to manage resources and make timely decisions during an incident.

Primary operational leadership is at the top level of the Operations Section. The 2014 NECP is available at

http://www.dhs.gov/sites/default/files/publications/2014%20National%20Emergency%20Communications%20Plan_October%2029%202014.pdf

Topic Interoperability Continuum



Key Points

A full copy of the Continuum is on the last page of this unit.

What is the SAFECOM Continuum?

The Interoperability Continuum is a tool designed to aid the emergency response community and local, tribal, state, and Federal policy makers to ensure they address critical elements for success as they plan and implement interoperability solutions.

What are the lanes in the SAFECOM Interoperability Continuum?

- Governance, which is the actions and programs undertaken by leadership for the purposes of managing the organization
- Standard Operating Procedures, which are the policies and procedures determined by organizations to ensure consistency and accuracy of response; the continuum measures the geographic level of coordination
- Technology, which displays the level of sophistication and ease of interoperability as radio systems go from less to more sophistication
- Training and exercises, which measures the sophistication of training and the integration with other agencies during exercises
- Usage, which describes the frequency of use of interoperable systems and practices

Interoperability is a lot more than technology. All of the items listed in these lanes are tools for interoperability. All are acceptable and even essential for effective interoperability.

Topic Governance Lane

**Key Points**

Governance allows for the codification of interagency relationships. It is the “frame of the car,” or the organizational infrastructure that everything else is built upon. Governance can build sustainability in relationships between agencies. It is not always about control. It is also about having a problem solution before the problem occurs.

Governance refers to actions and programs undertaken by leadership for the purposes of managing the organization. Good governance in advance of an incident helps secure funding for communications operations, avoid confusion, and establish rights and responsibilities.

The Governance lane encourages individual agencies working independently to achieve regional cooperation by establishing authority through elected officials or executive councils. Organizations oftentimes establish a regional urban area working group with operational and technical subcommittees. This group then develops a regional strategic plan for interoperable communications and identifies a funding source (or sources).

The Governance section also establishes agency rights and responsibilities to avoid confusion once an incident occurs.

It is the ability to codify relationships and make relationships sustainable. It is also about having a problem solution before the problem occurs.

Topic Standard Operating Procedures Lane

**Key Points**

The SOPs lane promotes a set of SOPs at the local agency level to a regional set of communication SOPs that adopt ICS and integrate communications into National Incident Management Systems (NIMS) SOPs.

A proper SOP establishes:

- Rules of use
- Procedures for activation, response, and deactivation of communication resources
- A process for problem resolution

SOPs, as well as planning and operations, are created and run using common terminology rather than agency-specific codes or jargon. This avoids confusion on an incident, where personnel may be coming from different backgrounds.

Technology is not an unconditional solution to interoperability. SOPs are essential to effective interoperable communications.


The SOP Lane promotes a set of SOPs at the local agency level to a regional set of communications SOPs that adopt ICS and integrates communications into NIMS SOPs. They establish rules of use, procedures for activation, response, and deactivation of communications resources. They provide a process for problem resolution.

- The SOPs lane promotes a set of SOPs at the local agency level to a regional set of communication SOPs that adopt ICS and integrate communications into NIMS SOPs
- Using common terminology provides everyone on the incident a common dialect for describing the “who, when, why, where, what, and how” of operations, which is necessary when planning and running operations or forming SOPs

- Technology is not an unconditional solution to interoperability; SOPs are essential to effective interoperable communications

Technology Lane

- **Cache radios (swap radios):**
 - Both large and small caches have great utility
 - Small caches can be agile
 - Six portable radios in the back of a police sergeant's car can be deployed quickly to fill gaps in interoperability



Unit 4:
Interoperable Communications

Visual 4-7

Key Points

Radio caches are extremely useful tools for interoperability. These are radios set aside as a regional communications resource that are fully charged, have extra batteries and battery chargers, and are labeled with the owning agency information, frequencies, band, and system. Many times the deployment of cache radios can keep interoperability simple.

Emergency Management Assistance Compact (EMAC) allows for states to assist each other directly without federal declarations. EMAC may be very useful in making agreements with adjacent states.

The technology lane is a toolbox with a number of solutions. The Communications Unit Leader/COMT should be able to choose from any number of these solutions as appropriate to meet communications requirements of the specific incident being supported.

It is important to know:

- Where are your caches?
- What are the ordering procedures for a cache?
- Are there costs involved?
- Can you account for the cache you use?

EMAC

Agreements are in place for the use of resources between states www.emacweb.org

Topic Other Swap Radio Resources

Other Swap Radio Resources

- **NIFC: National Interagency Fire Center**
 - **Manages USFS, BLM, and aviation frequencies for primarily wildland fire fighting to provide a coordinated effort between Federal and State land management agencies**
 - **Manages portable communication equipment and systems**
 - **May provide a Communications Coordinator, depending on size, complexity, and number of incidents**

Unit 4:
Interoperable Communications

Visual 4-8

Key Points

The National Interagency Fire Center (NIFC) provides a Communications Coordinator at times, depending on the complexity and number of incidents occurring, to assign frequencies and equipment to incidents and prevent interference.

You must have a pre-arranged contract with NIFC to utilize their resources. Make contact through your State Land Management Agency to find out the process. This should also go in your MOB Guide.

NIFC facilitates a coordinated effort between Federal and State land management agencies for wildfire management by managing portable communication equipment and systems.

To utilize the National Incident Radio Support Cache there must be a prearranged reimbursable agreement in place to request this resource. The NIICD Cache System is designed to support land management incidents, namely wildfires. When NIICD radios are deployed to a non-wild land incident, they are typically requested by going through a State Forestry Agency, Department of Natural Resources, EMAC or other emergency management procurement process. It is required the cache be accompanied by a NWCG-qualified COMT.

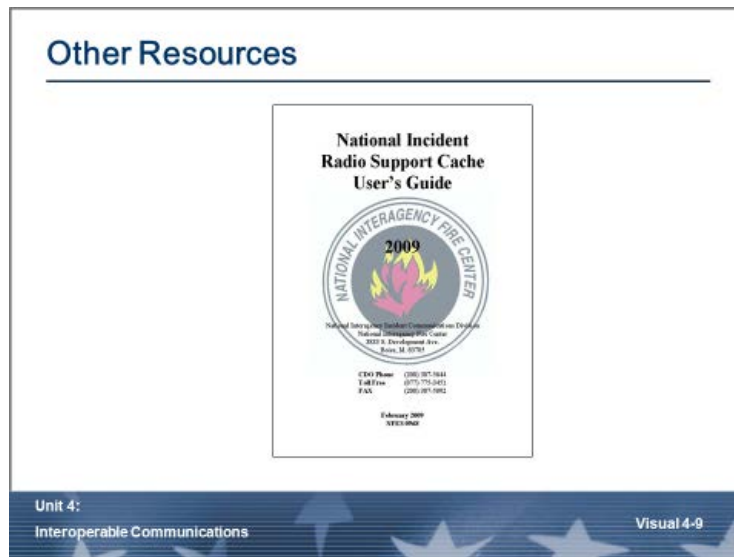
It is important to go through the proper channels when requesting these resources; however, even then, they are limited in availability. Availability may vary according to the state of the fire season and other factors at any given time.

- The NIFC manages USFS, BLM, and aviation frequencies, primarily for wildland firefighting

- NIFC manages portable communication equipment and systems and may provide a communications coordinator, depending on size, complexity, and number of incidents involved
- The National Incident Radio Support Cache also has equipment available for federally recognized incidents

Access the National Interagency Incident Communications Division at <http://www.fs.fed.us/fire/niicd/index.html>. To download the Radio Inventory Database, go to <http://www.fs.fed.us/fire/niicd/documents>, and select Radio Inventory Database under NIICD Documents.

Topic Other Resources

**Key Points**

You must have a prearranged reimbursable agreement in place to request this resource. As alternative, request through a State Forestry Agency, Department of Natural Resources, or through the emergency management procurement process.

This cache was designed primarily to support wildfire and land management agencies. Resources may be scarce during fire season.

Topic Technology Lane (cont'd)

Technology Lane (cont'd)

- **Gateways: Gateway systems interconnect channels of disparate systems**
 - **Fixed gateways, such as console patches, are in use in many dispatch centers**
 - **Mobile gateways, portable interconnect switches, require technical support**

Unit 4:
Interoperable Communications

Visual 4-10

Key Points

Gateways provide a connection between unlike radio bands or radio systems. They can make interoperability a reality, with quality audio and clean signals. Gateways are a tool, but can create issues as well. Proper gateway management is essential for safe and effective utilization.

Mobile gateways are not “Plug and Play.” Competent personnel must be available for most mobile gateway deployments.

Fixed gateways can be engineered, tested, and exercised with minimal expenditure of resources, and are therefore easy to train on.

Gateways are one of several tools available to bridge interoperability issues.

What is the basic function of a gateway, also referred to as an audio bridge or audio gateway?

What are the two basic types of gateways?

Fixed and Mobile

What is a mobile gateway?

Gateways may be portable or transportable, which means they can be taken to the incident, event or exercise.

What is a fixed gateway?

A fixed gateway is a centrally located in a fixed location to operate with the local area communication assets.

What is a console patch?

Console patches are preconfigured/hardwired into the console.

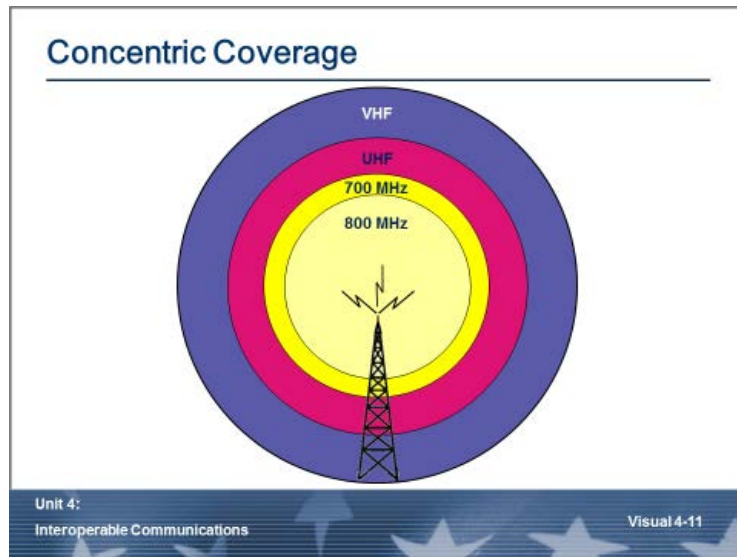
How does an audio gateway differ from a console patch?

This allows flexible patching between any/all systems interfaced with the audio gateways.

Are you using a gateway when a simpler method is available?

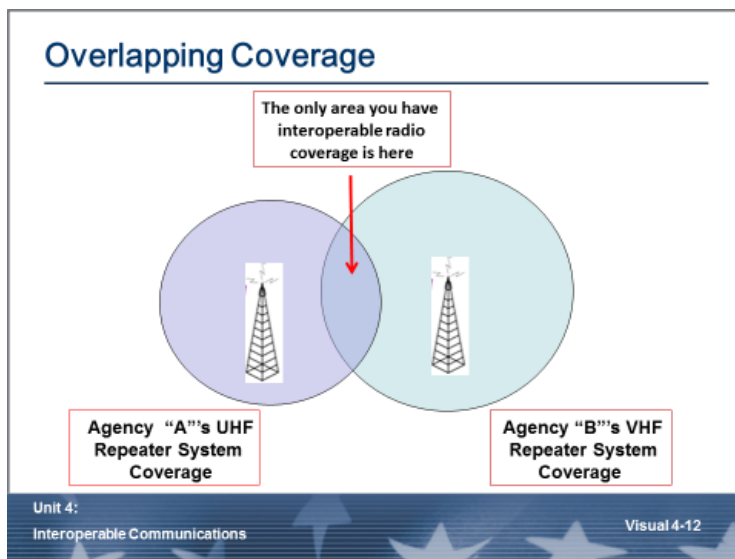
Topic

Concentric Coverage



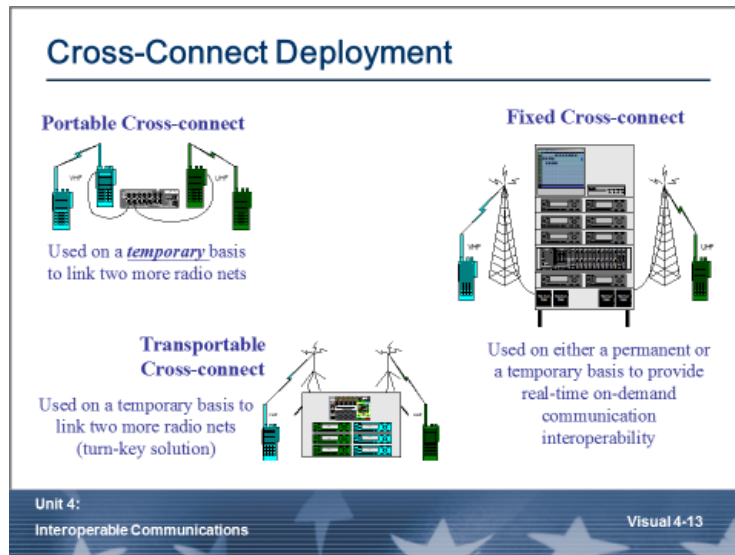
Key Points

Topic Overlapping Coverage



Key Points

Topic Cross-Connect Deployment

**Key Points**

- Fixed gateways are simple to deploy and can be tested and trained with regularly
 - Overlap coverage of disparate systems should be mapped
- Mobile gateways may have range limitations (simplex) and can have interference issues
- Portable gateways can have power supply limitations, reduced performance of portable receivers, and antenna limitations

Topic Technical and Operational Resources

**Key Points**

What are some things to consider when choosing a gateway?

- What will the gateway be used for? (i.e., deployment environment, mobile, fixed, in building, tunnel...)
- How many interfaces are required?
- Where will the interface devices be connected? (i.e., directly to the gateway, remotely via the Internet...)
- What types of patches are needed? (Many, one to many, many to one, one way monitor only...)
- What is your budget?
- How are you going to troubleshoot interference?
- How are you going to troubleshoot major system failure?

Topic Gateways—Pros

Gateways - Pros

- Gateways provide a connection between unlike audio sources or radio systems
- Gateways can make interoperability a reality, with quality audio and clean signals
- Properly configured gateways will allow all radios to hear all the traffic, taking system delays, etc., into consideration
- Fixed gateways can be engineered, tested, and exercised

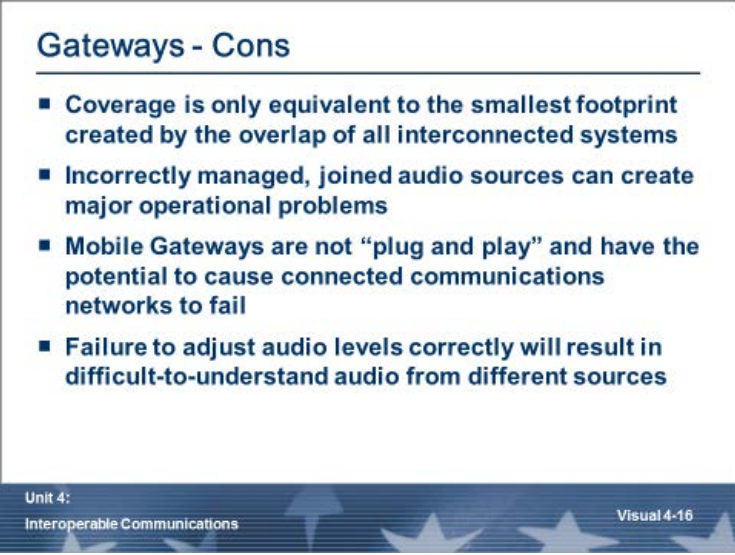
Unit 4:
Interoperable Communications

Visual 4-15

Key Points

What is the biggest advantage of a gateway?

Gateways provide interoperability between public safety service and support providers (i.e., law enforcement, firefighters, EMS, emergency management, the public utilities, transportation, and others). Gateways allow public safety agencies to communicate with staff from other responding agencies, and exchange voice and/or data communications on demand and in real-time.



Gateways - Cons

- Coverage is only equivalent to the smallest footprint created by the overlap of all interconnected systems
- Incorrectly managed, joined audio sources can create major operational problems
- Mobile Gateways are not “plug and play” and have the potential to cause connected communications networks to fail
- Failure to adjust audio levels correctly will result in difficult-to-understand audio from different sources

Unit 4:
Interoperable Communications

Visual 4-16

Key Points

Why don't you use a gateway to patch everyone at an incident to everyone else?

Only patch those systems that really need to talk to each other for the time they need to talk, to prevent excess chatter. It will cut down on the confusion of hearing different organizations on your net and there will be less people vying for air time. Remember, just because you can patch someone doesn't mean you should.

How can you ensure gateways are properly configured prior to deployment?

Many mobile radios require special programming; some require hardware modification to properly interface with a gateway. Interface radios should be tested and adjusted with the audio gateway when it is first received and prior to deployment.

Why are audio levels of the gateway important?

- Correct levels are required for proper operation
- Too high levels will cause flat-topping and distortion
- Too low levels will not provide adequate audio volume to drive the interface devices

Patched channels may not have identical coverage:

- Different location of transmitter
- Different frequency band characteristics

Topic Gateways—Cons (cont'd)

Gateways - Cons (cont'd)

- Not fully understanding the methodology used in the gateway can result in the “Ping-Pong” effect and other issues that make a combined system unusable
- Gateways require knowledgeable personnel with the skills to troubleshoot problems at all times
- Gateways must be used as a part of a coordinated plan at an incident; knowing where they are and what they are patching is essential for the COML
- Gateways are not plug and play

Unit 4:
Interoperable Communications

Visual 4-17

Key Points

Ping ponging is the effect when the radios in the patch begin bouncing between TX and RX with no signal present.

Why do you need a Gateway Specialist?

Gateways are not plug and play. A knowledgeable person can recognize and fix a problem before it affects the people in the field.

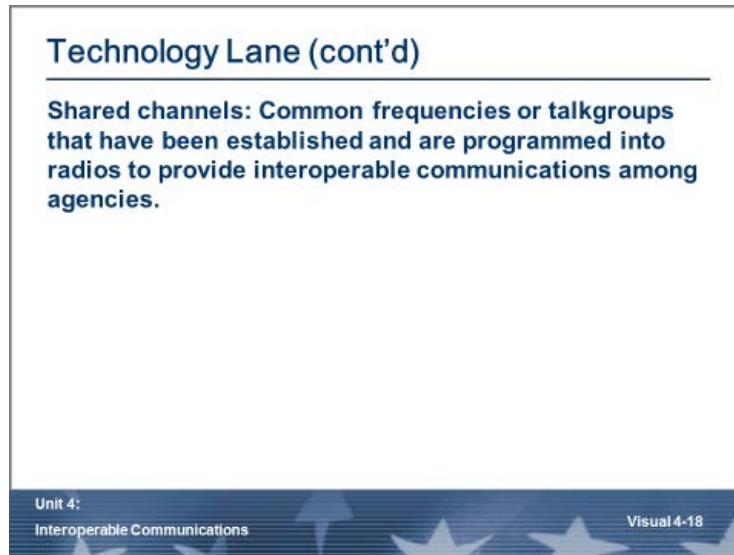
When at an incident where multiple gateways are used, what is the key to interoperability?

Coordination is the key; always go through the Communications Unit Leader prior to creating a patch and know what is being patched.

Portable and mobile gateways should have a specialist with them at all times.

Use caution to address itinerate gateways.

Gateway management is essential. Communications Unit Leaders should have the authority over any inventory on the scene.

Topic Technology Lane (cont'd)**Key Points**

Interoperability is promoted when agencies share a common frequency band, air interface (analog or digital), and are able to agree upon common channels.

Why don't public safety agencies all use the same shared channels?

The general frequency congestion that exists across the United States can place severe restrictions on the number of independent interoperability talk paths available in some bands. Also, different bands have different characteristics.

Shared channels are often ignored for more complex solutions. Shared channels are the most direct form of interoperability.

The selection of shared channels is often heavily dependent on the governance lane, as long-term decisions must be made about which organizations will use which frequencies.

Topic Technology Lane (cont'd)**Key Points**

A shared system involves use of a single proprietary radio system infrastructure (usually with all components from a single manufacturer) to provide service to several Public Safety agencies within a region.


Why are regional shared systems a solution to interoperability?

With proper planning of the talk group or channel structure, interoperability is provided as a byproduct of system design. Usually these are established at the request of the members of the governance lane, and require considerable coordination so that the shared system that is selected fits all of the local organization's needs.

Topic Technology Lane (cont'd)

Technology Lane (cont'd)

- **Standards-based Shared System - P25 is synonymous with Public Safety Digital Radio Standards in the United States**
- **Ongoing joint effort since 1989 between Association of Public-Safety Communications Officials, Intl. (APCO), the National Association of State Technology Directors (NASTD), the Telecommunications Industry Administration (TIA) and agencies of the Federal Government**



Unit 4: Interoperable Communications Visual 4-20

Key Points

Standards-based systems to ensure a future with an open, standards-based alternative for Public Safety digital radio systems have been a joint effort since October 1989 when APCO Project 25 came to being in a meeting jointly sponsored by APCO, NASTD, National Telecommunications and Information Administration (NTIA), the National Communications System (NCS) and the U.S. Department of Defense (DoD).

There are eight common elements of a standards system. These elements are:

- **Common Air Interface (CAI):** Point of connection between radio transmitters and receivers; defines the technical form and function of the digital signal that goes over the airwaves
- **Console Subsystem Interface (CSSI):** Defines how radio frequency components of a standards-based system and dispatcher consoles connect with one another
- **Data Interface**
- **Fixed Station Interface (FSI):** Defines how components of a shared standards radio system that are fixed in place connect with other components of the system
- **Inter-RF Subsystem Interface (ISSI):** Defines how different standards-based radio networks can connect with one another
- **RF Subsystem Interface (RFSS)**
- **Subscriber Data Peripheral Interface (MDTs, etc.)**
- **Telephone Interconnect Interface**

Topic Standards-based Shared System

Standards-based Shared Systems

- The goal of P25 is to ensure a future with an open standards-based alternative for Public Safety digital radio systems
- Phase One is for 12.5 kHz channels and Phase Two is for 6.25 kHz channels
- P25 has eight defined interfaces
 - Common Air Interface (CAI)
 - Console Subsystem Interface (CSSI)
 - Data Interface
 - Fixed Station Interface (FSI)
 - Inter-RF Subsystem Interface (ISSI)
 - RF Subsystem Interface (RFSS)
 - Subscriber Data Peripheral Interface (MDTs, etc.)
 - Telephone Interconnect Interface

Unit 4:
Interoperable Communications

Visual 4-21

Key Points

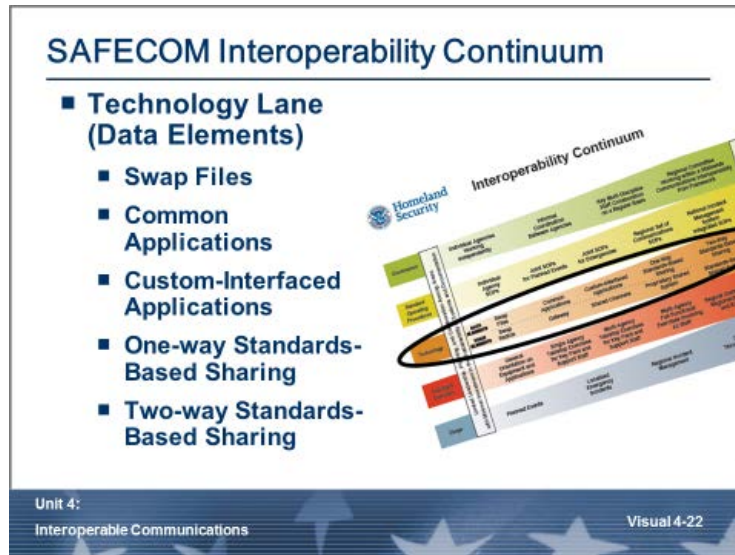
Project 25, or P25 is a phased approach to fielding new Public Safety communications technology as quickly as it is available, the development of standards and the testing of the technology in the field.

P25 is an ongoing, phased effort to introduce technology promoting interoperability, providing a backward/forward migration path to related technologies. P25 also ensures lifecycle competitive procurement, spectrum efficiency, and is operationally user friendly.

The goal of P25 is to ensure a future with an open standards-based alternative for Public Safety digital radio systems in the United States and across the globe (P25 is also used in many other countries).

P25 is not a completed standard at this time. Several P25 interfaces are still in the standards approval process. P25 standards are recognized ANSI standards.

Topic SAFECOM Interoperability Continuum

**Key Points**

Swap Files - Swapping files involves the exchange of stand-alone data/application files or documents through physical or electronic media (e.g., universal serial bus devices, network drives, emails, faxes). This process effectively creates a static “snapshot” of information in a given time period. Though swapping files requires minimal planning and training, it can become difficult to manage beyond one-to-one sharing. With data frequently changing, there may be issues concerning the age and synchronization of information, timing of exchanges, and version control of documents. Each of these issues can hinder real-time collaborative efforts. In addition, the method of sharing files across unprotected networks raises security concerns.

Common Applications - The use of common proprietary applications requires agencies to purchase and use the same or compatible applications and a common vocabulary (e.g., time stamps) to share data. Common proprietary applications can increase access to information, improve user functionality, and permit real-time information sharing between agencies. However, the use of common proprietary applications requires strong governance to coordinate operations and maintenance among multiple independent agencies and users; these coordinated efforts are further compounded as the region expands and additional agencies use applications. Common proprietary applications also limit functionality choices as all participating agencies must use compatible applications.

Custom-Interfaced Applications - Custom-interfaced applications allow multiple agencies to link disparate proprietary applications using single, custom “one-off” links or a proprietary middleware application. As with common applications, this system can increase access to information, improve user functionality, and permit real-time information sharing among agencies. Improving upon common applications, this system allows agencies to choose their own application and control the functionality choices.

However, if using one-to-one interfaces, the use of multiple applications requires custom-interfaces for each linked system. As the region grows and additional agencies participate, the required number of one-to-one links will grow significantly. Proprietary middleware applications allow for a more simplified regional expansion; however, all participants must invest in a single “one-off” link to the middleware, including any state or Federal partners. Additionally, custom-interfaced applications typically require more expensive maintenance and upgrade costs. Changes to the functionality of linked systems often require changes to the interfaces as well.

One-Way Standards Based Sharing - One-way standards-based sharing enables applications to “broadcast/push” or “receive/pull” information from disparate applications and data sources. This system enhances the real-time common operating picture and is established without direct access to the source data; this system can also support one-to-many relationships through standard-based middleware. However, because one-way standards-based sharing is not interactive, it does not support real-time collaboration between agencies.

Two-Way Standards-Based Sharing - Two-way standards-based sharing is the ideal solution for data interoperability. Using standards, this approach permits applications to share information from disparate applications and data sources and to process the information seamlessly. As with other solutions, a two-way approach can increase access to information, improve user functionality, and permit real-time collaborative information sharing between agencies. This form of sharing allows participating agencies to choose their own applications. Two-way standards-based sharing does not face the same problems as other solutions because it can support many-to-many relationships through standards-based middleware. Building on the attributes of other solutions, this system is most effective in establishing interoperability.



Key Points

Secretary of Commerce must appoint at least 3 individuals to represent the collective interests of States, localities, tribes, and territories; seek to ensure geographic and regional representation of the United States; seek to ensure rural and urban representation; and appoint at least 3 individuals who have served as public safety professionals and at least 3 appointed individuals are to represent the collective interests of States, localities, tribes, and territories.

Topic FirstNet (cont'd)

FirstNet (cont'd)

The Middle Class Tax Relief and Job Creation Act of 2012

- **Provide Singular Focus**
- **Creates FirstNet as an independent entity within the NTIA**
- **The First Responder Network Authority shall:**
 - **Hold the single public safety wireless license**
 - **Take all actions necessary to ensure the building, deployment, and operation of the nationwide public safety broadband network**

Unit 4:
Interoperable Communications

Visual 4-24

Key Points

The Middle Class Tax Relief and Job Creation Act of 2012 creates FirstNet as an independent entity within the NTIA and empowers it to oversee the establishment of an interoperable broadband network for public safety. The act requires that state and local agencies have a consulting role in the development, deployment, and operation of the nationwide network. The act further provides an opportunity for states to build their own radio access networks within the framework of the nationwide broadband network.

Key elements of the legislation:

- Reallocates the 10 MHz D Block to Public Safety, and along with the Public Safety Spectrum Trust (PSST) 10 MHz, provides a total of 20 MHz broadband public safety spectrum.
- Establishes a Network Construction Trust fund of \$7 billion.
- Establishes a temporary FCC Interoperability Board.
- Establishes a standing FirstNet Board.
- Establishes a standing Public Safety Advisory Board to the FirstNet board.
- Establishes NTIA state planning grants (\$135M).
- Requires public safety licensees to vacate T-Band channels within 9-11 years.
- Provides a \$300 million fund to NIST for research.
- Does not affect the 700 MHz public safety narrowband (i.e. P25 voice) spectrum.

Topic FirstNet (cont'd)

FirstNet (cont'd)

- First time, lawmakers legislated a technology –
 - Long Term Evolution or LTE
 - Ensures interoperability
 - Fosters the availability of low cost user devices
- Act's dedicated 20 MHz of 700 MHz public safety broadband spectrum
- FirstNet service must cover 95 percent of the United States including all 50 states, the District of Columbia, and all territories

Unit 4:
Interoperable Communications

Visual 4-25

Key Points

Topic FirstNet (cont'd)

FirstNet (cont'd)

- **Why FirstNet?**
- **Public safety community has been frustrated by the lack of progress in realizing a dedicated, reliable, interoperable network**
- **Ten years after 9/11, public safety users still have interoperability problems**
- **FirstNet represents a most significant development for public safety**

Unit 4:
Interoperable Communications

Visual 4-26

Key Points

Despite billions spent on homeland security, the public safety community has been frustrated by the lack of progress in realizing the recommendations of the 9/11 Commission to establish a dedicated, reliable, interoperable network for first responder and public safety communications.

Ten years after 9/11, public safety users still are hindered by fragmented systems, using differing frequencies and disparate equipment, resulting in costly inefficiencies. At the urging of public safety stakeholders, Congress passed legislation in 2012 to fund and govern a nationwide public safety broadband network.

FirstNet represents a most significant development for public safety – the promise of a dedicated, fully interoperable broadband system across the United States. A network that provides vast new capabilities, enhances safety and performance, and improves the cost effectiveness of public safety communications.

Topic FirstNet (cont'd)

FirstNet (cont'd)

- Who will use FirstNet?
- FirstNet is dedicated for the public safety community's use:
 - Law Enforcement
 - Firefighters
 - Emergency Medical Personnel
- Secondary users
 - Utilities
 - Critical infrastructure

Unit 4:
Interoperable Communications

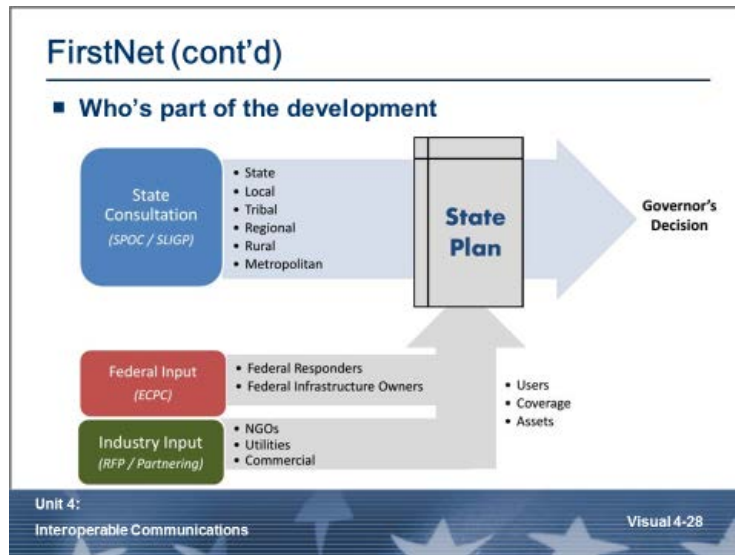
Visual 4-27

Key Points

The FirstNet Network will provide high speed data network coverage wherever public safety needs it, including the most rural and remote areas of a law enforcement agency's jurisdiction. The expansive data throughput of LTE broadband, which is theoretically more than 15 times faster than 3G cellular data today, is truly a transition "from garden hose to fire hose," enabling a broad range of new public safety mission support capabilities that, until now, were simply not possible.

Using this high speed data network, public safety personnel will see real-time information from their hardened smart phones, such as viewing detailed building diagrams and dynamic geographic information system (GIS) map data. First responders can act quickly and in coordination as the network supplies video feeds from traffic cameras, immediately indicating the severity and extent of an accident. Emergency medical personnel will transmit patient information and health telemetry to emergency rooms and trauma centers while en route to the medical center, with vital lifesaving data arriving in advance of the injured.

Topic FirstNet (cont'd)



Key Points

- State POC (SPOC)
- State and Local Implementation Grant Program (SLIGP)
- Emergency Communications Preparedness Center (ECPC)
- Request for Proposal (RFP)

Each governor has the option to decide whether his or her state wants to conduct its own deployment of a broadband Radio Access Network (RAN).

If a state decides to opt-out, it has 6 months to develop and complete its own RFP process for a broadband RAN within the state, subject to FCC approval.

States that are approved to opt-out are eligible to apply to the NTIA for a grant for construction of their broadband RAN, and for a spectrum lease, however, they will be required to connect to the federal core.

Topic Training and Exercises Lane

Training and Exercises Lane

- Single agency to regional training and exercise of the Tactical Interoperable Communication Plans (TICPs)
- Following Homeland Security Exercise and Evaluation Program (HSEEP) guidance
- Discussion-based Table Top Exercises (TTX)
- Operationally focused:
 - Functional Exercises (FE)
 - Full-Scale Exercises (FSE)

Unit 4:
Interoperable Communications

Visual 4-29

Key Points

Regional exercises are an excellent opportunity to establish a Communications Unit Leader for the area, in addition to the benefits of working cooperatively, and aid the goal of interoperability accordingly.

A result of these exercises is the opportunity for creation and exercise of Tactical Interoperable Communication Plans (TICPs), which provide a context and/or reference for a Communications Unit Leader, should an actual incident occur.

The Training and Exercise Lane provides for single-agency training and exercising as well as regional training and exercising of the TICP. Regional exercises are an excellent opportunity to establish a Communications Unit Leader.

Following Homeland Security Exercise and Evaluation Program (HSEEP) guidance, and making ample use of the NIMS discussion-based Table Top Exercises (TTX) ensures maximum readiness and understanding of interoperability scenarios.

Topic Usage Lane

**Key Points**

The Usage Lane encourages the use of a Communication Plan for planned events, local emergencies, and regional incidents, used on a daily basis.

Gaining familiarity with the format and requirements of the plan allows the Communications Unit Leader to function more efficiently when called to a major incident. Regular usage of interoperable systems builds confidence in responders who develop better familiarization.

This lane encourages the use of the TICP for planned events, local emergencies, regional incidents, and on a daily basis.

Usage is the keystone of all interoperable communications. If it is not used on a daily basis, it will not be used in incident response.

Routine usage of interoperable elements promotes familiarity and consistency.

The Usage lane of the Interoperability Continuum encourages daily use of a communication plan whenever staffing:

- Planned events
- Local emergencies
- Regional incidents

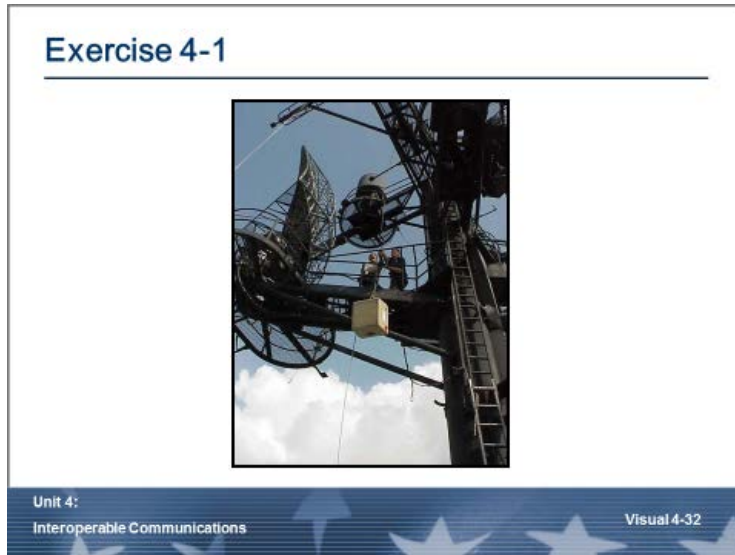
Topic Exercise 4-1 - Communication Asset Deployment Strategies



- **Key Points**

The purpose of the exercise is to provide the participants with an opportunity to develop deployment strategies for portable repeaters in all-hazards environments, explain the challenges their strategy overcomes and identify any challenges created by their strategy.

Topic Exercise 4-1, Image 1



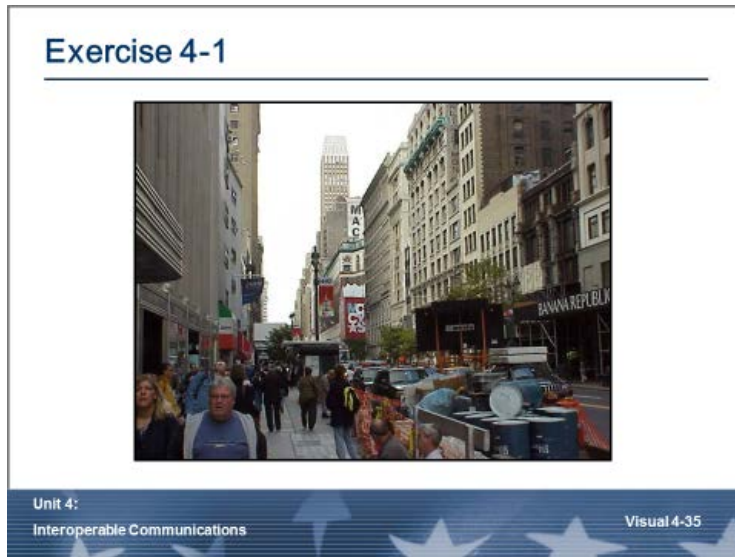
Key Points



Key Points



Key Points



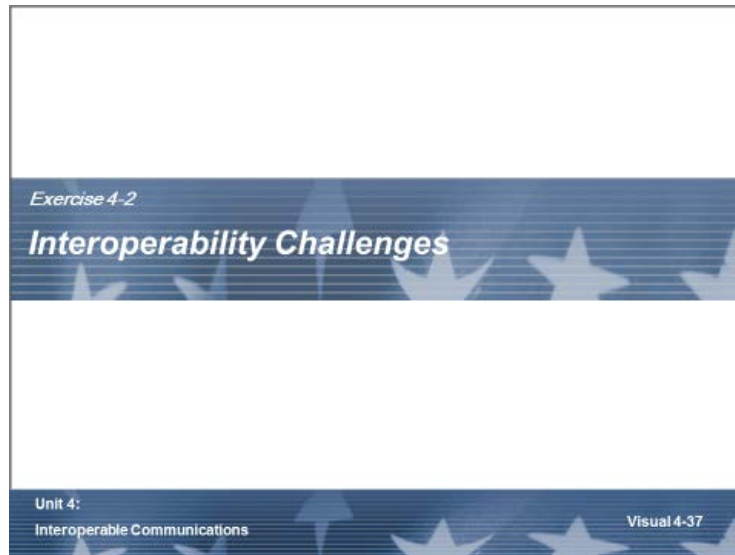
Key Points



Key Points

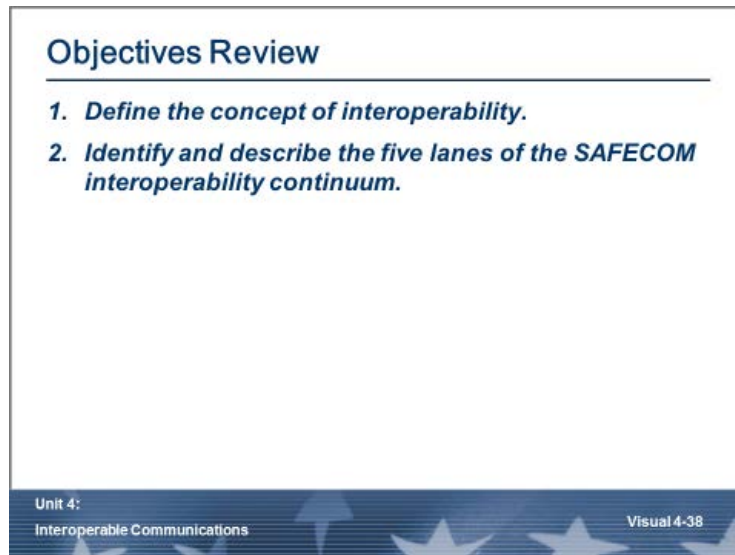
Topic

Exercise 4-2

**Key Points**

The purpose of this exercise is to provide the participants with an opportunity to identify the challenges specific to communications in certain all-hazards environments and how to use existing communications technology to overcome these challenges. The exercise is scheduled to last approximately 30 minutes, including small group discussions and presentation of group findings. Students will break into small groups and compile a list of potential challenges and solutions to operating within the urban environment in the train derailment scenario. Students will then present their findings to the class.

Topic Objectives Review

**Key Points**

Unit Terminal Objective

Identify methods for the application, coordination, and use of interoperable communications.

Unit Enabling Objectives

- Define the concept of interoperability.
- Identify and describe the five lanes of the SAFECOM Interoperability Continuum.

Topic

Questions?

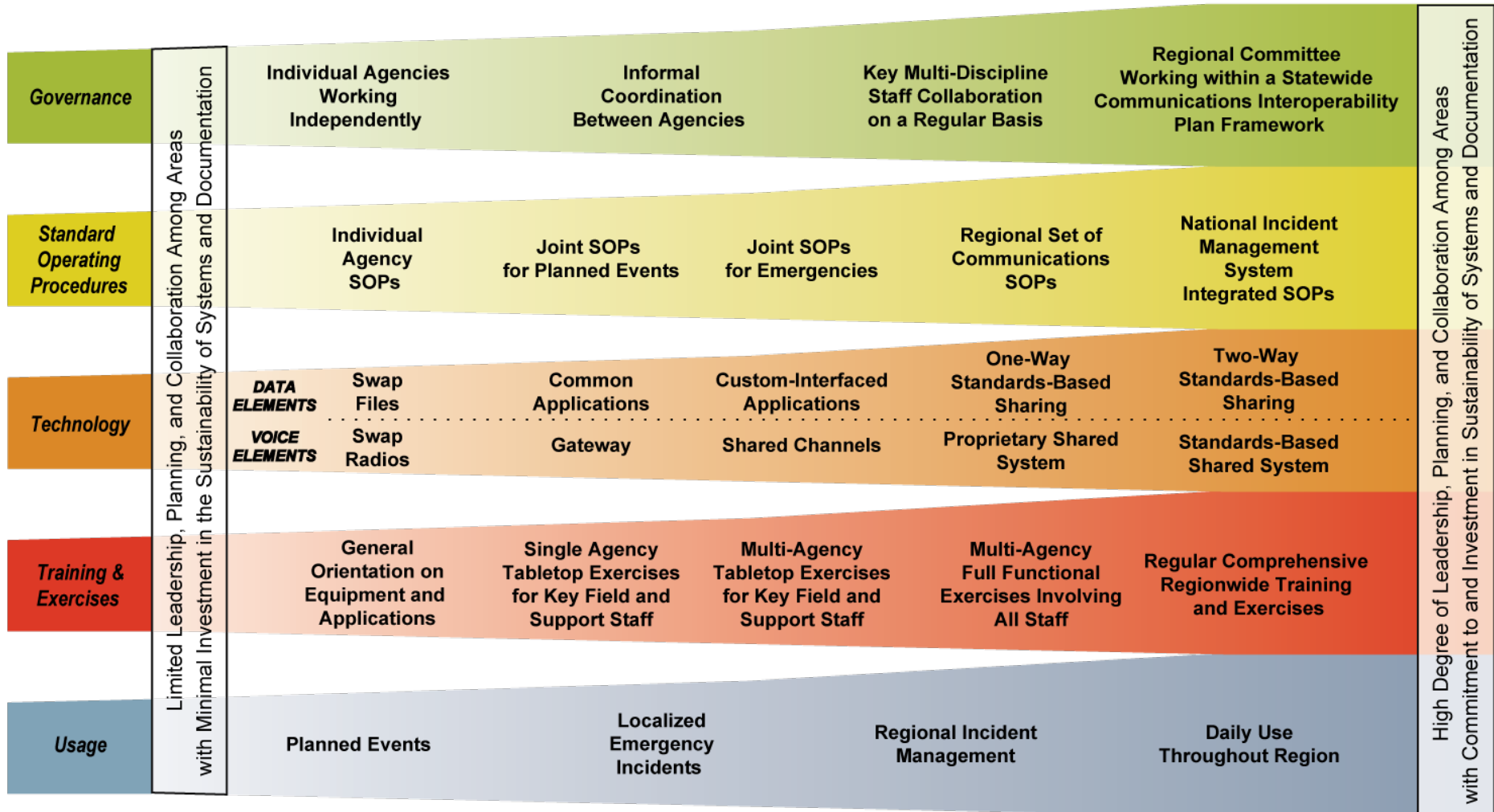


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Key Points



Homeland Security

Interoperability Continuum



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Unit 5: Frequency Regulations and Usage

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Identify methods and standards relating to frequency regulations and usage
- Identify the factors influencing frequency coordination efforts
- Understand local use agreements and special temporary authorizations
- Identify and describe considerations in recognizing and preventing interference
- Identify modes of typical types of radio systems in use today
- Describe the Public Safety Spectrum Bands
- Identify RF safety issues

Methodology

This unit uses lecture, discussion based activities, and exercises.

The purpose of this unit is to provide students with an orientation to methods and standards related to frequency regulations and usage.

The purpose of Exercise 5 is to provide the participants with an opportunity to identify how to address frequency issues and explain their solutions to address these challenges.

Knowledge of unit content will be evaluated through administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of Exercise 5.

Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson (first part, day 1)	30 minutes
Lesson (second part, day 2)	2 hours, 30 minutes
Exercise 5	20 minutes
Total Time	3 hours, 20 minutes

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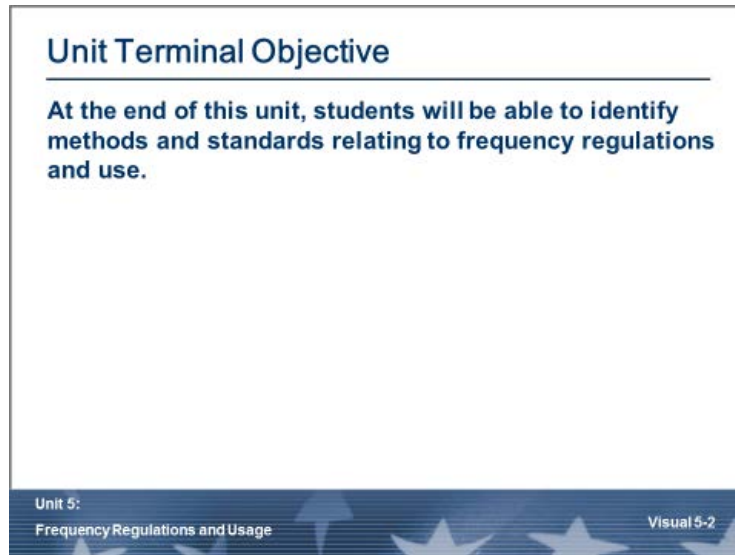
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective



Key Points

Unit Terminal Objective

At the end of this unit, students will be able to identify methods and standards relating to frequency regulations and use.

Unit Enabling Objectives

- Identify the factors influencing frequency coordination efforts
- Understand local use agreements and special temporary authorizations
- Identify and describe considerations in recognizing and preventing interference
- Identify modes of typical types of radio systems in use today
- Describe the Public Safety Spectrum Bands
- Identify RF safety issues

Topic Terminology and Conventions of Use

Terminology and Conventions of Use

- A *frequency* is a defined unit of electromagnetic spectrum, one of several parameters that define a channel
- A *channel* is a talk path and may utilize one or two frequencies
- A *talkgroup* is a virtual channel within a group of frequencies

Unit 5:
Frequency Regulations and Usage

Visual 5-3

Key Points

Topic Terminology and Conventions of Use (cont'd)

Terminology and Conventions of Use (cont'd)

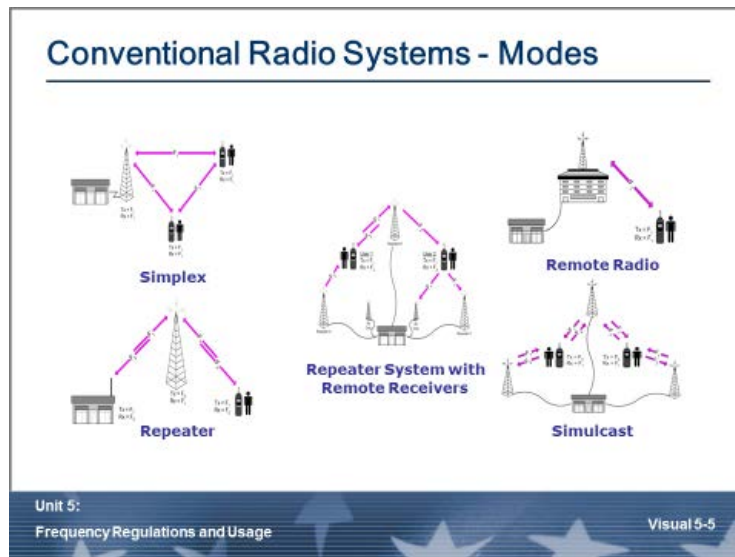
- Frequencies are written with up to five places past the decimal and should be identified as “wide” (25 kHz spacing) “narrow” (12.5 kHz spacing) or “ultra-narrow” (6.25 kHz spacing)
 - Example: 155.4750 N
 - All frequency references on an ICS Form 205 represent mobile and portable frequencies

Unit 5:
Frequency Regulations and Usage

Visual 5-4

Key Points

Topic Conventional Radio Systems Modes

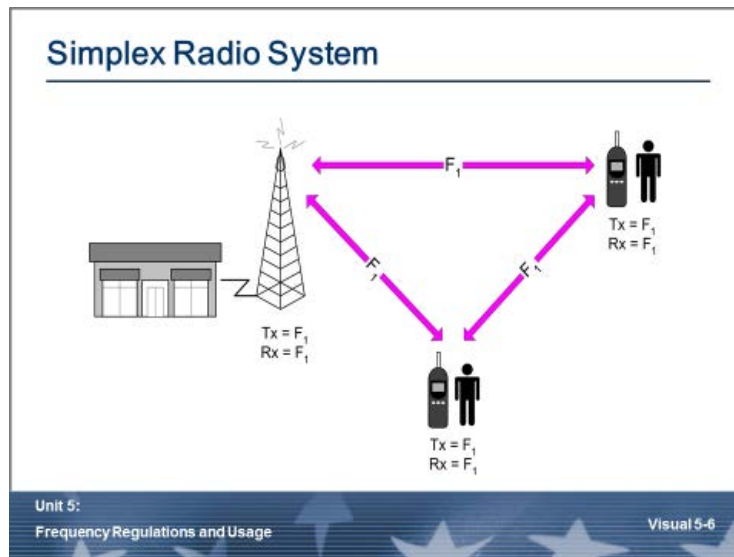
**Key Points**

- Conventional radio system modes:
 - Simplex
 - Repeated
 - Simulcast
- Trunked radio system modes
 - Repeated
 - Simulcast

How does a Multicast network differ from a Simulcast?

Multicast systems are similar to simulcast systems with exception of the radio channels transmitted. While a simulcast system transmits on the same RF channels simultaneously from each base station/repeater, multicast systems use different RF channels at each site.

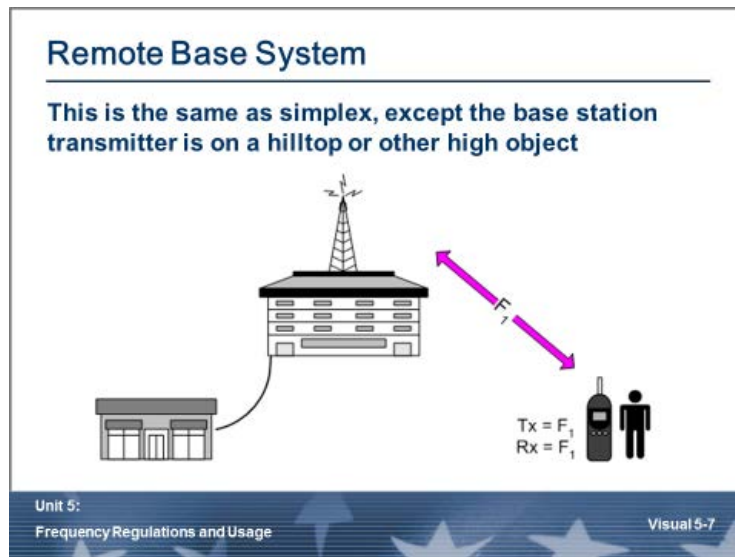
Topic Simplex Radio System

**Key Points**

What is a Simplex network?

In Simplex operation, one radio of the system transmits while the other radio(s) receives. Simultaneous transmission and reception at a radio is not possible with Simplex operation. The Simplex dispatching system consists of a base station, mobile/portable units, all operating on a single frequency. Simplex operation is generally limited to a line-of-sight. Simplex requires no additional external equipment, infrastructure or systems to work. Simplex mode remains a valuable tool within all system types, and is commonly used in tactical environments.

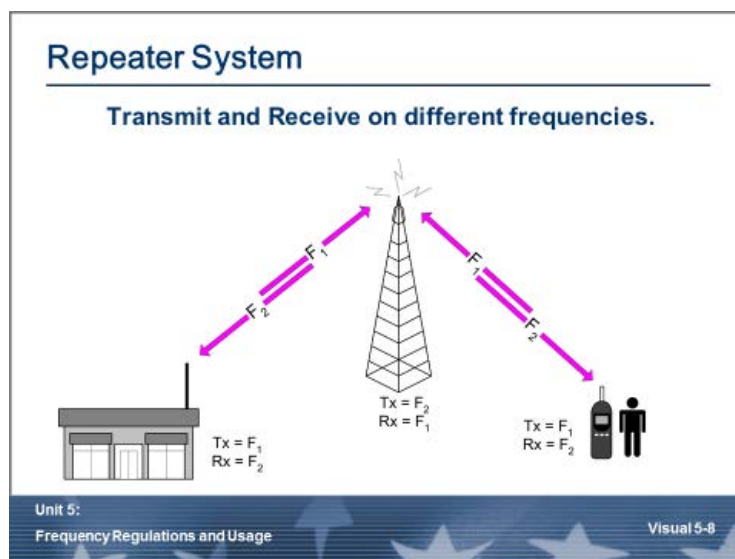
“Car-to-car” or “direct” are common terms for this.

Topic Remote Base System**Key Points**

What is the limiting factor on remote base system's usable transmit range?

The base transmitter in a Land Mobile Radio (LMR) system typically has much more power than mobiles or portable radios. The base antenna is typically at a much higher elevation than mobile or portable radio antennas. For these reasons, mobile and portable communications are limited by their talk-back capability.

Topic Repeater System

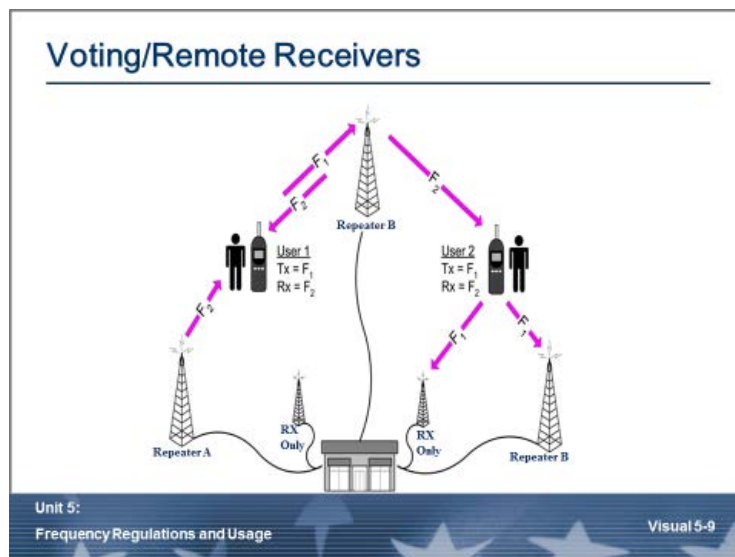
**Key Points**

What is a Half-Duplex/Repeated network?

A repeater is an electronic device that receives a weak or low level radio signal and retransmits it to overcome obstacles and increase range. In repeated systems, a channel is made up of two different frequencies. The repeater transmits on the mobile's receive frequency and vice versa. Repeated systems are deployed to overcome "line-of-sight" obstacles presented by terrain, obstructions, or distance.

These systems are used to extend range, but only one person can speak at a time.

Topic Voting/Remote Receivers (cont'd)

**Key Points**

Why would you use voting/remote receivers?

To improve the talkback capability.

How do voting/remote receivers work?

A number of radio receivers located in strategic areas receive the RF signal from a mobile or portable unit. Receive-only sites act as “listening-only” base stations that receive the lower power signals of mobiles and portables and relay them back to a base station or repeater, usually via dedicated telephone or microwave links. By using one or more receive-only sites in conjunction with a high-power base station or repeater transceiver, the overall system talk back coverage can be expanded.

Topic Voting/Remote Receivers (cont'd)

Voting/Remote Receivers (cont'd)

- Remote or satellite receivers are used in addition to regular repeater base station or trunk receivers to pick up relatively weak portable and mobile signals
- Audio from these receivers is routed to a central voting comparator or voter where the best received audio is selected
- The strongest signal is not always selected; that with the highest signal-to-noise ratio is typically best

Unit 5:
Frequency Regulations and Usage

Visual 5-10

Key Points

How are remote or satellite receivers used?

Remote/satellite receivers act as “listening-only” base stations that receive the lower power signals of mobiles and portables and relay them back to a base station or repeater, usually via dedicated telephone or microwave links.

Topic Voting/Remote Receivers (cont'd)

Voting/Remote Receivers (cont'd)

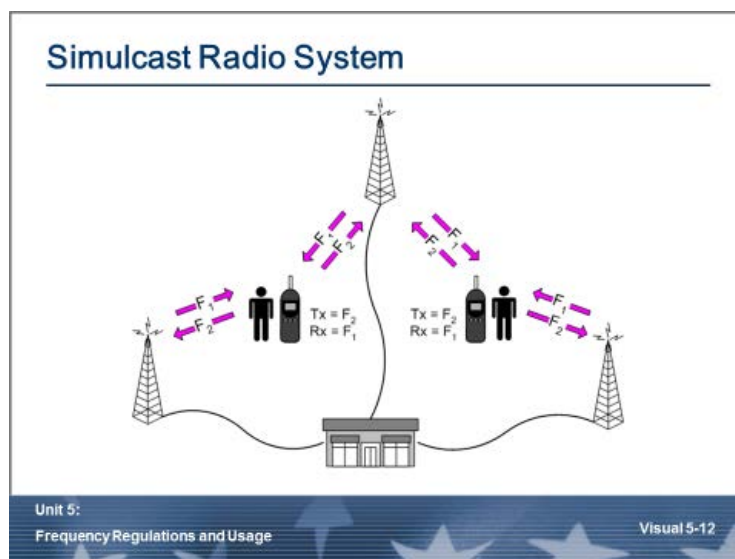
- Selected audio may come from multiple receivers during a single transmission
- Some systems are configured to lock onto a single receiver, once chosen, for a transmission
- Selected audio is routed to the ultimate receiving locations, such as consoles or repeaters for retransmission

Unit 5:
Frequency Regulations and Usage

Visual 5-11

Key Points

Topic Simulcast Radio System

**Key Points**

What is a Simulcast network?

Simulcast systems use several geographically separated base stations/repeaters that transmit on the same frequencies simultaneously. Through this type of a system deployment, a single radio channel can be radiated over a wider region than with a single-site transmitter. These networks require a timing system to synchronize each transmitter on the network to assure that transmissions on the same frequency are in phase thus reducing heterodyne interference.

Systems are complex to engineer and require thoughtful design. Simulcast systems do not increase capacity; in fact, they add to system loading.

Topic The Radio Spectrum

The Radio Spectrum

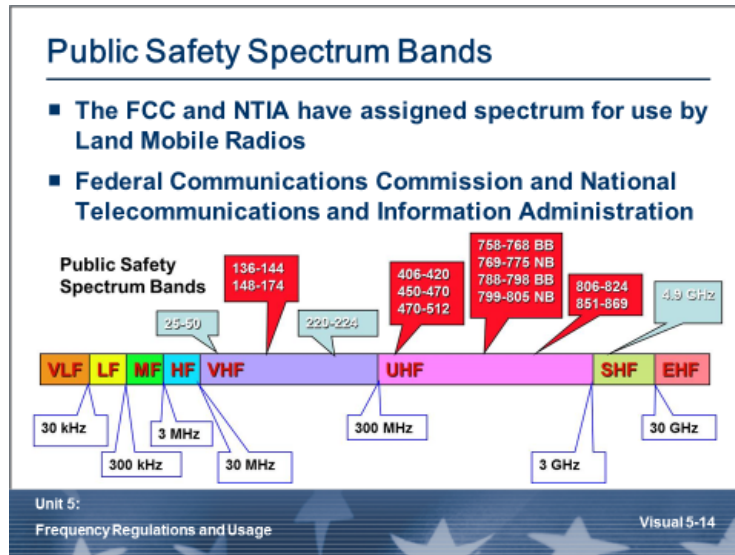
- Radio frequencies are the products of resonance or vibration
- These vibrations can be used for effective communication at a number of frequencies
- As the speed of the resonance increases, physical properties change
- Frequencies range from the audible to the production of light
- As frequencies pass above the audio range, the waves begin to travel through air and become radio frequencies

Unit 5:
Frequency Regulations and Usage

Visual 5-13

Key Points

Topic Public Safety Spectrum Bands



Key Points

Who assigns State and local (non-Federal) frequency assignments?

The Federal Communications Commission (FCC) assigns State and local frequencies.

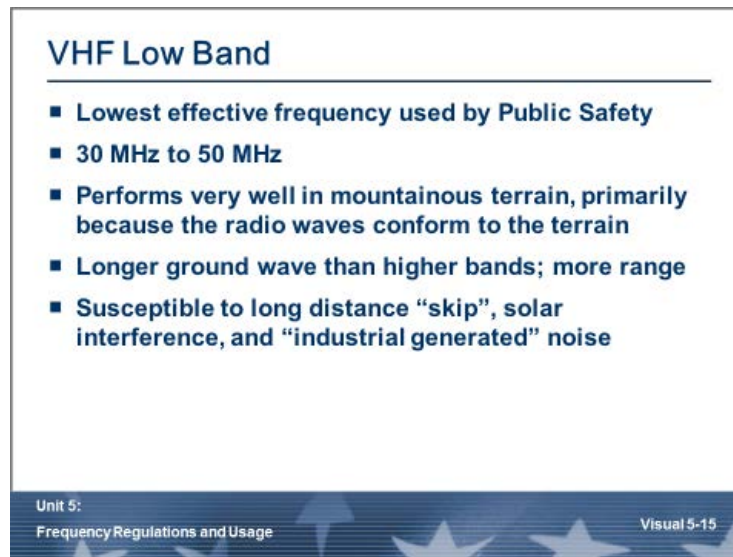
Who assigns the Federal frequency assignments?

National Telecommunications & Information Administration (NTIA) allocates bands for public safety use (as indicated on the chart), which are small segments of the overall spectrum. What are the primary frequency bands being used for public safety today? (FCC & NTIA)

- VHF low band (30 - 50 MHz)
- VHF high band (136-174 MHz)
- UHF (421-512 MHz)
- 700 (769-775 and 799-805 MHz)
- 700 MHz, Public Safety now has 10+10 MHz of Broadband Spectrum for FirstNet, 2 MHz guard-band, and still retains 6+6 MHz of Narrowband Spectrum
- 800 band (806-824 and 851-869 MHz; 806-816 and 851-861 MHz after rebanding)
- 4.9 GHz (4.940 – 4.990 GHz)

Topic

VHF Low Band



VHF Low Band

- Lowest effective frequency used by Public Safety
- 30 MHz to 50 MHz
- Performs very well in mountainous terrain, primarily because the radio waves conform to the terrain
- Longer ground wave than higher bands; more range
- Susceptible to long distance “skip”, solar interference, and “industrial generated” noise

Unit 5:
Frequency Regulations and Usage

Visual 5-15

Key Points

- VHF Low Band can travel great distances, so the person to whom you are speaking may not be who you wanted
- Low band is still in use in many States, though very few manufacturers still make low band equipment
- Susceptible to background noise, which has increased greatly due to the proliferation of other technologies
- Caution should be used in placing low-band channels in gateways due to potential interference

Topic VHF High Band



VHF High Band

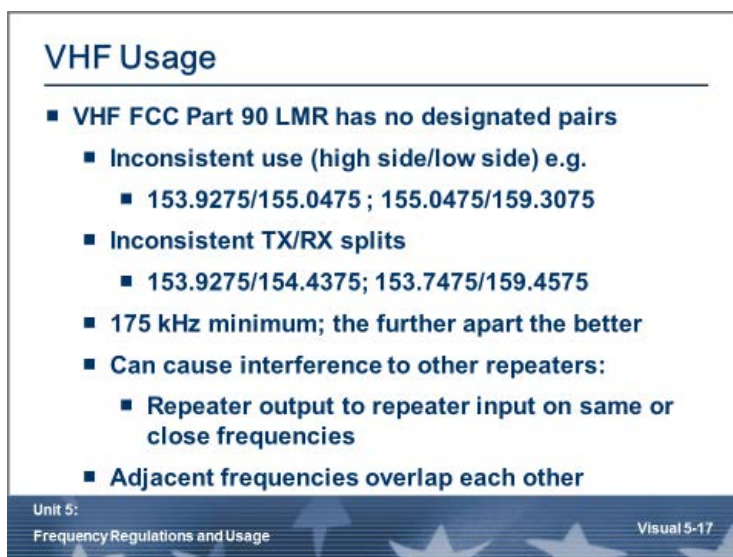
- Widely mixed use – most commonly used public safety band
 - 108-137 MHz – Exclusive to aviation (AM modulation)
 - 138-144 MHz – Exclusive to Federal (primarily military)
 - 144-148 MHz – Amateur radio
 - 148-150 MHz – Shared mobile and satellite
 - 150-162 MHz – State & local public and private
 - 156-157, 161-162 MHz – Marine band
 - 162-174 MHz – Primarily Federal
- Non-Federal LMR Frequency pairings are random
- Extensive Federal use
- Good medium-range propagation

Unit 5:
Frequency Regulations and Usage

Visual 5-16

Key Points

- Most commonly used frequency band in public safety (50% of licensed systems)
- No standard frequency pairings for repeaters
- Most Federal law enforcement and Federal land management (fire) is on VHF



VHF Usage

- VHF FCC Part 90 LMR has no designated pairs
 - Inconsistent use (high side/low side) e.g.
 - 153.9275/155.0475 ; 155.0475/159.3075
 - Inconsistent TX/RX splits
 - 153.9275/154.4375; 153.7475/159.4575
 - 175 kHz minimum; the further apart the better
 - Can cause interference to other repeaters:
 - Repeater output to repeater input on same or close frequencies
 - Adjacent frequencies overlap each other

Unit 5:
Frequency Regulations and Usage

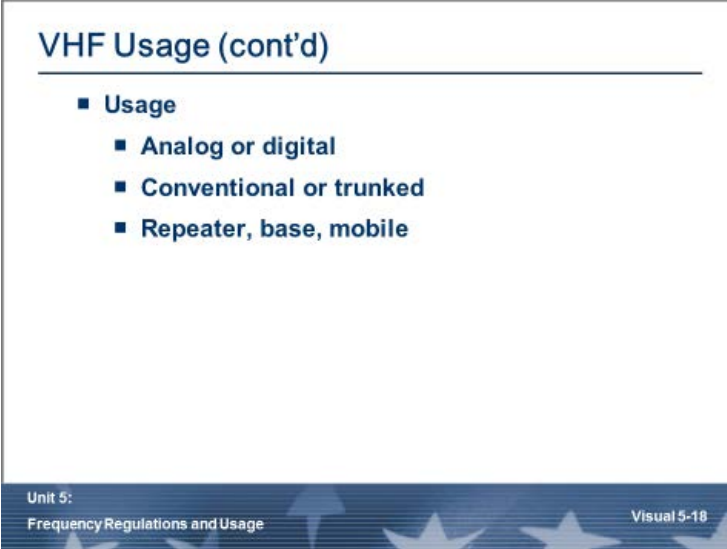
Visual 5-17

Key Points

When equipment was invented that could use the VHF high band spectrum, repeaters hadn't been invented yet, so the powers that be (FCC and NTIA) never designated repeater pairs.

When repeaters were finally invented, so many frequency assignments had been given out there wasn't room to make a consistent channel plan. Repeater pairs that were assigned had to be placed where there weren't any assignments. Since this is the most heavily used spectrum, it led to inconsistent spacing which makes the assignments appear random.

Topic VHF Usage (cont'd)



VHF Usage (cont'd)

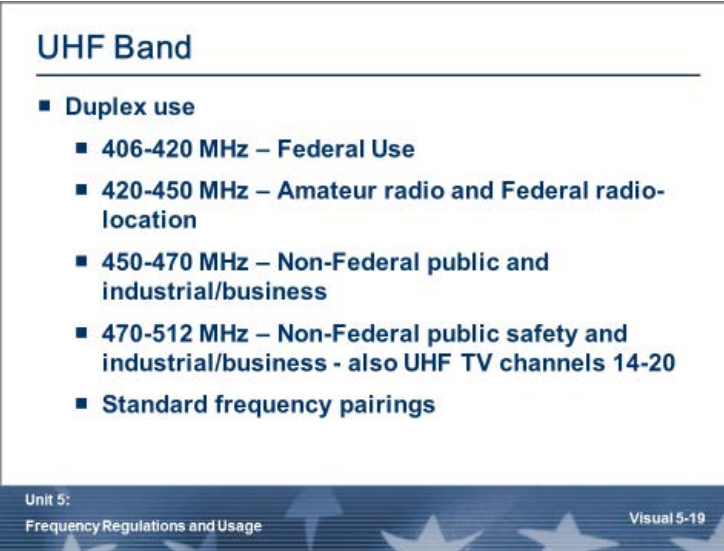
- Usage
 - Analog or digital
 - Conventional or trunked
 - Repeater, base, mobile

Unit 5:
Frequency Regulations and Usage

Visual 5-10

Key Points

- All modes of transmission (analog or digital)
- All forms of system design (conventional or trunked)
- All form factors (repeaters, base stations, mobiles, portables).



UHF Band

- Duplex use
 - 406-420 MHz – Federal Use
 - 420-450 MHz – Amateur radio and Federal radio-location
 - 450-470 MHz – Non-Federal public and industrial/business
 - 470-512 MHz – Non-Federal public safety and industrial/business - also UHF TV channels 14-20
 - Standard frequency pairings

Unit 5:
Frequency Regulations and Usage

Visual 5-19

Key Points

- Two way communications were invented when we started using this band so standard frequency pairings were established.
- “T-Band” came from reallocated television channels 14 – 20; public safety occupies this spectrum in some coastal areas of the U.S.
- An example of standard frequency pairing includes 453/458.2125

Topic UHF Paired Frequencies

UHF Paired Frequencies

- Paired splits
 - The standard split for 406 to 420 MHz is 9 MHz
 - The standard split for 420 to 470 MHz is 5 MHz
 - The standard split for 470 to 512 MHz is 3 MHz
- Usage
 - Analog, digital or mixed mode
 - Conventional or trunked
 - Repeater, base, mobile

Unit 5:
Frequency Regulations and Usage

Visual 5-20

Key Points

- UHF Paired Frequencies
 - UHF is allocated in pairs
 - 9 MHz separation—Federal allocations
 - Bandwidth between TX and RX pair
 - The standard split for 420 to 470 MHz is 5 MHz
 - The standard split for 470 to 512 MHz is 3 MHz, corresponding to half of a TV channel (6MHz)
 - All modes of transmission (analog or digital)
 - All forms of system design (conventional or trunked)
 - All form factors (repeaters, base stations, mobiles, portables)

Topic Narrowband – VHF/UHF

Narrowband – VHF/UHF

- **FCC Deadline – December 31, 2012**
 - Part 90 Land Mobile Radio Service including all public safety and business industrial land mobile radio systems (Amateur, Maritime Mobile services are exempt as well as paging-only channels)
 - VHF band 150-174 MHz and 421-512 MHz
 - Convert
 - From 25 kHz bandwidth channels to 12.5 kHz bandwidth channels
 - (Or equivalent voice talk paths – one per 12.5 kHz)

Unit 5:
Frequency Regulations and Usage

Visual 5-21

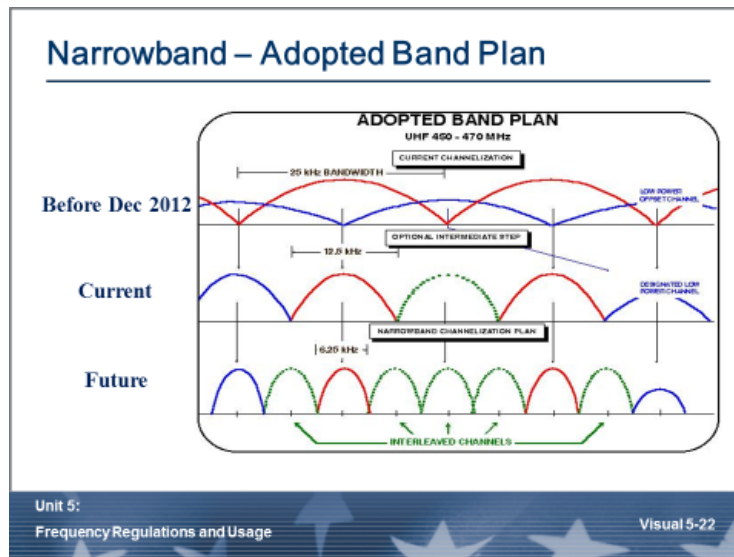
Key Points

- Paging-only channels - Public Safety paging channels 152.0075 MHz and 157.450 MHz are exempt
- Amateur Service
- Maritime Mobile service

VHF Band 150-174 MHz and 421-512 MHz Convert

- From 25 kHz bandwidth channels to 12.5 kHz bandwidth channels
- (Or equivalent voice talk paths – one per 12.5 kHz)

Topic Narrowband – Adopted Band Plan

**Key Points**

The radio spectrum is a finite amount of space.

- As technology improves more and more people are using radio waves. The narrowband plan was a way to allow more people to use radios without interfering with each other and still use the same amount of spectrum.

Topic

800 MHz

800 MHz

- Part of UHF band
 - 806-824 MHz/851-869 MHz prior to rebanding, 806-815 MHz/851-860 after rebanding
 - Paired channels – 45 MHz separation
 - Mobile channel loading requirements trunked or conventional

Unit 5:
Frequency Regulations and Usage

Visual 5-23

Key Points

- Part of the UHF band which is 300 – 3000 MHz
- Primarily trunked operations
- Frequencies allocated by Regional Planning Committee (RPC) plans
- Some general pool frequencies not allocated by RPCs
- Good building penetration, but reduced range compared to VHF and UHF

Topic 800 MHz (cont'd)

800 MHz (cont'd)

- 800 MHz is split into two bands
 - 806/851.0125 – 808/853.9875 NPSPAC managed
 - 809/854 – 815/860 General Pool
 - NPSPAC channels are 25 KHz channels spaced every 12.5 KHz
 - NPSPAC non-P25 usage recommended deviation should not exceed 4 KHz to protect adjacent channels
 - 8CALL/8TAC may use a 5 KHz deviation

Unit 5:
Frequency Regulations and Usage

Visual 5-24

Key Points

800 MHz (cont'd)

For FCC licensees, the non-Federal National Interoperability Channels VCALL10-VTAC14 and VTAC33-38, UCALL40-UTAC43D, the 800 MHz interoperability channels, and 8CALL90-8TAC94D are covered by a “blanket authorization” from the FCC: “Public safety licensees...can operate mobile units on these interoperability channels without an individual license.”

Topic 800 MHz (cont'd)

800 MHz (cont'd)

- Usage
 - Analog or digital
 - Not limited to P25 digital
 - Conventional or trunked
 - Repeater, base, mobile

Unit 5:
Frequency Regulations and Usage

Visual 5-25

Key Points

800 MHz (cont'd)

This band supports:

- All modes of transmission (analog or digital)
- All forms of system design (conventional or trunked)
- All form factors (repeaters, base stations, mobiles, portables)

Topic 800 MHz (cont'd)

800 MHz (cont'd)

- 5 dedicated interoperability channels (8Call/8TACs)
- General and Regional planning channels
 - Normal coordination/licensing
- RPC (Regional Planning Committee) channels
 - Pre-allocated – coordination by local RPC
 - Rebanding (NEXTEL interference)

Unit 5:
Frequency Regulations and Usage

Visual 5-26

Key Points

800 MHz (cont'd)

As we progressed, developing newer equipment capable of using high frequencies, we learned from past mistakes. Realizing one is not an island, and we all need help from time to time, this is the first time we dedicated 5 interoperability channels for use nationwide.

Taking a play from the amateur band created RPC to aid in coordination use to prevent interference

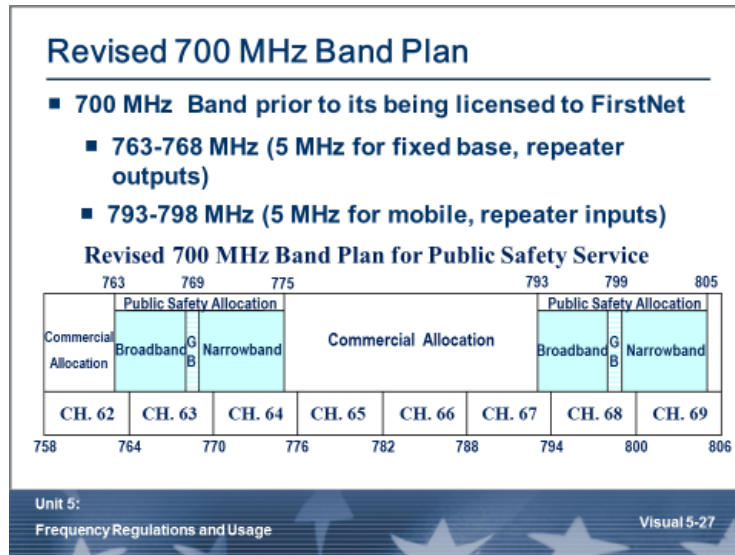
Rebanding - Why did we need it? As LMR moved into the 800 MHz spectrum, new technology was developed; cellular telephones. Cellular technology provides a similar service to LMR but in a completely different way.

LMR uses few high sites with high power and no interference is acceptable

Cellular uses multiple low sites with low power and is designed with acceptable interference

When cellular was activated throughout the nation, the RF noise floor increased and LMR users found their systems, which were capable of transmitting and receiving 50 miles yesterday, suddenly wouldn't work past 10 miles. To prevent interference, NEXTEL created a plan where all cellular systems would move up in spectrum and LMR systems would move down with a band between to prevent the LMR receivers from being desensitized. NEXTEL offered to pay two billion dollars to help pay for the move.

Topic Revised 700 MHz Band Plan



Key Points

In July 2007, the Federal Communications Commission (FCC) revised the 700 MHz band plan and service rules to promote the creation of a nationwide interoperable broadband network for public safety and to facilitate the availability of new and innovative wireless broadband services for consumers. The Commission designated the lower half of the 700 MHz Public Safety Band (763-768/793-798 MHz) for broadband communications. The Commission also consolidated existing narrowband allocations to the upper half of the 700 MHz Public Safety block (769-775/799-805 MHz). Further, in order to minimize interference between broadband and narrowband operations, the Commission adopted a one megahertz guard band (768-769/798-799 MHz) between the public safety broadband and narrowband segments. Finally, the Commission established a single nationwide license – the Public Safety Broadband License – for the 700 MHz public safety broadband spectrum.

This is all prior to the Middle Class Tax Relief and Job Creation Act of 2012 that created FirstNet

Topic 700 MHz NB

700 MHz NB

- 700 MHz Narrowband Channels
 - 769-775 MHz (Old TV band channels 63 and 64)
 - 799-805 MHz (Old TV band channels 68 and 69)
 - All 700 assignments are narrowband or ultra-narrowband
 - Mandated P25 Phase I Common Air Interface (CAI) digital emissions with a few exceptions for 12 low-power analog pairs
 - Dedicated Interoperability channels (32 channel pairs that also provide “talk-around” capability)

Unit 5:
Frequency Regulations and Usage

Visual 5-28

Key Points

- Adjacent to 800 MHz public safety band
- Digital requirement
- Dedicated interoperability channels (P25 CAI required)
- Original channelization shifted to address changes to 700 Broadband Rule changes
- Performance similar to 800 MHz

Topic 700 MHz NB (cont'd)

700 MHz NB (cont'd)

- 6.25 kHz equivalency (Frequency-Division Multiple Access [FDMA] versus Time-Division Multiple Access [TDMA])
 - Temporary 12.5 kHz authorization
- General – RPC channels
 - Pre-allocated – coordination by local RPC
- “State” – licensed frequencies
 - Coordinated by State entity

Unit 5:
Frequency Regulations and Usage

Visual 5-29

Key Points

- Adjacent to 800 MHz public safety band
- Digital requirement
- Dedicated interoperability channels (P25 CAI required)
- Original channelization shifted to address changes to 700 Broadband Rule changes
- Performance similar to 800 MHz

Topic 700 MHz NB (cont'd)

700 MHz NB (cont'd)

- 700 MHz narrowband channels are managed by the 55 National Public Safety Planning Advisory Committees (NPSPAC)
- 2 Nationwide Calling channel pairs, 26 Tactical channel pairs, 2 Data channel pairs, 2 Mobile Repeater pairs managed by State SIEC or RPC
- Low power analog channels have 2 watt limitation
- State License Channels managed by the States unless relinquished to the RPC

Unit 5:
Frequency Regulations and Usage

Visual 5-30

Key Points

- Realizing five interoperability channels are not enough during a large incident, 32 nationwide channels were reserved in the band.
- Channel pairing was set at 30 MHz separation
- State licensed channels are managed by the state where they know the user's requirements
- This is the first time a transmission mode was designated
 - Everything must use P25 phase 1 narrowband common air interface
 - Performance similar to 800 MHz

Topic 700 MHz NB (cont'd)

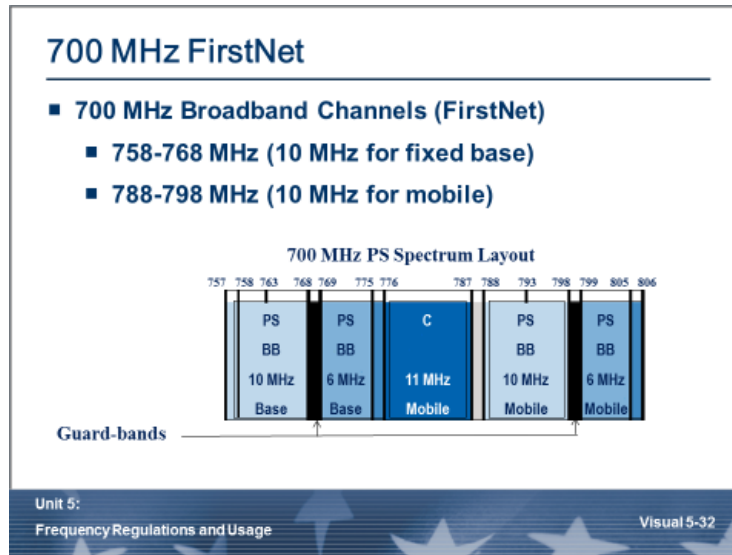
The slide is titled "700 MHz NB (cont'd)" and contains a bulleted list under the heading "Usage". The list items are: "P25 digital with the exception of the low power channels", "Conventional or trunked", and "Repeater, base, mobile". The slide has a blue footer with the text "Unit 5: Frequency Regulations and Usage" on the left and "Visual 5-31" on the right.

Key Points

This band supports:

- P25 digital with the exception of the low power channels
- All forms of system design (conventional or trunked)
- All form factors (repeaters, base stations, mobiles, portables) This is the first time a transmission mode was designated

Topic 700 MHz FirstNet



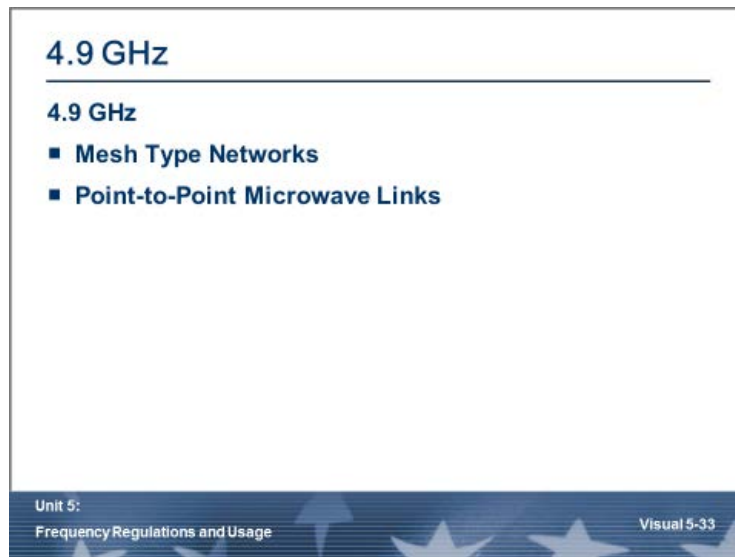
Key Points

With the passage of the Middle Class Tax Relief and Job Creation Act of 2012 (Spectrum Act), some existing public safety licenses in the 700 MHz Band and an additional license (known as the D Block), together totaling 22 MHz, have been designated by Congress to support a broadband communications network for public safety. As required by the act, the initial, 10-year license to use these frequencies was assigned by the FCC to FirstNet. It is renewable for an additional 10 years, on condition that FirstNet has met its duties and obligations under the act.

A total of 34 MHz of spectrum capacity available for public safety networks within the 700 MHz band: the 20 MHz designated for broadband (data), 2 MHz guard-bands and 12 MHz allocated for narrowband communications (primarily voice).

Topic

4.9 MHz

**Key Points**

Discuss the merits and issues of 4.9 GHz.

A portion of the 4.9 GHz Band (50 MHz) was made available through FCC rules for Public Safety use. These uses include:

- Mesh type networks where multiple nodes operate as an area-wide network
- Point-to-point microwave links
 - Point-to-point links are frequently used on an itinerant basis to make data connections to mobile communications vehicles, video links to public safety aircraft and other incident related support

Topic Aviation Radio

Aviation Radio

- Exclusive use for aircraft
 - 108 MHz – 137 MHz
 - 225 MHz – 380 MHz (military)
 - AM modulation
- Extreme caution must be used in frequency use
- Must coordinate with Aviation management



Unit 5:
Frequency Regulations and Usage

Visual 5-34

Key Points

Air-to-air and air-to-flight control facilities:

- 108 MHz–136 MHz (civil and military aviation)
- 225 MHz–380 MHz (military aviation)
- AM modulation

Most emergency services aircraft include conventional FM public safety LMR channels appropriate to their area of operation

Protection of AIR-TO-GROUND channels is critical to safe air Operations


- Selection of FM frequency (LMR) is critical due to interference with adjacent systems (altitude of airplanes).
- Do not patch AM aviation frequencies without express approval of aviation management.

Topic Aviation Radio (cont'd)

Aviation Radio (cont'd)

- With appropriate licensing, may be used by ground mobile units for air-ground communications

Air-to-ground operations should be on public safety FM channels (per FCC rule 90.423)



Unit 5:
Frequency Regulations and Usage

Visual 5-35

Key Points

Air-to-air and air-to-flight control facilities:

- 108 MHz–136 MHz (civil and military aviation)
- 225 MHz–380 MHz (military aviation)
- AM modulation

Most emergency services aircraft include conventional FM public safety LMR channels appropriate to their area of operation.

- ***Protection of AIR-TO-GROUND channels is critical to safe air Operations.***
- Selection of FM frequency (LMR) is critical due to interference with adjacent systems (altitude of airplanes).
- Do not patch AM aviation frequencies without express approval of aviation management.

Topic Analog vs. Digital Radio

Analog Versus Digital Radio

- Analog radios use Frequency Modulation (FM) for Land Mobile Radio applications
- Susceptible to noise and sometimes noise can override intended traffic
- Usually users will know there is someone calling
- Gradual decay of signal quality versus distance

Unit 5:
Frequency Regulations and Usage

Visual 5-36

Key Points

Analog (FM modulation) is the mainstay of historical public safety radio systems.

- Most established systems use analog
- Susceptible to noise – worse at low band, less at upper UHF
- Usually has some minimal indication of a transmission
- Gradual decay of signal in fringe areas of operation

Topic Analog vs. Digital Radio (cont'd)


Analog Versus Digital Radio (cont'd)

- Digital radio uses a vocoder to convert human voice into digital symbols for compression purposes
- Digital users either hear clear traffic or hear nothing
 - Sharp fringe area drop-off
 - Several studies have questioned the reliability of digital in high noise environments, such as fire ground operations (IAFC report link)

<http://www.iafc.org/displaycommon.cfm?an=1&subarticlenbr=719>

Note: Problem solved in second version of the vocoder

- Signal blocking by unintended third party transmission in conventional digital usage



Unit 5:
Frequency Regulations and Usage

Visual 5-37

Key Points

- Digital vocoder converts analog audio to digital format.
- Consistent quality out to fringe with rapid drop of signal Bit error rate.
- High ambient noise environments may tend to “confuse” the vocoder and cause poor performance in areas such as fire ground operations
- IAFC Report on Fire Ground Noise link:
- <http://www.iafc.org/displaycommon.cfm?an=1&subarticlenbr=719>
- May drop a desired signal in the presence of a “hidden” third-party transmitter where an alternate transmitter (or channel) keys up.

Topic

Trunking



Trunking

- Trunked radio systems differ from conventional
- Trunked systems have a number of frequencies pooled into one system
- Primary difference is the use of “talkgroups” instead of discrete frequencies
- Each transmission is between talkgroups and is moved between frequencies as frequencies are available
 - Dynamic frequency assignments
 - Channel loading is based on probability

Unit 5: Frequency Regulations and Usage Visual 5-38

Key Points

Typically 800 MHz (700 MHz), UHF and VHF high band trunking is growing.

Dissimilar vendor systems are often incompatible due to proprietary features.

- Greater number of potential talk paths than available frequencies due to the statistical probability length of given radio calls and the statistical availability of frequencies
- Number of simultaneous calls limited to the total number of talkpaths available on a given trunked site
- Quality usually indicated by the number of “busy” indications
- Systems are typically scaled for very few “busies”
- Interoperability talkgroups should be pre-defined in local/regional systems and part of system pre-planned fleet mapping
- Trunking is based on the theory of probability; there is no guarantee of access in congested time periods

How long has trunking existed?

Trunking has been used in the telephone systems since 1923 to share a limited number of lines. Telephone company interoffice lines were referred to as “trunk lines.”

How does a trunked talkgroup work?

User A wants to contact all of the units in his/her talkgroup. The Push-to-Talk (PTT) is keyed, which causes the radio to send a short burst of data to the control channel repeater.

This data identifies the caller attributes and enters a channel request to the system controller. User A's radio then switches to receive mode to await a data response from the controller. Upon receipt of the request, the system controller attempts to select an available voice channel.

If a voice channel is available, the system controller sends a data message over the control channel switching all units in User A's talkgroup to the available voice channel. Only units in this particular talkgroup are automatically switched to the assigned channel. When User A starts talking, all the members of the talkgroup will hear the conversation. This preempts any other use of that assigned channel for the duration of the call.

Topic Trunking (cont'd)

Trunking (cont'd)

- **When was trunking invented?**
- **Talkgroups capacity enhanced by probability of channel availability**
 - **Instantaneous capacity is limited to the actual frequency capacity**
- **Fleet mapping should include interoperability talkgroups**

Unit 5:
Frequency Regulations and Usage

Visual 5-39

Key Points

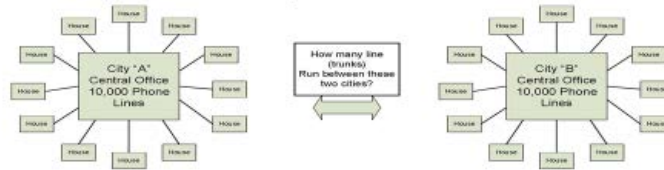
Trunking was invented in 1923 by AT&T.

Topic

How Many Lines Run Between the Two Cities?

How Many Lines Run Between the 2 Cities?

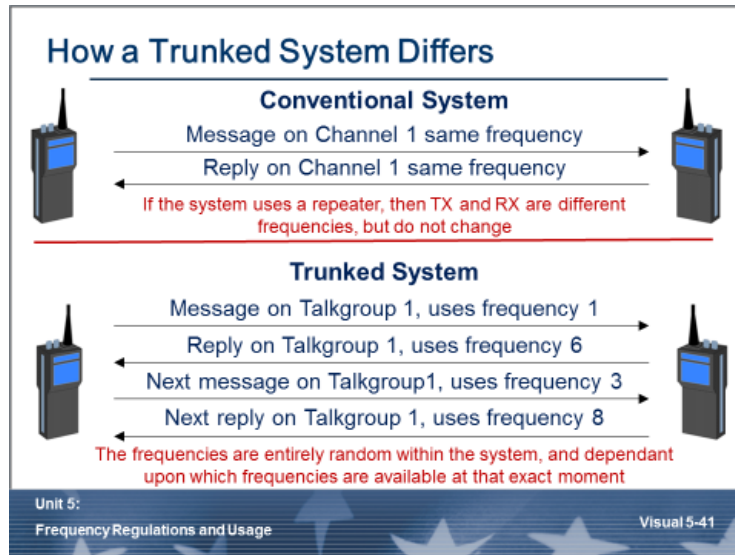
- The answer is very few, possibly as few as 20. This is based upon the probability that a very small percentage of the City "A" population will want to talk to the City "B" population at the same time (Erlang Theory)
- This is the exact same theory used in Trunked radio, a large number of users sharing a small number of trunked channels, making the utilization very efficient



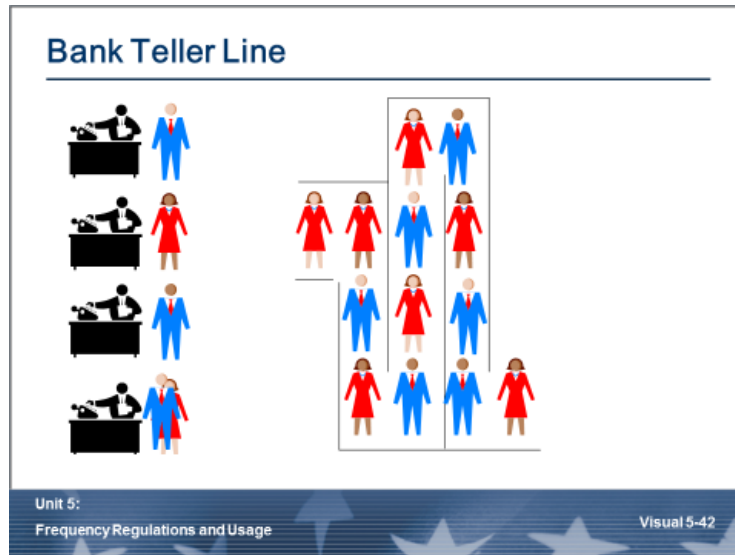
Unit 5:
Frequency Regulations and Usage

Visual 5-40

Key Points

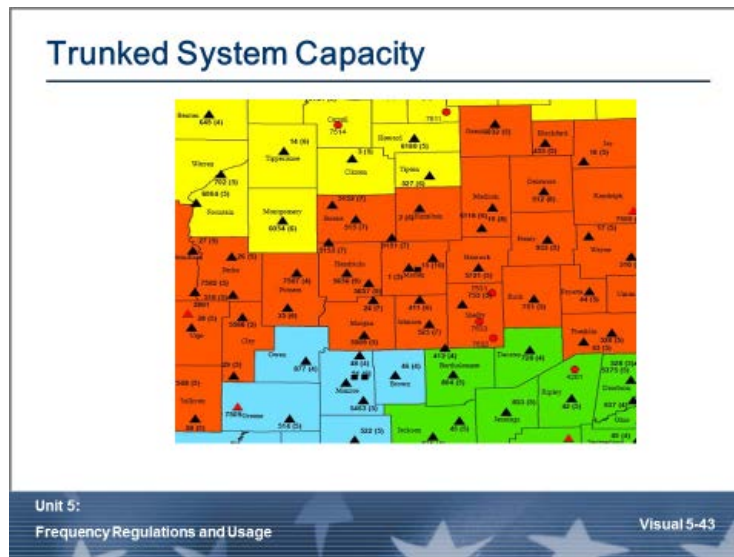
Topic How a Trunked System Differs**Key Points**

Topic Bank Teller Trunking Analogy



Key Points

Topic Trunked System Capacity



Key Points

Talkgroups do not equal talkpaths. A given site will contain a fixed number of available talkpaths. A COML should understand system architecture in order not to overload a site. This diagram depicts site locations followed by the number of talkpaths available in parentheses.


Shared channels are good, but scanning can be a mess. To avoid these problems, it can be recommended to not allow scanning.

Topic Interference

Interference

This issue becomes bigger every day

- Mechanical interference – rusty bolts, bad grounds
- Broadband noise
- Inter-modulation (transmitter mixes)
- Co-channel – on frequency
- Adjacent channel – near frequency
 - Try to identify the offending station by monitoring; listen for call signs or geographical information to assist in locating the station



Be aggressive in eliminating interference. It can get worse at exactly the wrong time and compromise operations

Unit 5:
Frequency Regulations and Usage

Visual 5-44

Key Points


How does interference affect radio communications?

- Congestion causes increased interference
- Licensed spectrum users
- Ambient commercial and industrial noise sources
 - Computers
 - Industrial systems (RF gluing, computer control)
- High power transmitters—near field overload
- Intermodulation (Intermod)— mixing of various frequencies
 - Direct frequency mixes in transmitters
 - Rusty bolts, fences
- Bidirectional amplifiers (BDAs)
- Digital TV over-the-air antenna amplifiers
 - Self-oscillation
- Co-channel (same frequency-different user)
- Adjacent channel—near frequency

Topic Interference (cont'd)

Interference (cont'd)

- First choice may be to contact the agency or licensee directly, and try to find out if they changed something recently, such as antennas or power output
- Most public safety agencies will cooperate to rectify interference
- The FCC may also be of assistance finding the offending station
- Make contact; operator information can be obtained via the FCC Universal Licensing System (ULS) database
<http://wireless.fcc.gov/uls/>



Unit 5:
Frequency Regulations and Usage

Visual 5-45

Key Points

Actions that can be taken to identify and eliminate interference:

- Direct “on frequency” interference
 - Attempt to contact licensees directly
- In extreme cases, the FCC may be able to assist in identifying dedicated interference sources
- Proper installation practices can help prevent interference
- FCC database may help to identify sources

With the exception of licensed trunked systems, the FCC classifies all other frequencies as “shared” without legal recourse to exclusivity.

Topic Willful Interference

Willful Interference

- This is a criminal act; involve the FCC and law enforcement early in the process
- Willful interference can be a more pervasive problem, depending upon the motive of the perpetrator and their skill level
- The station may be moved to prevent easy detection
- They may or may not identify themselves
- The FCC, radio shops, and amateur radio operators may all be of assistance solving this problem

Unit 5:
Frequency Regulations and Usage

Visual 5-46

Key Points

Willful interference can be hard to track, some interferers will even identify themselves, but they tend to be fairly sophisticated and move around to prevent getting caught.

This is a criminal act! Involve the FCC and law enforcement early on in the process. Willful interference can be a more pervasive problem, depending upon the motive of the perpetrator and their skill level. The station may be moved to prevent easy detection. They may or may not identify themselves. The FCC, radio shops, and amateur radio operators may all be of assistance solving this problem.

Topic Tone-Coded Squelch

Tone-Coded Squelch

- **Continuous Tone-Coded Squelch System**
 - Analog sub-audible frequency tone continuously transmitted
 - 42 standard tones ranging from 67.0 Hz to 254.1 Hz
 - Provides protection from errant on-frequency RF signals
 - Radio will not open audio without the presence of the required tone
 - Particularly required for repeater operations to control repeat function
- **DCS – Digital-Coded Squelch**
 - Equivalent to analog CTCSS but uses low speed data at 134.4 bits per second – over 100 codes
 - The P25 Network Access Code (NAC) performs a similar function to CTCSS

Unit 5:
Frequency Regulations and UsageVisual 5-47

Key Points

Continuous Tone-Coded Squelch System (CTCSS)

- Analog sub-audible frequency tone continuously transmitted
- Excluding CSQ, 42 standard tones ranging from 67.0 Hz to 254.1 Hz
- Provides protection from errant on-frequency RF signals
 - Radio will not open audio without the presence of the required tone
 - Particularly required for repeater operations to control repeat function
- Private Line (PL), Channel Guard (CG), Quiet Talk (QT), Quiet Channel (QC), Tone Guard (TG), and Tone Lock (TL), are all manufacturer-specific names for the CTCSS function

Digital-Coded Squelch (DCS)

- Equivalent action as analog using digitally encoded 134.4 Hz sub-audible tone
- P25 uses a digital equivalent of tone code squelch

Topic Radio Programming**Key Points**

Requirements for Programming Modern Radios

Virtually all modern radios are software-controlled to some degree.



- Programming requires:
 - Laptop with a Radio Interface Box (RIB)
 - Cloning cables to duplicate a similar make/model radio by directly loading configuration data from a master unit to a slave unit
- Logistical considerations:
 - Training of users (what channel, where)
 - Obtain system manager's authorization to alter radio programming
 - Logging program parameters
 - De-programming radios as required at the end of the incident
 - Retain copy of original program

Ensure programming software versions are the same. Programming a radio with a newer version of software than what is currently on the radio may prevent the radio from being reprogrammed with the older version.

Topic Portable Repeaters

Portable Repeaters

- **Transportable**
 - Repeat mode
 - Relay mode



Unit 5:
Frequency Regulations and Usage

Visual 5-49

Key Points

Basic transportable repeaters:

- Mobile—Vehicle-mounted
- Transportable—Hand-carry (for example, helicopter, boat transport)

Topic NIFOG – Resource

NIFOG – Resource

National Interoperability Field Operations Guide (NIFOG)
- reference guide to

- **Rules and regulations**
- **Interoperability channels**
- **Operational contact info**
- **Technical information**

NIFOG is NOT

- **A teaching guide**
- **A license to transmit**
- **An Incident Radio Communications Plan**



Unit 5:
Frequency Regulations and Usage

Visual 5-50

Key Points

Great technical resource, the contents of the National Interoperability Field Operations Guide (NIFOG) include:

- Common interoperability channel lists
- Common used frequency lists
- Miscellaneous technical references
- Contact numbers

Topic NIFOG – Resource (cont'd)

NIFOG – Resource (cont'd)

Rules and Regulations

- Different rules for state, local, tribal, territorial governments (FCC) vs. Federal Government (NTIA)
- Some channels are authorized by rule, some require individual licensing

Unit 5:
Frequency Regulations and Usage

Visual 5-51

Key Points

- Rules and Regulations
- When can the frequencies be use?
 - Mobile and portable during times of emergency
 - Fixed repeaters require a license

Topic NIFOG – Resource (cont'd)

NIFOG – Resource (cont'd)

Interoperability Channels

- **National Interoperability Channels (FCC rules)**
- **Federal Interoperability Channels (NTIA rules)**
- **Mutual Aid Channels – require FCC License or NTIA Authorization**
- **Conditions on license can limit availability, e.g. near Canadian border**

Unit 5:
Frequency Regulations and Usage

Visual 5-52

Key Points

- Common interoperability channels: national and federal.
- Conditions on license can limit availability, e.g. near Canadian border.

Topic NIFOG – Resource (cont'd)

NIFOG – Resource (cont'd)

Operational Info

- National-level Operations Centers
- Emergency Support Functions (ESF) at FEMA HQ
- FEMA Regional Offices
- USCG Rescue Coordination Centers

Unit 5:
Frequency Regulations and Usage

Visual 5-53

Key Points

Topic NIFOG – Resource (cont'd)

NIFOG – Resource (cont'd)

Technical Info

- CTCSS, DCS, NAC
- Connectors: DB25, DE9, RJ45
- Non-routable IP Address Ranges
- Telco Wiring Color Codes
- Satellite Phone Dialing, WPS, GETS
- Aviation and Maritime Channels
- State Government (Part 90) HF Channels

Unit 5:
Frequency Regulations and Usage

Visual 5-54

Key Points

Topic NIFOG – Resource (cont'd)

NIFOG – Resource (cont'd)

- Downloadable versions and hard-copy request form are in the “NIFOG Info” section at <http://publicsafetytools.info>
- Downloadable file “Programming Template” – ICS-217A of all interop channels

Unit 5:
Frequency Regulations and Usage

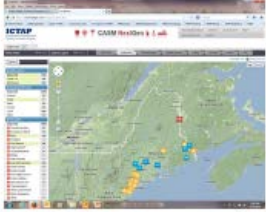
Visual 5-55

Key Points

Topic CASM NextGen

Other Interoperability Planning Tools

- Communication Assets Survey and Mapping Tool Next Generation (CASM NextGen)
 - Designed as a strategic planning tool, but has tactical use and utility
 - Password access is granted through a local area manager
- Tactical Interoperable Communications Plan (TICP)
- Other regional plans and field guides



Unit 5:
Frequency Regulations and Usage

Visual 5-56

Key Points

Topic Communications Interoperability

Communications Interoperability

- One of the most misunderstood terms
- Does not mean everyone is speaking to everyone else
- Must be carefully managed to avoid mass confusion
- Extremely easy to overload a system



Unit 5:
Frequency Regulations and Usage

Visual 5-57

Key Points

Communications interoperability is the ability of public safety service and support providers to communicate with staff from other responding agencies, to exchange voice and/or data communications as required, on demand and in real-time, as authorized.

- Communications interoperability is not a party-line
- Common mission, common area
- Interoperability might or might not be a priority

Keep it simple! Complex fixes increase risks and vulnerabilities.

Topic Interoperability Channels

Interoperability Channels

- **National Interoperability Channels:**
 - **VHF: 1 Calling, 4 Tactical, and 6 Tactical Repeater**
 - **Calling: VCALL10**
 - **Tactical: VTAC11, VTAC12, VTAC13, VTAC14**
 - **Tactical Repeater: VTAC33, VTAC34, VTAC35**
 - **Tactical Repeater: VTAC36, VTAC37, VTAC38**
 - **UHF: 1 Calling and 3 Tactical**
 - **Calling: UCALL40**
 - **Tactical: UTAC41, UTAC42, UTAC43**

Unit 5:
Frequency Regulations and Usage

Visual 5-58

Key Points

VCALL and VTACs, UCALL, and UTACs are narrowband assignments. There are wideband interoperability channels available.

The VTAC repeater channels use two of the VTAC tactical channels to create a repeater pair.

Topic Interoperability Channels (cont'd)

Interoperability Channels (cont'd)

- **National Interoperability Channels:**
 - **800 MHz: 1 Calling and 4 Tactical**
 - **Calling: 8CALL90**
 - **Tactical: 8TAC91, 8TAC92, 8TAC93,**
 - **700 MHz band: 32 interop repeater pairs listed in the NIFOG**

Note: A “D” appended to the channel name denotes direct / Talk-around channel

Unit 5:
Frequency Regulations and Usage

Visual 5-59

Key Points

Topic Local Use Agreements

Local Use Agreements FCC rule 90.421

- These are agreements for one agency to use another agency's system for a specific purpose
- These agreements are limited, are not in lieu of licensing, and are usually associated with mutual aid, use of gateways, or other special uses



Unit 5:
Frequency Regulations and Usage

Visual 5-60

Key Points

These are agreements to allow one agency to use another agency's radio system without requiring the first agency to license the channel. They can only be granted within the footprint of the license that has been issued. The agency with the license can revoke a local use agreement at any time. These agreements should be in writing.

This is not designed to replace the license requirements. You can only agree to the terms of your license, especially related to your licensed area of operation. You cannot authorize use outside of the terms of your FCC license. These should be written agreements. Agreements do not need to be complex.

Topic Special Temporary Authorizations

Special Temporary Authorizations

- It is possible to receive a Special Temporary Authorization to use a frequency
- These are obtained from the FCC licensees
- This is not to be used in lieu of normal licensing procedures
- More information at:
<http://www.fcc.gov/pshs/services/sta.html>

Unit 5: Frequency Regulations and Usage Visual 5-61

Key Points

When do you want to do this?

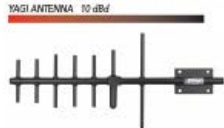
- These are obtained from the FCC licensees; see FCC rule 1.931
- Stations authorized by NTIA see NTIA Manual section 8.3.32
- These are used generally for fixed systems during system failures, not typically used for planned events or exercises.
 - They are allowed for emergencies involving danger to life and property
 - Informal application may be used
 - Grants are typically for 6 months

If you do need one, they are not difficult to get. Generally you can do this online. Be prepared to provide name and address of the applicant agency, the location of the proposed installation or area of operations, and the nature of the emergency.

Topic RF Exposure

RF Exposure

- RF Exposure can harm human tissue
- Typically not an issue with the relatively low power and relatively low frequency equipment used in Public Safety
- RF hazards analysis required for FCC license applications and OSHA workplace safety
- Can be an issue with high-power base stations



Unit 5:
Frequency Regulations and Usage

Visual 5-62

Key Points

Humans can be at risk from RF exposure. Be wary of high power transmitters—they can cause human harm, particularly radar and broadcast antennas.

Found at high-power broadcast and military and aviation radar facilities, higher frequency emissions are the cause of more damage, typically to soft tissue such as the eyes.


Directional antennas such as dishes and Yagi antennas produce more focused energy.

Consult with radio engineering professionals for Maximum Permissible Exposure (MPE) evaluations for fixed high-power stations.

Topic RF Exposure

RF Exposure (cont'd)

- Easiest protection is distance; RF exposure drops off very quickly
- High power broadcast (AM, FM, or TV) and radar antennas are the most hazardous
- If in doubt, get an engineer to evaluate your situation



Unit 5:
Frequency Regulations and Usage

Visual 5-63

Key Points

Exposure level drops by 75% or more each time the distance from the transmitter is doubled.

FCC Encyclopedia - Radio Frequency Safety <http://www.fcc.gov/encyclopedia/radio-frequency-safety>

OET Bulletin 56 Questions and Answers about Biological Effects and Potential Hazards of Radio frequency Electromagnetic Fields

http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/oet56e3.pdf

OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields

http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet65/oet65.pdf

FM Model for Windows Software Program

<http://www.fcc.gov/oet/info/software/fmmodel/>

Topic

Exercise 5



Key Points

Topic Objectives Review

Objectives Review

1. *What are the factors influencing frequency coordination efforts?*
2. *Describe local use agreements and special temporary authorizations.*
3. *What are considerations in recognizing and preventing interference?*
4. *What are the modes of typical types of radio systems in use today?*
5. *Describe the Public Safety spectrum bands.*
6. *Identify issues related to RF safety.*

Unit 5:
Frequency Regulations and Usage

Visual 5-65

Key Points

Unit Terminal Objective

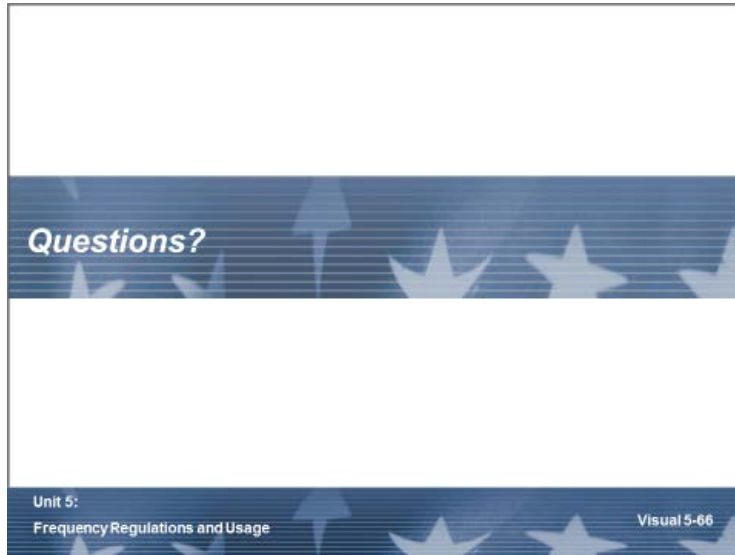
At the end of this unit, students will be able to identify methods and standards relating to frequency regulations and use.

Unit Enabling Objectives

- Identify the factors influencing frequency coordination efforts
- Understand local use agreements and special temporary authorizations
- Identify and describe considerations in recognizing and preventing interference
- Identify modes of typical types of radio systems in use today
- Describe the Public Safety Spectrum Bands
- Identify RF safety issues

Topic

Questions



Key Points

Unit 6: Incident Communications Systems

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Describe the Communications Unit Leader responsibilities in establishing an incident radio communications system
- Describe use of command and tactical nets
- Identify requirements for establishing an incident radio communications system
- Describe specific communication information gathered
- Evaluate needs and order supplies, materials, and personnel to keep unit operating

Methodology

This unit uses lecture, discussion based activities, and exercises.

Knowledge of unit content will be evaluated through administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of exercise 6.

The purpose of exercise 6 is to provide the participants with an opportunity to order supplies, personnel, and equipment on the ICS Form 213 - General Message. This exercise will also provide the participants with an opportunity to identify the pros and cons of specific tracking systems for accountability purposes during an incident. This exercise is scheduled to last approximately 45 minutes, including small group discussions and presentation of group findings.

The purpose of this unit is to provide students with an understanding of the Communication Unit Leader's responsibility for developing an incident radio communications plan for interoperable communications on an incident or event as well as the communications system to implement the plan.

Time Plan

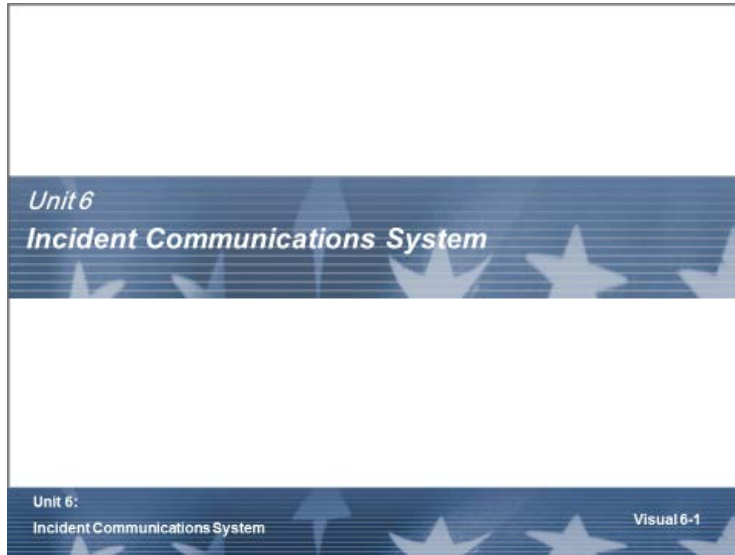
A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	1 hour, 30 minutes
Exercise 6	45 minutes
Total Time	2 hours, 15 minutes

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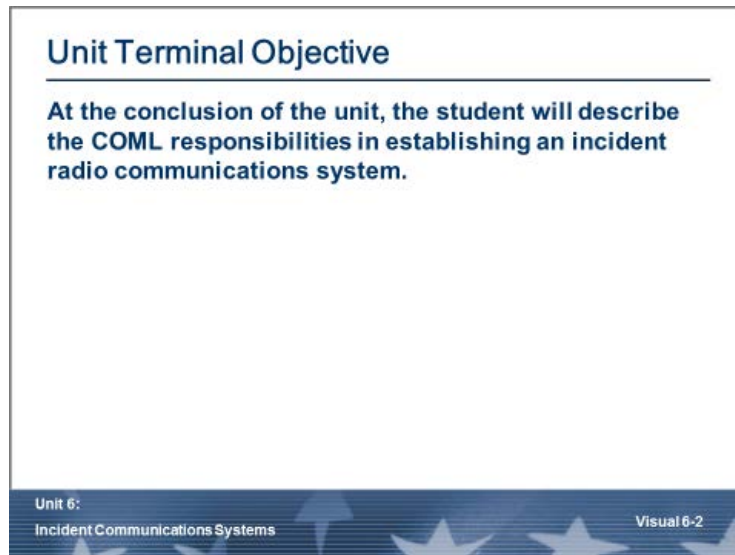
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective



Key Points

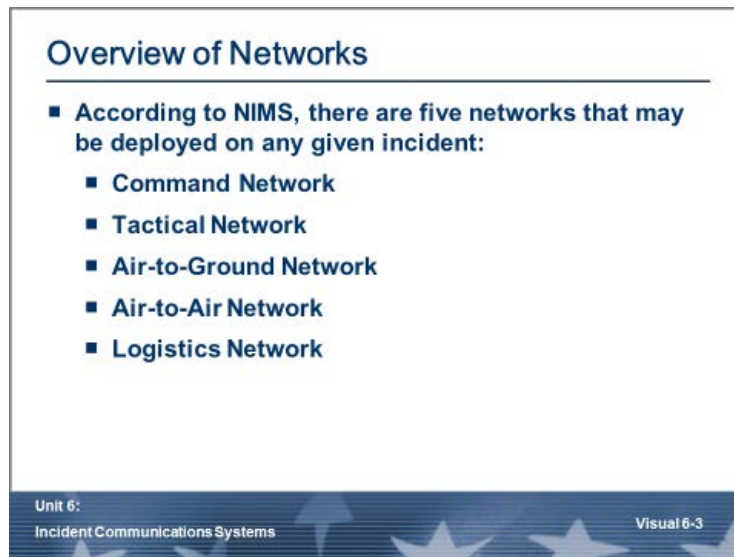
Unit Terminal Objective

At the conclusion of the unit, the student will describe the Communications Unit Leader's responsibilities in establishing an incident radio communications system.

Unit Enabling Objectives

- Describe use of command and tactical nets
- Identify requirements for establishing an incident radio communications system
- Describe specific communication information gathered
- Evaluate needs and order supplies, materials, and personnel to keep unit operating

Topic Overview of Networks

**Key Points**

According to NIMS, there are five networks that may be deployed on any given incident:

- Command Network may be used by C&G Staff
 - More often it is a coordination channel for the Operations Section
- Tactical Networks are used by the Operations Section to execute incident response
- Air-to-Ground Network is used to coordinate air support
- Air-to-Air Network is used to communicate between aircraft
 - It is typically not within the purview of the Communications Unit Leader, but it is coordinated by the Air Branch
- Logistics Network (sometimes known as the Support Network) is used by the Logistics Section to coordinate functions such as supply and data transmission

Topic Command Networks

Command Network

- **Command Network may be used by C&G Staff**
 - **More often, it is a coordination channel for the Operations Section**
 - **Usually only one command network is used during an incident**
- **May be patched via a gateway when personnel are on disparate radio systems**
- **Cache radios can be programmed for C&G Staff use**
- **Used as a link between the incident and the Dispatch Center**

Unit 6:
Incident Communications Systems

Visual 6-4

Key Points

- Cache radios or gateways may be desirable to overcome disparate systems
- Usually only one Command Net is used during an incident by the C&G staff
- The positions down to Division/Group Supervisors will likely need two radios, one on the Command Channel and one for tactical use
- Scanning may be a possibility, but it is a poor solution
- It may be patched via a gateway when personnel are on disparate radio systems
- Cache radios or radios can be programmed for command and general staff use
- This frequency/talkgroup is also used as a link between the incident and the Dispatch Center

Topic

Tactical Networks

Tactical Networks

- There may be several tactical networks at the Division/Group level
- Use caution when patching Tactical Networks; monitor them carefully

What are some examples of tactical networks?

Unit 6:
Incident Communications Systems

Visual 6-5

Key Points

There may be several tactical networks at the Division (geographic)/Group (function) level that may use mobile communications units at the incident to patch tactical networks.

Usually they are the most challenging to design because they have to consider all tactical requirements.

Tactical networks may require mobile communications units to follow tactical units or to provide patches. They should not be patched together, except as a last resort, because operational needs require consistency in radio systems to avoid problems.

Topic Tactical Interoperability

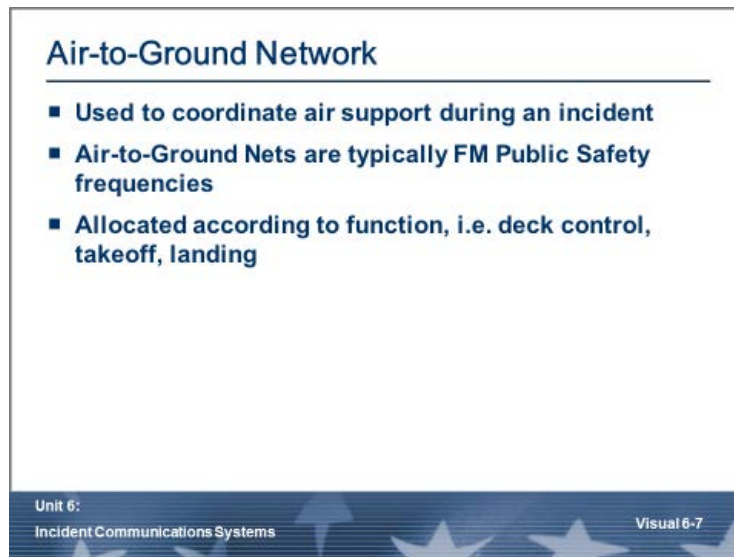
Tactical Interoperability

<ul style="list-style-type: none">■ Fire■ Law Enforcement■ Emergency Medical Services■ Hospitals■ Emergency Management■ Explosive Ordnance Disposal■ HAZMAT■ Urban Area Search and Rescue Teams (USAR)■ Transportation (Public and Private)■ Utilities	<ul style="list-style-type: none">■ Public Works■ Public Health■ Military■ DHS■ Schools■ Environmental Health■ Medical Examiner■ Radiological Support■ Nongovernmental Organizations (NGOs) such as the Red Cross
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Unit 6:
Incident Communications SystemsVisual 6-6

Key Points

Topic Air-to-Ground Networks

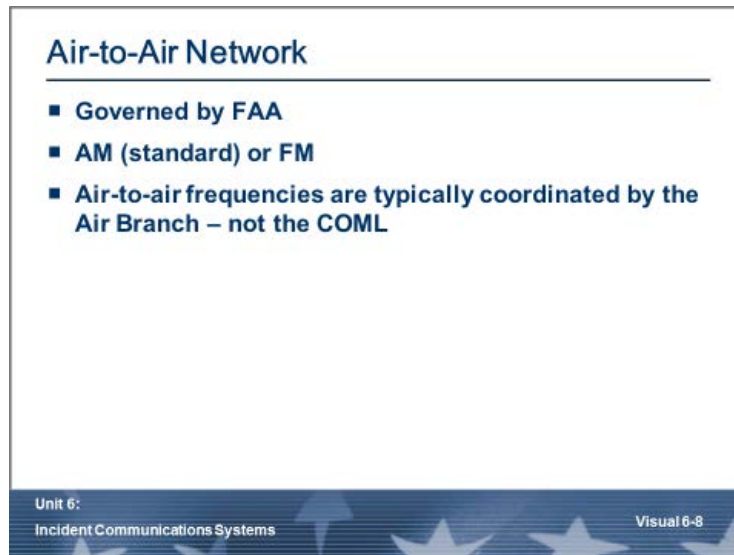
**Key Points**

An air-to-ground network is used to coordinate air support during an incident.

This usually involves a number of frequencies and modulations dedicated to specific functions such as deck frequencies, or takeoff and landing control.

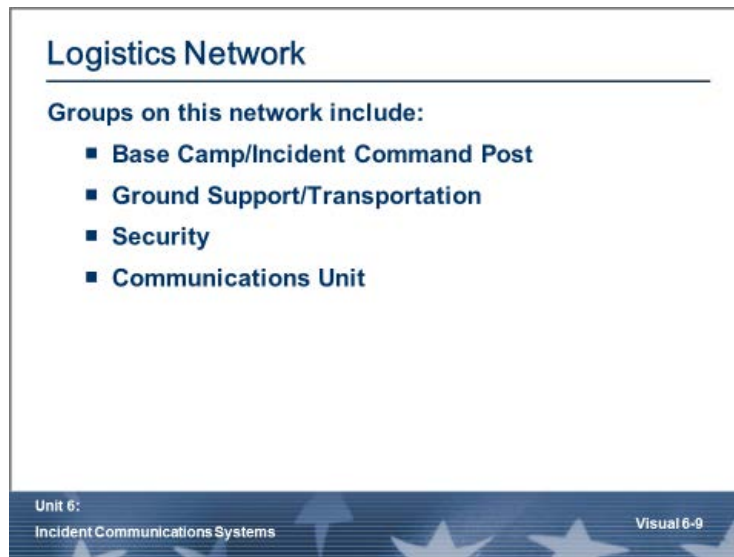
Caution should be used in assigning air-to-ground frequencies. Not all frequencies are suitable for high-altitude use.

Topic Air-to-Air Network

**Key Points**

- Air-to-air channels may not be used by ground-based resources.
- The FAA does not allocate frequencies for people or incident teams to self-assign. The FAA maintains strict control over those frequencies in order to avoid interference that may cause an aircraft safety hazard.
- As a result, the COML cannot assign air-to-air frequencies. Instead, they must be ordered from the FAA. An ordering point at a local EOC will generally have contact information for the appropriate personnel at the FAA.
- If an incident is complex enough to require Air-to-Air, it is recommended the COML have someone on staff who is familiar with air-to-air technologies and programs.
- Examples of incidents requiring an air-to-air network include large searches, either search-and-rescue or law enforcement, or Katrina SAR.

Topic Logistics Network



Key Points

The logistics network can be a critical component to incident management and its importance should not be minimized. Essential support to the incident is predicated on logistical efficiency.

The Logistics Section may be geographically stable, and many Units within the Section do not require as many radio systems assets. More often, these Units require phone, fax, and Internet data links.

Based on the nature of the incident, the Logistics Net may be a large network. Groups on this network will include camps, security, staging, and transportation channels.

Topic Initial Priorities

Initial Priorities

- **Keep constant communications with the Communications POC**
- **The Communications Unit supports all aspects of incident management**
- **Priorities may not follow traditional expectations**

Is there something you can do to enhance existing systems while a definitive solution is being implemented?

Unit 6:
Incident Communications Systems

Visual 6-10

Key Points

The COML will have a number of priorities that require attention:

Is there something you can do to enhance existing systems while a definitive solution is being implemented?

Because of concurrent priorities, the Logistics Chief or Incident Commander may need to establish the order of priorities.

Constant communications must be kept with the Communications POC, especially if the area is unfamiliar.

Topic Designing Command Radio System

Designing Radio Systems

- Analyze radio needs
 - What is in place now? Will it suffice?
 - If not, perform an analysis to include:
 - GIS
 - Radio coverage software
 - Topographic maps/software
 - Physically survey terrain by ground/air
 - Local technician(s) and resource advisors

What variables and circumstances must be considered by the COML?

Unit 6:
Incident Communications Systems

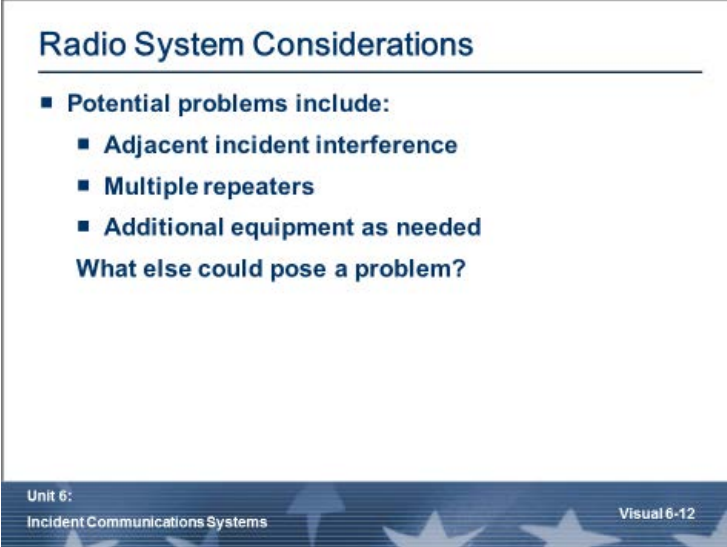
Visual 6-11

Key Points

When analyzing coverage, the Communications Unit Leader must consider:

- Terrain
- Incident size
- Available equipment
- Incident coverage
- Timing
- ICP/ICC locations
- Camp locations (remote)
- Roads
- Travel routes
- Accessibility
- Helibase location
- Aircraft
- Staging areas
- Incident size and expected growth
- Incident objectives
- Operational boundaries
- Assigned resource communication capabilities

Topic Radio System Considerations



Radio System Considerations

- **Potential problems include:**
 - **Adjacent incident interference**
 - **Multiple repeaters**
 - **Additional equipment as needed**

What else could pose a problem?

Unit 6:
Incident Communications Systems

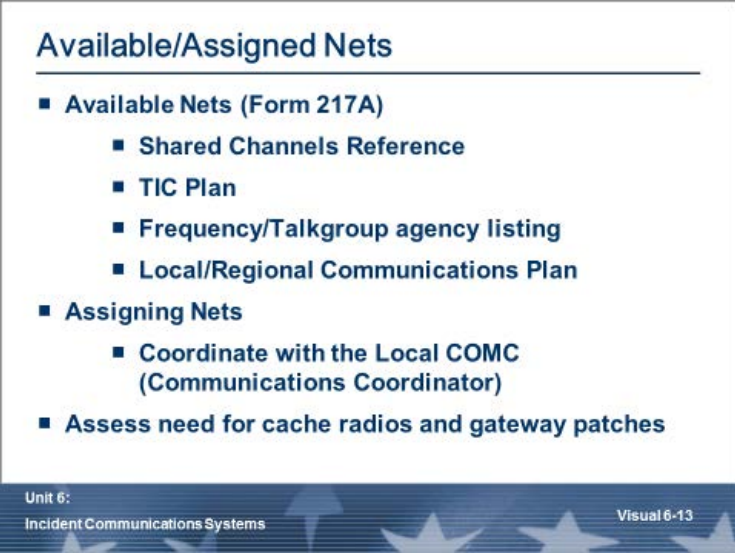
Visual 6-12

Key Points

On large and complex incidents, the Communications Unit Leader may be dealing with:

- Adjacent incident interference
 - Interference with normal daily response radio traffic (e.g., Northridge earthquake; Atlanta tornado; Ft. Worth tornado) can be a complication
- Additional equipment may be needed
 - More complexity means more need for equipment
 - Repeaters, links, additional cache radios, etc. are required as an incident's communications scale in complexity

Topic Available/Assigned Nets



Available/Assigned Nets

- Available Nets (Form 217A)
 - Shared Channels Reference
 - TIC Plan
 - Frequency/Talkgroup agency listing
 - Local/Regional Communications Plan
- Assigning Nets
 - Coordinate with the Local COMC (Communications Coordinator)
- Assess need for cache radios and gateway patches

Unit 6:
Incident Communications Systems

Visual 6-13

Key Points

Form 217A, TIC Plan, or local or regional Communications Plan.

Coordinate with the local Communications Coordinator, if designated.

TopicImplementing Communications Solutions

Implementing Communications Solutions

- Use a shared system?
- Use shared channels?
- Activate a radio cache?
- Order a gateway?
- Utilize a mobile communications unit?
- Set up repeaters and portable towers?
- Document the plan with the ICS Form 205

Unit 6:
Incident Communications Systems


Visual 6-14

Key Points

Topic Initial Order—Personnel

Initial Order – Personnel

- Order by assignment and Incident Command System (ICS) position
 - INCM: Incident Communications Center Manager
 - COMT: Incident Communications Technician
 - RADO: Radio Operator
 - THSP: Technical Specialist
- Qualifications?



Unit 6:
Incident Communications Systems

Visual 6-15

Key Points

Assess the personnel requirements according to the duration and complexity:

- RADO and COMT are almost always the first ordered; most incidents require them
- INCM is in the initial order if the Communications Unit Leader plans to create outposts or expects span-of-control issues
- Technical Specialists are usually any local individuals the Communications Unit needs, but will not fit under any other title

Topic Initial Order—Supplies

Initial Order – Supplies

- Determine supply needs according to:
 - Tactical resource orders
 - Projected number of incident facilities
 - Projected growth of incident
- When placing initial supply order, plan for approximately three days.
- Battery needs are a particular concern
 - May need to order 2 changes of batteries per radio, per operational period.

Unit 6: Incident Communications Systems Visual 6-16

Key Points

When placing an initial order, it's important to determine supply needs based on tactical resource orders, the projected number of incident facilities, and the projected growth of the incident. Each of these variables can influence the communications resources needed.

The initial supply order should aim to sustain communications operations for three days. If the radios used on the incident do not have multiple batteries, then you need to order a sufficient number of rechargeable batteries and chargers to handle the number of radios assigned to the incident and a means to power them. This includes power strips, sufficient outlets, and amperage to support the chargers.

If AA batteries are employed for clamshell use, warehouse stores (such as Wal-Mart or Costco) have supply chains sufficient for incident support.

Batteries:

Battery life predictions are typically based on about 5% transmit, 5% receive and 90% standby times. For more information on portable radio batteries, a good resource is www.batteryuniversity.com.

Topic Initial Order Procedure

Initial Order Procedure

- **General Message Form (ICS Form 213)**
 - Yellow and pink submitted to recipient
 - White retained by sender
 - Pink returned to sender when reply issued
- Distribute copies as appropriate
- Provide as much information as possible
 - Give specific delivery time, date and location. Do not use “ASAP”.
- Route through established ordering channels (often the LSC or SPUL)

Unit 6:
Incident Communications Systems

Visual 6-17

Key Points

Use the General Message Form (ICS 213) to order supplies, making sure to include quantities and descriptions as well as position codes. Orders should be routed through the established channels, generally the Logistics Section Chief or Supply Unit Leader.

When filling out the ICS 213, be specific and include details. Fill out all blocks on the form. Make delivery times practical (“ASAP” is not acceptable). Be specific when ordering quantities (packages versus pallets). Personnel requests should anticipate practical travel times.

- What do you want?
- When do you want it?
- Where do you want it?

TopicOrder and Manage Use of Temporary System Equipment

Order and Manage Use of Temporary System Equipment

- Determine required coverage area
- Locate equipment sites
- Provide for equipment security
- Avoid interference issues
- Apply local and regional SOPs
- Adhere to mutual aid agreements

Unit 6:
Incident Communications Systems

Visual 6-18

Key Points

Topic Swap/Cache Radios

Swap/Cache Radios

- Provide radio cache programming coordination and validation
- Accountability



Unit 6:
Incident Communications Systems

Visual 6-19

Key Points

Refer to T-Card in Forms section of the Student Workbook.

If necessary, provide for radio cache programming. Provide for accountability of issued equipment.

Accountability

1. KIND OF PROPERTY BK RADIO	2. CACHE/UNIT NAME K186	3. I.D. NO. 07
4. SIZE/CAPACITY		
1 - "AA" CLAMHELL		
1 - REMOTE SPEAK MIC		
1 - LEATHER CASE/HEAT		
ASSIGNMENT RECORD		
5. DATE/TIME 08-19-06	6. OPERATIONAL PERIOD 0600 TO 1800	
7. NAME JON DDE		
8. HOME BASE CITY OF CONCORD PD		
9. INCIDENT ASSIGNMENT STREET DIVISION		
10. RETURNED DATE/TIME	11. TRANSFERRED TO	
5. DATE/TIME	6. OPERATIONAL PERIOD	
7. NAME		
8. HOME BASE		

Unit 6:
Incident Communications Systems
Visual 6-20

Key Points

They may seem simple, but they don't take batteries and they don't break.

It is highly recommended to avoid using abbreviations on T-Cards if possible.

If it cannot be avoided, keep an abbreviations list available for review as personnel change from one operational period to another.

Topic Consider Commercial Services

Consider Commercial Services

- Radio Systems
- Telephones
- Satellite
- Contract Technicians



Unit 6:
Incident Communications Systems

Visual 6-21

Key Points

This is where your MOB Guide fills a role. Define your ordering point in your MOB Guide. Before the incident, know your authority to order and obligate fiscally.

Topic Solutions for Telephone and Data**Key Points**

Consider vulnerability of cell service for emergency operations. Remember cell is still coming out into the landline telephone network at some point.

Wireless carriers may be able to provide Cellular on Wheels (COWS), Cell on Light Trucks (COLT), and other cellular and wireless resources.

Before requesting resources from wireless carriers, be clear on what it is you are trying to accomplish. All carriers are not the same in terms of coverage, quality, and reliability in any given area. No one system will provide service to all users. Clearly identify and get approval for any associated costs in advance. These resources may take considerable time to deploy and they may have deployment costs attached. Be sure to have written approval before requesting these resources.

- Verizon Significant Events Center (800) 981-9558
- Sprint-NEXTEL Emergency Contact (888) 639-0020
- AT&T National Communications System-National Coordinating Center (703) 235-5080

Topic Technology Services

Technology Services

- Do you need data devices?
- Internet connectivity?
- Establish LAN and WAN?
- Can you provide VoIP?



Unit 6:
Incident Communications Systems

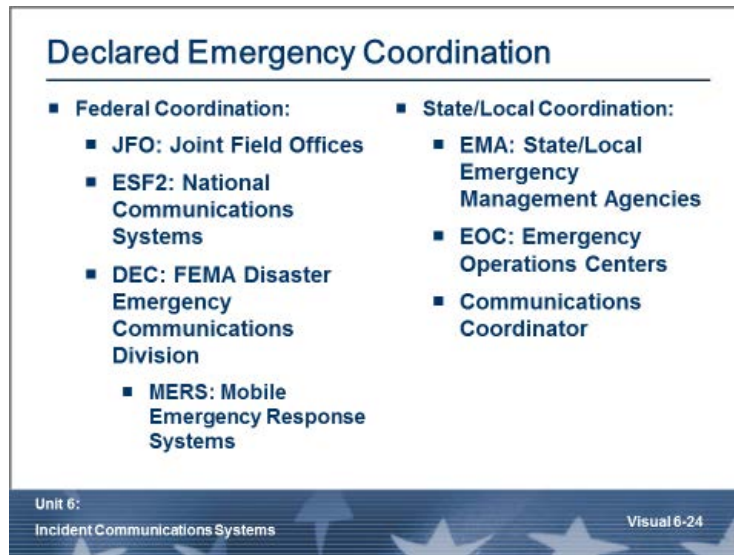
Visual 6-23

Key Points

Consider vulnerability of any system you order. Make sure it will all work together when ordering.

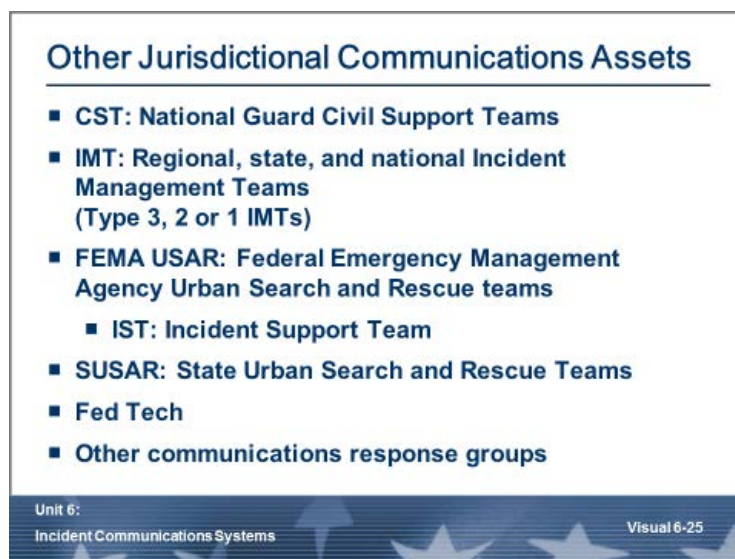
Is VoIP technology something that you want or need for your incident?

It is very important to keep your eyes open and stay current about what is available. Are tools resilient and still applicable to the current day?

Topic Declared Emergency Coordination**Key Points**

- Joint Field Offices (JFOs) generally are for the coordination of Federal responders
- Emergency Support Function 2 (ESF2): National Communications System (NCS)
- FEMA’s Disaster Emergency Communications (DEC) provides tactical disaster emergency communications capabilities to support all-hazards disaster response and national security response requirements
 - Mobile Emergency Response Systems (MERS): FEMA’s communications response that supports Federal, State, and local responders—not disaster victims
- Emergency Management Agencies (EMA) will typically coordinate local disaster response and will be the interface to State and Federal resources
- Emergency Operations Centers (EOC) are a component of the Multiple Agency Coordination System (MACS) within NIMS
 - They also perform multidiscipline coordination

Topic Other Jurisdictional Communications Assets

**Key Points**



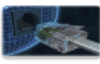
Other jurisdictional communications assets to coordinate with include:

- National Guard Civil Support Teams (CSTs)
 - Many now deploy with a well-equipped communication package; check with your local team on their capabilities
 - Department of Defense (DOD)
 - Tactical Emergency Response Teams (TERTs)
 - Regional, State, and national Incident Management Teams (Type 3, 2, or 1 IMTs)
 - Federal Emergency Management Agency Urban Search and Rescue Teams (FEMA USAR Teams)
 - The teams deploy with a robust communication capability and a Communication Specialist
 - State Urban Search and Rescue Teams
 - Fed Tech
 - Ad-hoc group of Federal and local technical assets that track interference
 - Other jurisdictional communication response groups
- Group discussion on working with other response groups

Topic Priority Telecommunications Services

Priority Telecommunications Services

Priority Telecommunications Services programs provide public safety and national security users the ability to communicate on telecommunications networks during times of congestion.

-  Government Emergency Telecommunications Service (GETS)
-  Wireless Priority Service (WPS)
-  Telecommunications Service Priority (TSP)

Unit 6:
Incident Communications Systems

Visual 6-26

Key Points

Priority Telecommunications Services enhance the existing commercial infrastructure with priority features for public safety or national security personnel to improve their chances of completing a call when wireline and cellular telephone usage is high resulting in calls not getting through.

GETS provides priority over wireline telephones; WPS does the same over cellular networks with all major carriers, and TSP gives priority treatment to circuit repairs and installations. Government Emergency Telecommunications Services (GETS):

- Enables users to have end-to-end priority on their land-lines
- Historically offers well over a 90 percent call completion during congestion

Wireless Priority Service (WPS):




- Enhances call completion on the wireless network
- Historically offers up to a 90 percent call completion during congestion

Telecommunications Service Priority (TSP):

Authorizes organizations to receive priority for the repair and installation (also referred to as restoration and provisioning) of critical voice and data circuits that support National Security and Emergency Preparedness (NS/EP) communications.

Topic Priority Telecommunications Services (cont'd)

Priority Telecommunications Services (cont'd)

- **Government Emergency Telecommunications Service (GETS)**
 - Priority access to the public wireline network
 - GETS is supported by all major service providers 
- **Wireless Priority Service (WPS)**
 - Priority access to the public wireless network
 - WPS is available through AT&T, Edge Wireless, Southern LINC, Sprint/Nextel, T-Mobile, Verizon 
- **Telecommunications Service Priority (TSP)**
 - Establishes priority for restoration/provisioning of NS/EP circuits
 - Supported by an FCC regulatory mandate 

Unit 6:
Incident Communications Systems

Visual 6-27

Key Points


Often times, it is necessary to either prioritize the provisioning of new communications services or prioritize the restoration of services that have been damaged or otherwise are not functioning. This is especially true in disaster situations when numerous outages may occur at once or systems become overloaded by demand. This topic introduces three major priority service programs that have been established by the Federal government in order to provide prioritized system access for designated users or to allow for prioritized installation/restoration of services.

The Federal government administers these priority communications services that are provided by the wireline and wireless telecommunications carriers and are necessary to promote the nation's security and emergency preparedness (NS/EP) functions.

Topic Government Emergency Telecommunications Service (GETS)

Government Emergency Telecommunications Service (GETS)

- GETS is a no cost calling card that provides priority for outbound calls to all regular telephone numbers
- GETS uses the capacity of the public network, it is not a separate system
- Caveats:
 - GETS will not work without a dial tone
 - May experience soundless delays while queuing
 - GETS does not mitigate cellular congestion
 - GETS cannot be used for toll free numbers



Unit 6:
Incident Communications Systems

Visual 6-28

Key Points**Government Emergency Telecommunications Service (GETS)**

Because access to the public communications network is degraded in times of crisis, the National Communications System programs ensure priority access for critical users.

- Priority access to the public wireline network
 - GETS uses the capacity of the public network, it is not a separate system
- GETS is supported by all major service providers
- GETS is a no-cost calling card that provides priority for outbound calls to all regular telephone numbers
 - All COMM Unit staff should have GETS Cards

Important to Know

- GETS will not work without dial tone
- May experience soundless delays while queuing
- GETS does not mitigate cellular congestion
- GETS cannot be used for toll-free numbers
- Need to test the GETS occasionally
- Identify Point of Contact for GETS
- Useful over satellite phones
- For MOB Guide, find out who in your agency has GETS and WPS cards

GETS operations and administration support:

Website <http://gets.ncs.gov/>

E-Mail: gets@dhs.gov
To apply for or to manage your GETS account:
gwids@saic.com

Telephone: **1-866-NCS-CALL** (1-866-627-2255)

GETS: Government Emergency Telecommunications Service
(<http://www.dhs.gov/government-emergency-telecommunications-service-gets>)

Topic GETS (cont'd)



Key Points

- GETS calls will wait or queue for a resource to be available to set up the call.
- GETS calls will try another long distance carrier if one is busy.
- GETS calls not subjected to carriers' call restrictions like the general public when the network is congested.
- GETS calls will have priority routing to a dialed cell phone if on a WPS carrier *Note: no priority from a cell phone until the call reaches the Public Switched Telephone Network (PSTN).
- Although there are no priority features on the satellite segment of a satellite phone call, GETS will work when the call transitions to the PSTN.


Typical problems with GETS

- Calls from a hotel, office PBX, or pay phone may not have programmed 710 as an available area code – solution – use the back of the card for alternate GETS access numbers.
- Silence on the line – solution – do not hang up, call is queuing for resources.
- Will not connect to a toll-free number – Future version of AT&T and Verizon GETS will have toll free dialing, but until then, you must find the "assigned" number to common toll free numbers.
- Misdialing the 12 digit PIN – solution – program it as a speed dial on desk and cellular phone.
- No dial tone – no solution – GETS needs dial tone to work.

Topic Wireless Priority Service (WPS)

Wireless Priority Service (WPS)

- WPS provides priority for emergency calls made from cell phones including PDAs
- WPS feature is added on a per-phone basis for Alltel, AT&T, Cellular South, Edge Wireless, SouthernLINC, Sprint Nextel, Sprint PCS, T-Mobile, and Verizon Wireless
- Caveats:
 - WPS will not work without a signal
 - Users may experience waits up to 28 seconds
 - WPS may not work when roaming
 - 9-1-1 loses geo locator



272 +
Destination
number

Unit 6:
Incident Communications Systems
Visual 6-30

Key Points

- Priority access to the public wireless network. WPS provides priority for emergency calls made from cell phones, including PDAs
- WPS feature is added on a per-phone basis for Alltel, AT&T, Cellular South, Edge Wireless, SouthernLINC, Sprint Nextel, Sprint PCS, T-Mobile, and Verizon Wireless
- Be sure WPS is assigned to fixed cellular units (Telular)
- WPS is an essential tool for Communications Unit personnel

Important to Know

- WPS will not work without a signal
- Users may experience waits up to 28 seconds
- WPS may not work when roaming
- 9-1-1 loses geographic locator
- WPS typically has a monthly fee per phone not to exceed \$4.50 and is not available in all carriers
- Utilizes the same point of contact that GETS does

<https://www.dhs.gov/wireless-priority-service-wps>

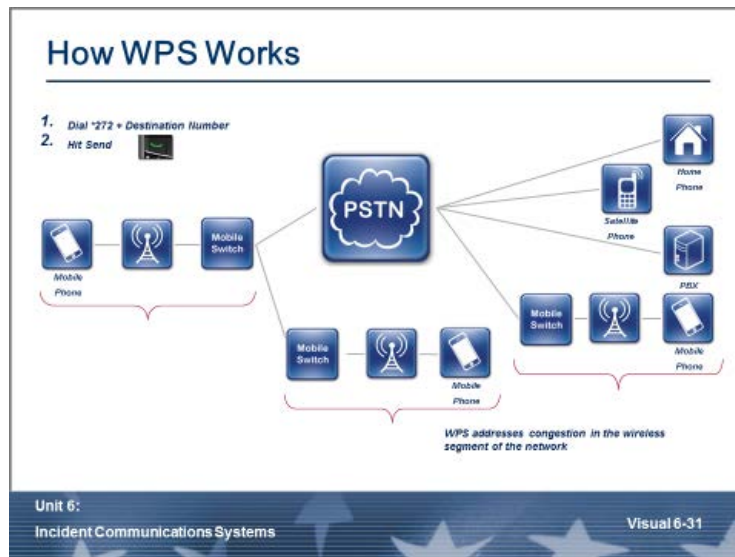
WPS operations and administration support:

Website www.wps.ncs.gov

E-Mail: wps@dhs.gov

Telephone: **1-866-NCS-CALL** (1-866-627-2255)
 1-703-676-CALL (2255)

Topic WPS (cont'd)

**Key Points**

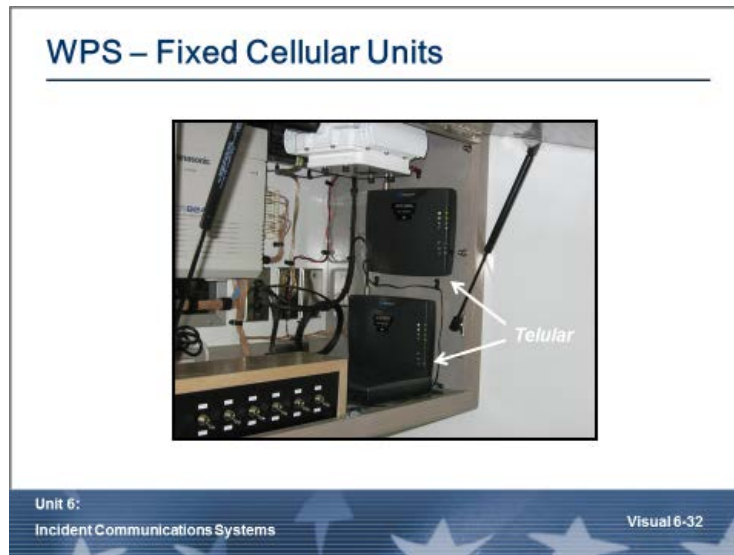
Discuss how WPS Works.

Key features:

- WPS calls will queue for the next available radio channel
- CDMA WPS calls will receive priority on the signaling channel that sets up the call
- WPS calls do receive most GETS features when the call traverses the Public Switch Telephone Network; however use of WPS + GETS together will ensure all features are available

Typical problems with WPS:

- When upgrading/purchasing a phone and the WPS feature doesn't transfer – solution – check for WPS immediately to ensure feature transferred. If WPS has not transferred, call your wireless provider
- User hits the SEND key after *272 but before entering the destination number. (Should enter *272 + Destination Number + SEND).
- Silence on the line – solution – do not hang up for 30 seconds, call is queuing for resources.
- Can't use *272 with contact list – solution – pre-program a second entry number for official calls that previews the call with *272.
- No signal – no solution – WPS needs a signal to work.
- Cannot dial 911 – WPS will not forward geo data to PSAP.

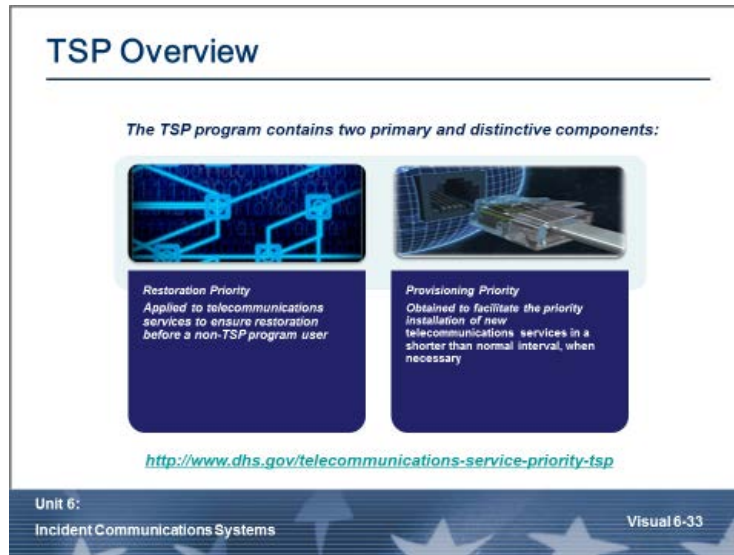
Topic WPS – Fixed Cellular Units**Key Points**

This image shows cellular fixed wireless devices in a mobile communications vehicle. Verizon and AT&T units are shown.

Fixed device emulates POTS line on cellular network.

Often found in Emergency Operations Centers (EOCs), Communications Centers, and Command Vehicles.

Should have Wireless Priority Service (WPS) on line(s).

Topic Telecommunications Service Priority (TSP)**Key Points**

The TSP program consists of two components: Restoration and Provisioning.

Supported by an FCC regulatory mandate, TSP establishes priority for restoration/provisioning of NS/EP circuits. TSP restoration priorities are applied to new or existing telecommunication services to ensure they are restored by telecommunications vendors before a non-TSP program user.

Note that TSP restoration assignments must be requested and assigned before a service outage occurs. In other words, a user cannot request restoration assignments for critical circuits after a natural or technical disaster strikes.

TSP Provisioning priorities facilitate the priority installation of new telecommunication services by vendors in a shorter than normal time interval. However, this service cannot be used to compensate for inadequate planning on the part of the user.

With the exception of EMERGENCY provisioning orders, restoration orders are processed before new service provisioning orders. In all cases the service order is expedited according to the service vendor's "Best Effort."

TSP operations and administration support:

Please contact the TSP Program Office staff with questions regarding the TSP Program between 8 a.m. and 6 p.m. (EST), Monday through Friday.

For Restoration Requests:

NCS Help Desk, between 8 a.m. and 6 p.m.
Eastern time, Monday thru Friday:
866-NCS-CALL (866-627-2255) or 703-676-
2255

TSP Program Office Staff, between 8 a.m. and
4:30 p.m. Eastern time, Monday thru Friday:
703-235-5359

**For Emergency and Essential
Provisioning Requests:**

TSP Program Office Staff, between 8 a.m. and
4:30 p.m. Eastern time, Monday thru Friday:
703-235-5359

After normal working hours:
703-235-5080 (ask for the TSP Duty
Coordinator)

Fax

703-235-5806. For secure fax number, call
703-235-5080

Email

tsp@dhs.gov

Topic Candidate Organizations

Candidate Organizations	
Cities/Counties/States/Districts	Hospitals/Medical Services
Office of Emergency Management	Public Health
Police/Sheriff/Fire	Transit Agencies
Water, Gas, Power	Ports/Airports
Telecom	Search and Rescue
Public Works	School and College Districts
Irrigation Districts/Flood Control	Volunteer Agencies
Agencies included in Emergency Management Plans	Critical Infrastructure Suppliers
Financial Institutions	National Guard

Unit 6:
Incident Communications Systems

Visual 6-34

Key Points

TopicCandidate Locations/Functions

Candidate Locations/Functions

Operations Centers	Police/Fire/EMS Dispatch
Back-up EOC	City/County Yards
Command Vehicles	Remote Offices
PSAPs (911 Center)	Power/Pump Stations
Computer/IT Center	Shelters

Unit 6:
Incident Communications Systems

Visual 6-35

Key Points

TopicAdditional Information

Additional Information

For more information visit:
<http://www.dhs.gov/gets>
<http://www.dhs.gov/wps>
<http://www.dhs.gov/tsp>

For assistance setting up accounts:
DHS Priority Telecommunications Service Center
1-866-627-2255
Monday - Friday, 8 AM to 6 PM Eastern Time
Follow voice prompts for each service


Unit 6:
Incident Communications Systems

Visual 6-36

Key Points

Other Resources

Radio propagation software
<http://www.cplus.org/rmw/english1.html>



Unit 6:
Incident Communications Systems

Visual 6-37

Key Points

Propagation software may provide an approximation of coverage, but shouldn't be used for hard planning data.

Systems should be physically tested and not deployed solely on the basis of propagation software.

Other Resources (cont'd)

- **Radio Propagation Example**

Unit 6:
Incident Communications Systems

Visual 6-38

Key Points

Topic Other Resources (cont'd)

Other Resources (cont'd)


- Here are examples of ways to create a mini logging recorder using a Scanner and PC:
 - <http://www.butelsoftware.com>
 - <http://www.proscan.org>
- A number of other scanner software vendors can provide this service
- To get almost every frequency, PL and Talkgroup:
 - <http://www.RadioReference.com>

Unit 6:
Incident Communications Systems

Visual 6-39

Key Points

Topic Other Resources (cont'd)



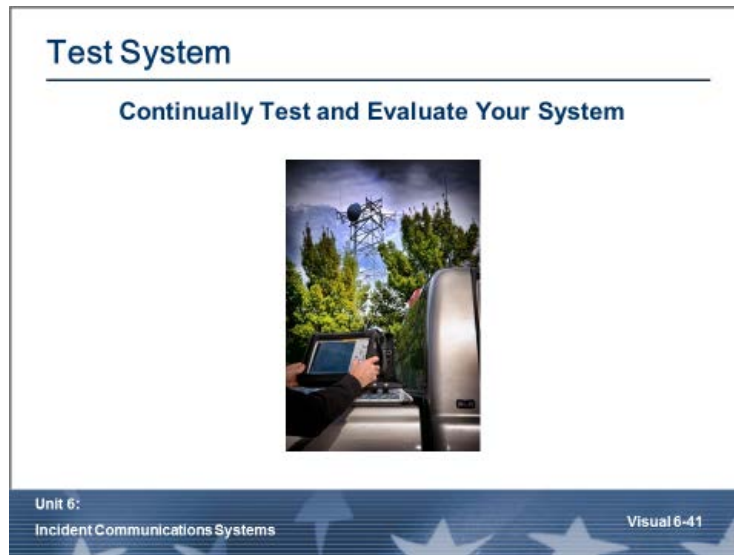
Other Resources (cont'd)

- Yahoo group specifically for communications personnel:
 - OEC-COML
 - <https://groups.yahoo.com/neo/groups/OEC-COML/info>

Unit 6:
Incident Communications Systems

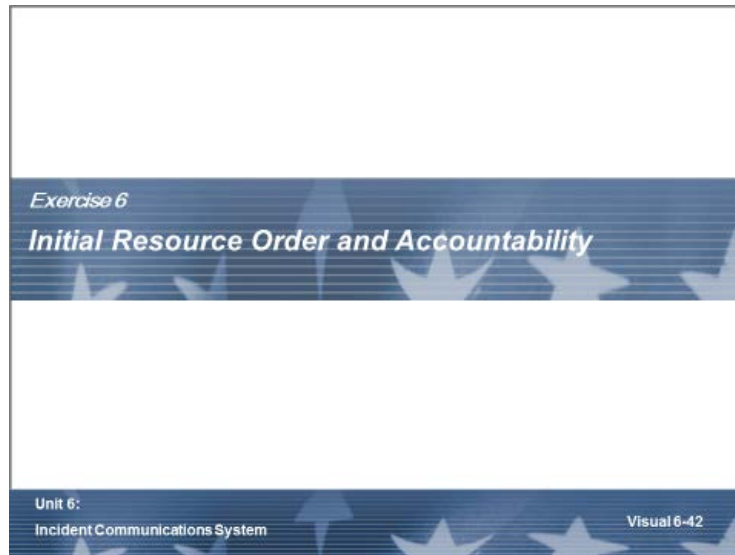
Visual 6-40

Key Points

**Key Points**

With complex systems, constant monitoring is required to ensure the system has not been degraded and to make improvements. Query your performance with actual users in the field.

TopicExercise 6: Initial Resource Order and Accountability

**Key Points**

The purpose of the exercise is to provide the participants with an opportunity to order supplies, personnel, and equipment on the ICS Form 213 – General Message. This exercise will also provide the students with an opportunity to identify the pros and cons of specific tracking systems for accountability purposes during an incident. This exercise is scheduled to last approximately 45 minutes, including small group discussions and presentation of group findings.

Topic Objectives Review

Objectives Review

1. *Describe the COML's responsibilities in establishing an incident radio communications system.*
2. *Describe use of command and tactical nets.*
3. *What are the requirements for establishing an incident radio communications system?*
4. *Describe specific communication information gathered.*
5. *Describe considerations for evaluating needs and ordering supplies, materials, and personnel to keep unit operating.*

Unit 6:
Incident Communications Systems

Visual 6-43

Key Points

Unit Terminal Objectives

At the conclusion of the unit, the student will describe the Communications Unit Leader responsibilities in establishing an incident radio communications system. The student will also be able to describe the actions and considerations necessary to mobilize for an incident and gain situational awareness.

Unit Enabling Objectives

- Describe the COML's responsibilities in establishing an incident radio communications system
- Identify Communications Unit Leader incident information sources
- Describe use of command and tactical nets
- Identify requirements for establishing an incident radio communications system
- Identify and describe necessary actions to ensure readiness for assignment
- Describe the information gathered from the initial meetings, briefings, and documents
- Describe specific communication information gathered
- Evaluate needs and order supplies, materials, and personnel to keep unit operating

Topic

Questions?



Key Points

Unit 7: Develop and Disseminate the Incident Radio Communications Plan (ICS Form 205)

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Create and publish a properly constructed Incident Radio Communications Plan (ICS Form 205) and a Communications Resource Availability (Form 217A)
- Explain the purpose of Incident Radio Communications Plan (ICS Form 205)
- Identify critical information to be included in an ICS Form Radio Communications Plan by completing the Communications Resource Availability (Form 217A)
- Identify security requirements for Communications Resource Availability (Form 217A) and Incident Radio Communications Plan (ICS Form 205)
- Describe the proper dissemination of the Incident Radio Communications Plan (ICS Form 205)

Methodology

This unit involves lecture, discussion based activities, and exercises.

Knowledge of unit content will be evaluated through administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of Exercise 7.

The purpose of Exercise 7 is to complete an Incident Radio Communications Plan (ICS Form 205) to provide a command and tactical channels for all resources. This exercise is scheduled to last approximately 45 minutes. The instructor will use a build slide to demonstrate how to complete a blank Incident Radio Communications Plan (ICS Form 205). Based on this information, the students will discuss the significance of the information received and what conclusions to draw as they create a 205.

The purpose of this unit is to provide the student with an understanding of the Communication Unit Leader's responsibility for the development, completion and publication of the Incident Radio Communications Plan (ICS Form 205) and how using the Communications Resource Availability (Form 217A) as a tool assists in creating the Incident Radio Communications Plan (ICS Form 205).

Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	1 hour
Exercise 7	45 minutes
Total Time	1 hours, 45 minutes

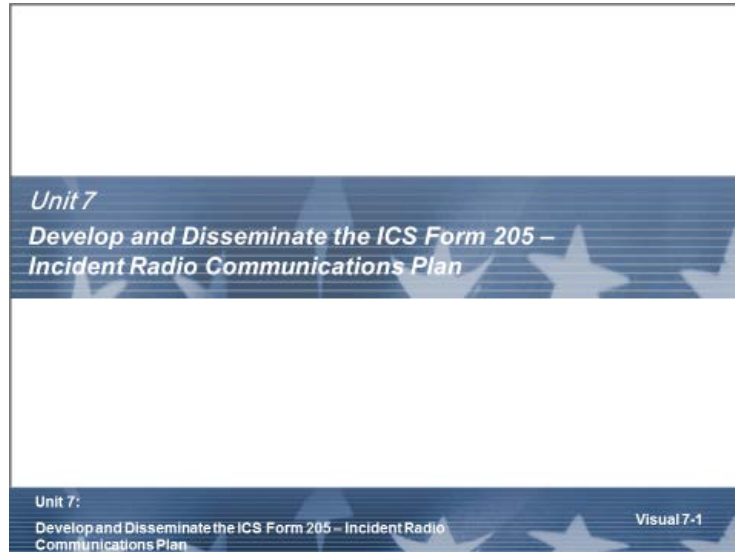
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Unit 7

Develop and Disseminate the Incident Radio Communications Plan (ICS Form 205)

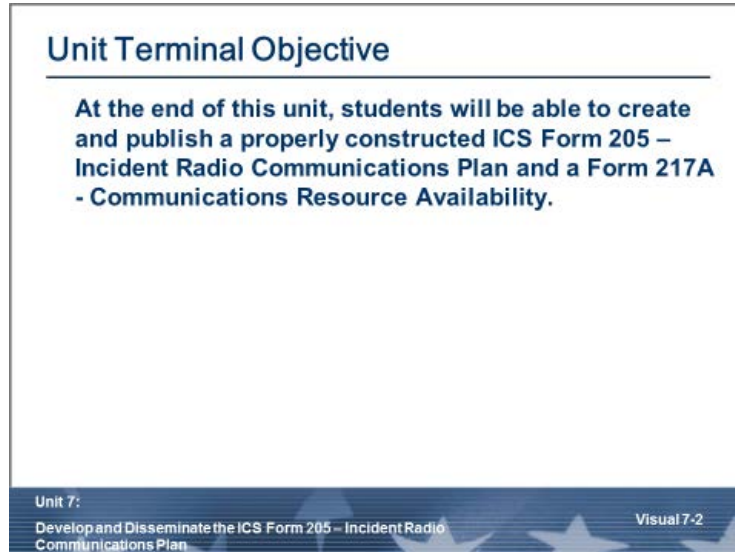
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective



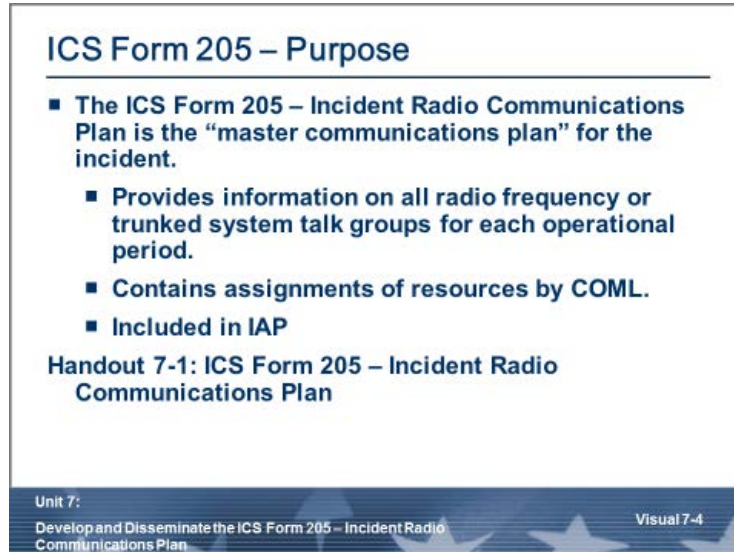
Key Points

Unit Terminal Objective

At the end of this unit, students will be able to create and publish a properly constructed Incident Radio Communications Plan (ICS Form 205) and a Communications Resource Availability (Form 217A).

Unit Enabling Objectives

- Explain the purpose of Incident Radio Communications Plan (ICS Form 205)
- Identify critical information to be included in an Incident Radio Communications Plan (ICS Form 205) by completing Communications Resource Availability (Form 217A)
- Identify security requirements for ICS Forms 217A and 205
- Describe the proper dissemination of the Incident Radio Communications Plan (ICS Form 205)



Key Points


The Incident Radio Communications Plan is a summary of information pulled from the ICS Form 216 - Radio Requirements Worksheet) and the ICS Form 217 - Radio Frequency Assignment Worksheet Communications Resource Availability (Form 217A).

The Incident Radio Communications Plan (ICS Form 205) is a part of the IAP, is completed by the Communications Unit Leader, and is primarily meant for incident operations.

Topic Incident Radio Communications Plan (ICS Form 205)—General Guidelines

ICS Form 205 – General Guidelines

- Incident Radio Communications plan includes:
 - Command Radio Network
 - Tactical (division) net requirements
 - Support net requirements
- Not all networks appear on the “official” ICS Form 205 Radio Communications Plan



Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-5

Key Points

Command radio networks that are unclassified should be included on the form.

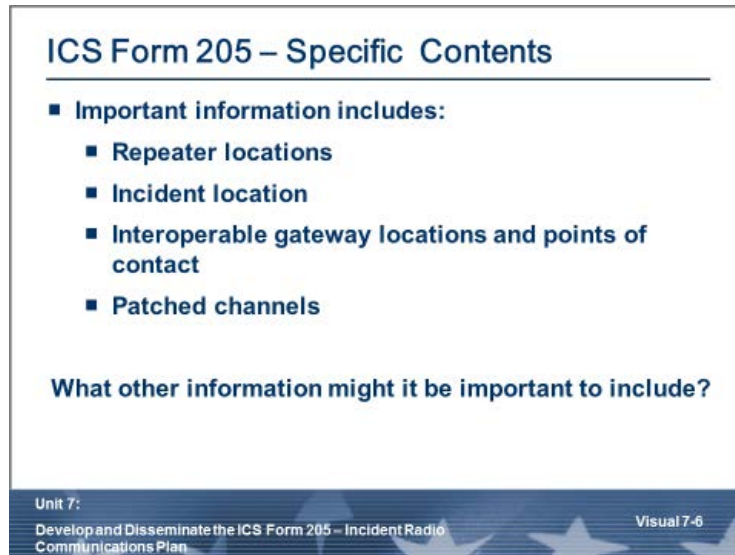
Secure or secret networks such as those used by the National Guard should not be included on the official Incident Radio Communications Plan (ICS Form 205) included in the IAP.

The Communications Unit Leader should have a personal, unpublished copy that is comprehensive.

Some Communications Unit Leaders place the tactical nets first on the Incident Radio Communications Plan (ICS Form 205), rather than the command net, so that operations section personnel have easy access to the channels that they use most often.

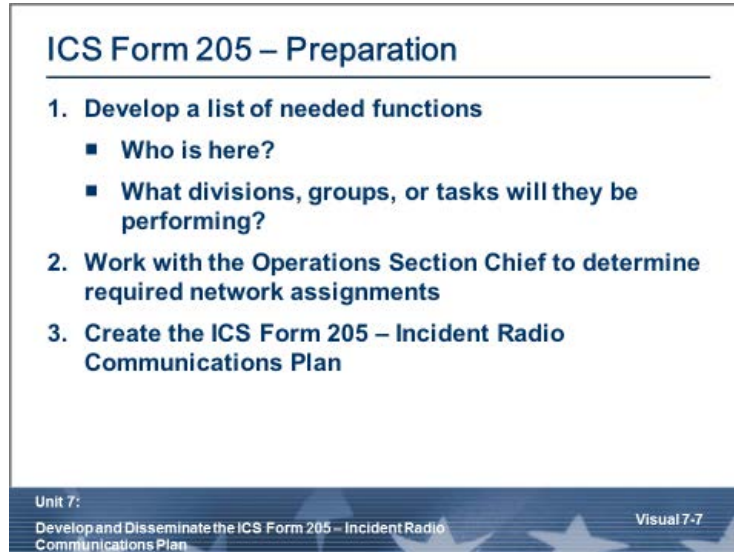
There may a requirement for more networks than you have channels available. The Communications Unit Leader should meet with Operations Section to determine which frequencies might be shared.

Topic Incident Radio Communications Plan (ICS Form 205)—Specific Contents



Key Points

- Repeater locations
- Incident location
- Patched channels
- Command Repeater net operations
- Air operations—AM and FM
- Air-to-ground
- Air Guard
- Local permanent repeater nets
- Wideband/narrowband/analog/digital issues
- Use of tones/Network Access Codes (NAC)
- Other pertinent information
- National Interagency Fire Center (NIFC) Standard
- NIFC Cache radios generally have 14 or 16 channels in a group
- One group is set aside as the incident group and will be programmed to meet the incident needs with command and tactical nets



Key Points

When developing an ICS Form 205 Radio Communications Plan, it's important to gather and organize the relevant information before completing the form:

- Develop a list of functions and what agencies are at the incident
 - List assets (radio types and bands) they came with
- Work with the Operations Section Chief to determine required network assignments
- Create the ICS Form 205 Radio Communications Plan

ICS Form 205 – Distribution

- Ensure a copy of the ICS Form 205 – Incident Radio Communications Plan is delivered to the appropriate Communications Point of Contact and any other regionally required personnel
- If field programming or cloning is occurring at the incident, validate the accuracy of the programming

How often should the ICS Form 205 – Incident Radio Communications Plan be re-evaluated?

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-8

Key Points

Information from the Radio Communications Plan is placed on Assignment Lists (ICS Form 204).

The ICS Form 205 Radio Communications Plan is delivered to the PSC and delivered to the appropriate Communications POC.

This way the incident does not inadvertently use a frequency/talkgroup that will interfere with other operations.

Form 217A Communications Resource Availability

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET Form 217A				Frequency Band 800 MHz		Description Interoperable Tactical Channels				
Channel Configuration	Channel Name / Trunked Radio System Talk Group	Eligible Users	Mobile RX Freq	N / W	RX Tone / NAC	Mobile TX Freq	N / W	TX Tone / NAC	Mode A, B, or M	Notes
Duplex	SCALL00	Any Public Safety	851.0125	W	156.7	806.0125	W	156.7	A	
Simplex	SCALL00D	Any Public Safety	851.0125	W	156.7	851.0125	W	156.7	A	
Duplex	BTAC91	Any Public Safety	851.0125	W	156.7	806.0125	W	156.7	A	
Simplex	BTAC91D	Any Public Safety	851.0125	W	156.7	851.0125	W	156.7	A	
Duplex	BTAC92	Any Public Safety	852.0125	W	156.7	807.0125	W	156.7	A	
Simplex	BTAC92D	Any Public Safety	852.0125	W	156.7	852.0125	W	156.7	A	
Duplex	BTAC93	Any Public Safety	852.0125	W	156.7	807.0125	W	156.7	A	
Simplex	BTAC93D	Any Public Safety	852.0125	W	156.7	852.0125	W	156.7	A	
Duplex	BTAC94	Any Public Safety	853.0125	W	156.7	808.0125	W	156.7	A	
Simplex	BTAC94D	Any Public Safety	853.0125	W	156.7	853.0125	W	156.7	A	

Handout 7-2: ICS Form 217 Radio Frequency Assignment Worksheet
Handout 7-3: Form 217A Communications Resource Availability

Unit 7:
 Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-9

Key Points

Form 217A Communications Resource Availability

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET Form 217A				Frequency Band UHF		Description Interoperable Tactical Channels				
Channel Configuration	Channel Name / Trunked Radio System Talk Group	Eligible Users	Mobile RX Freq	N / W	RX Tone / NAC	Mobile TX Freq	N / W	TX Tone / NAC	Mode A, D, or M	Notes
Duplex	UCALL40	Any Public Safety	453.2125	N	156.7	458.2125	N	156.7	A	
Simplex	UCALL400	Any Public Safety	453.2125	N	156.7	453.2125	N	156.7	A	
Duplex	UTAC41	Any Public Safety	453.4625	N	156.7	458.4625	N	156.7	A	
Simplex	UTAC410	Any Public Safety	453.4625	N	156.7	453.4625	N	156.7	A	
Duplex	UTAC42	Any Public Safety	453.7125	N	156.7	458.7125	N	156.7	A	
Simplex	UTAC420	Any Public Safety	453.7125	N	156.7	453.7125	N	156.7	A	
Duplex	UTAC43	Any Public Safety	453.8625	N	156.7	458.8625	N	156.7	A	
Simplex	UTAC430	Any Public Safety	453.8625	N	156.7	453.8625	N	156.7	A	

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-10

Key Points

Unit 7

Develop and Disseminate the Incident Radio Communications Plan (ICS Form 205)

Topic Communications Resource Availability (Form 217A) (cont'd)

Form 217A Communications Resource Availability

COMMUNICATIONS RESOURCE AVAILABILITY WORKSHEET Form 217A				Frequency Band VHF HIGH BAND				Description Interoperable Tactical Channels			
Channel Configuration	Channel Name / Trunked Radio System Talk Group	Eligible Users	Mobile RX Freq	N / W	RX Tone / NAC	Mobile TX Freq	N / W	TX Tone / NAC	Mode A, D, or M	Notes	
Simplex	VCALL10	Any Public Safety	155.7525	N	156.7	155.7525	N	156.7	A	Calling/Hailing	
Simplex	VTAC11	Any Public Safety	151.1375	N	156.7	151.1375	N	156.7	A	Tactical Simplex	
Simplex	VTAC12	Any Public Safety	154.4525	N	156.7	154.4525	N	156.7	A	Tactical Simplex	
Simplex	VTAC13	Any Public Safety	156.7375	N	156.7	156.7375	N	156.7	A	Tactical Simplex	
Simplex	VTAC14	Any Public Safety	159.4725	N	156.7	159.4725	N	156.7	A	Tactical Simplex	
Duplex	VTAC33	Any Public Safety	159.4725	N	136.5	151.1375	N	136.5	A	Tactical Repeater	
Duplex	VTAC34	Any Public Safety	156.7375	N	136.5	154.4525	N	136.5	A	Tactical Repeater	
Duplex	VTAC35	Any Public Safety	159.4725	N	136.5	156.7375	N	136.5	A	Tactical Repeater	
Duplex	VTAC36	Any Public Safety	151.1375	N	136.5	159.4725	N	136.5	A	Tactical Repeater	
Duplex	VTAC37	Any Public Safety	154.4525	N	136.5	156.7375	N	136.5	A	Tactical Repeater	
Duplex	VTAC38	Any Public Safety	156.7375	N	136.5	159.4725	N	136.5	A	Tactical Repeater	

VTAC33-38 Recommended for deployable tactical repeater user only (FCC Station Class FB2T).
VTAC36-38 are preferred. VTAC33-35 should be used only when necessary due to interference.

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-11

Key Points

Topic Communications Resource Availability (Form 217A) (cont'd)

Form 217A Communications Resource Availability

■ **“Copy” an available resource from the pre-filled Form 217A**

Channel Configuration	Channel Name / Trunked Radio System Talk Group	Eligible Users	Mobile RX Freq	N / W	RX Tone / NAC	Mobile TX Freq	N / W	TX Tone / NAC	Mode A, D, or IE	Notes
Duplex	8CALL90	Any Public Safety	851.0125	W	156.7	806.0125	W	156.7	A	

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-12

Key Points

The Communications Resource Availability Worksheet is prepared by a Communications Coordinator or Communications Unit Leader in an administrative setting prior to an incident. During an incident, a Communications Unit Leader may use the tools of popular word processing or spreadsheet software, to “copy” a line from a completed Communications Resource Availability (Form 217A) and “paste” the line directly to an Incident Radio Communications Plan (ICS Form 205). This minimizes the technical information regarding a channel or talkgroup from being copied incorrectly when completed by hand. In addition, the Communications Resource Availability (Form 217A) provides a standardized template for the presentation of channels or talkgroups that might be considered for use by appropriate personnel during an incident.

Topic Communications Resource Availability (Form 217A) (cont'd)

Form 217A Communications Resource Availability

- **“Copy” an available resource from the pre-filled Form 217A**

Channel Configuration	Channel Name / Trunked Radio System Talk Group	Eligible Users	Mobile RX Freq	N / W	RX Tone / NAC	Mobile TX Freq	N / W	TX Tone / NAC	Mode A, D, or M	Notes
Duplex	8CALL90	Any Public Safety	951.0125	W	158.7	908.0125	W	158.7	A	

- **“Paste” the resource to be used from the ICS 217A to the line on the ICS 205 which designates how the channel or talk group will be used during the incident**

Channel Configuration	Channel Name / Trunked Radio System Talk Group	Eligible Users	Mobile RX Freq	N / W	RX Tone / NAC	Mobile TX Freq	N / W	TX Tone / NAC	Mode A, D, or M	Notes
Command	8CALL90	Command	951.0125	W	158.7	908.0125	W	158.7	A	

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-13

Key Points

When building your Form 217A, ensure that the format matches your ICS Form 205.

TopicIncident Radio Communications Plan (ICS Form 205)

ICS Form 205 (cont'd)

- When completing the ICS Form 205 Radio Communications Plan, remember your audience!
- Clarity and accuracy are essential!

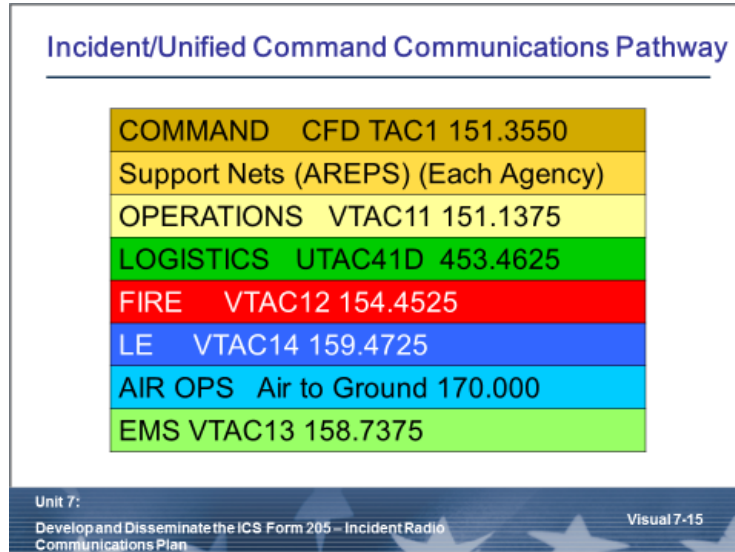
Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-14

Key Points

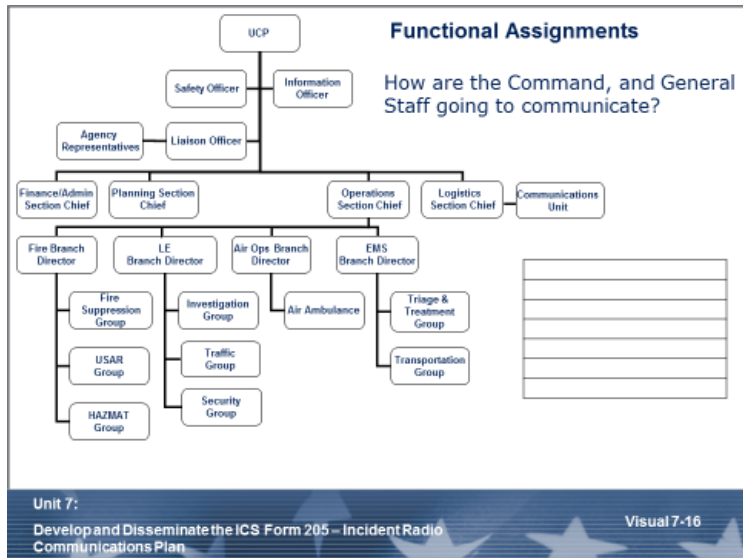
Topic

Incident/Unified Command Communications Pathway



Key Points

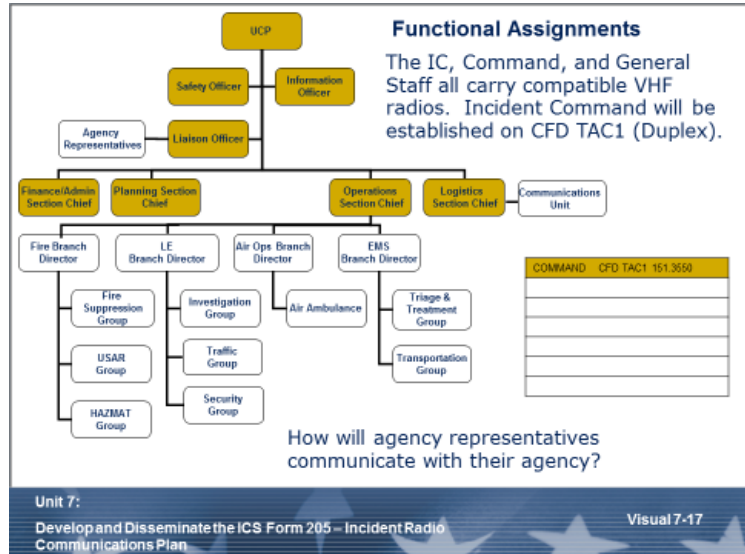
Topic Functional Assignments



Key Points

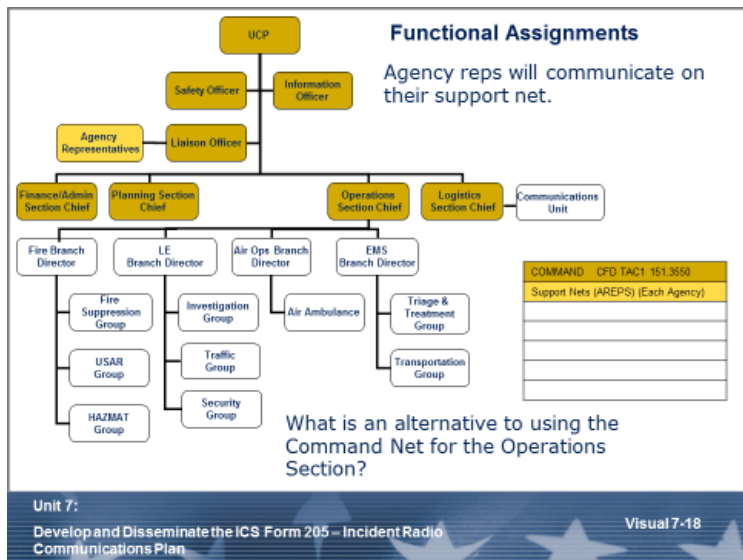
This is an example of how it can be built.

Topic Functional Assignments (cont.)



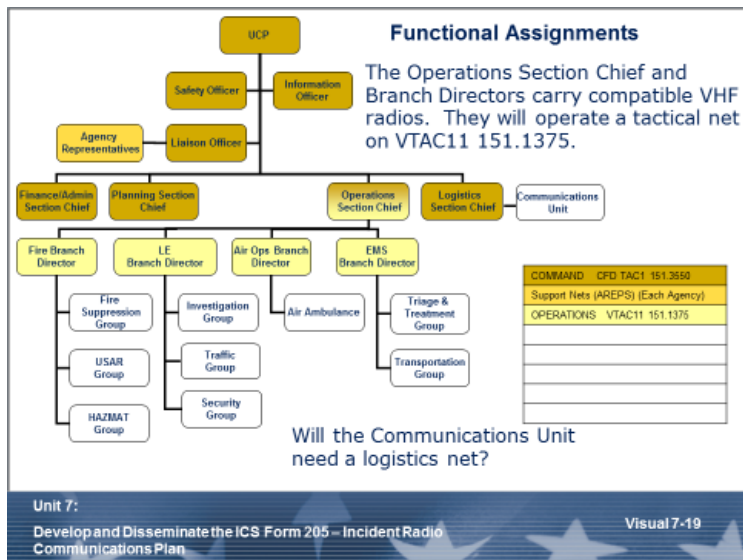
Key Points

Topic Functional Assignments (cont'd)



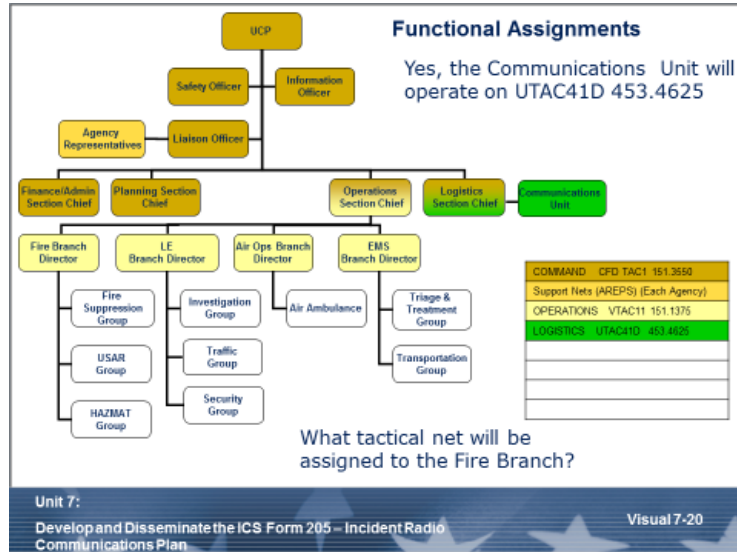
Key Points

Topic Functional Assignments (cont'd)



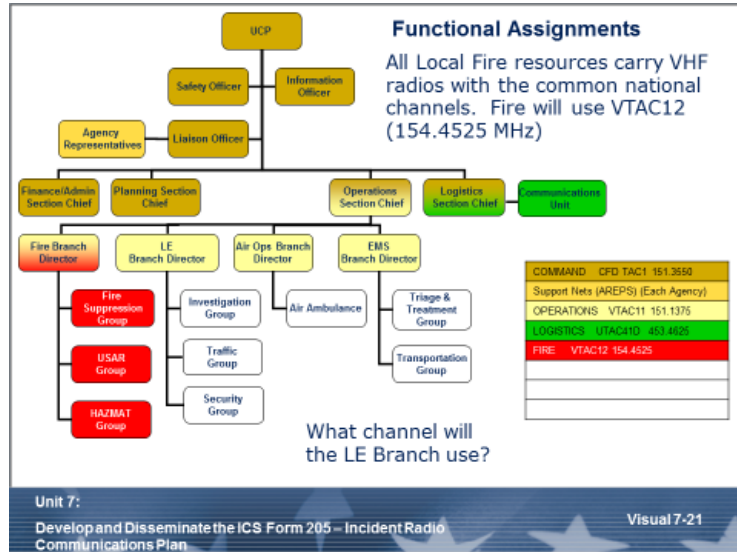
Key Points

Topic Functional Assignments (cont'd)



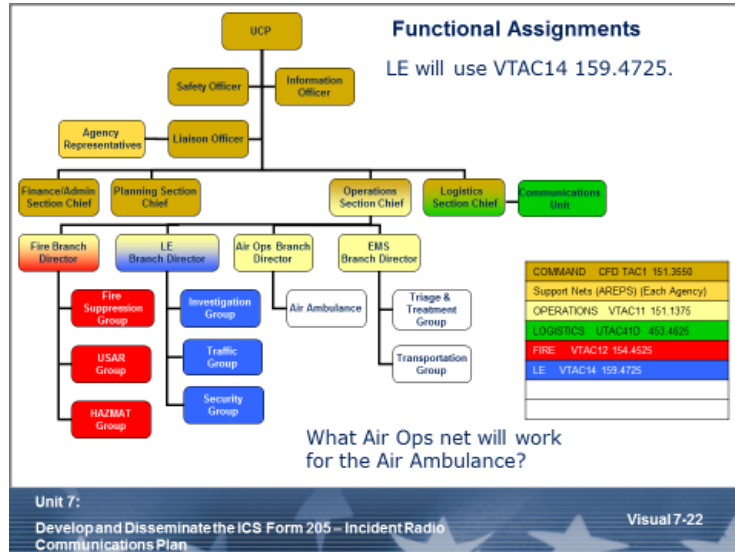
Key Points

Topic Functional Assignments (cont'd)



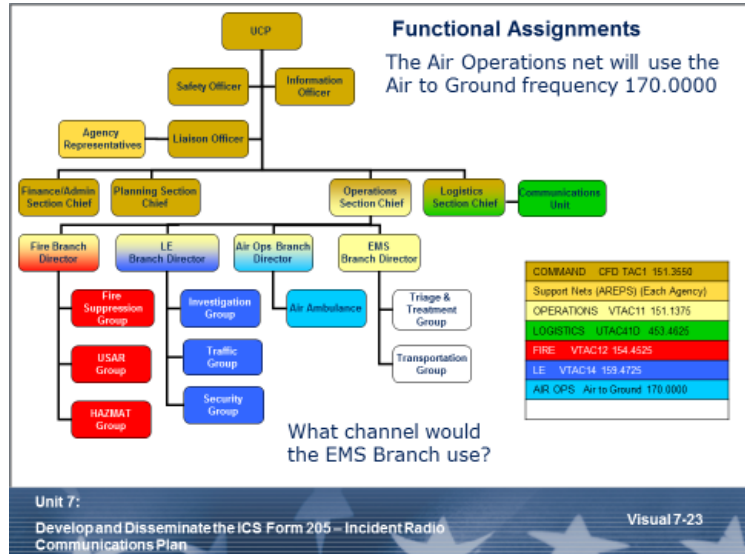
Key Points

Topic Functional Assignments (cont'd)



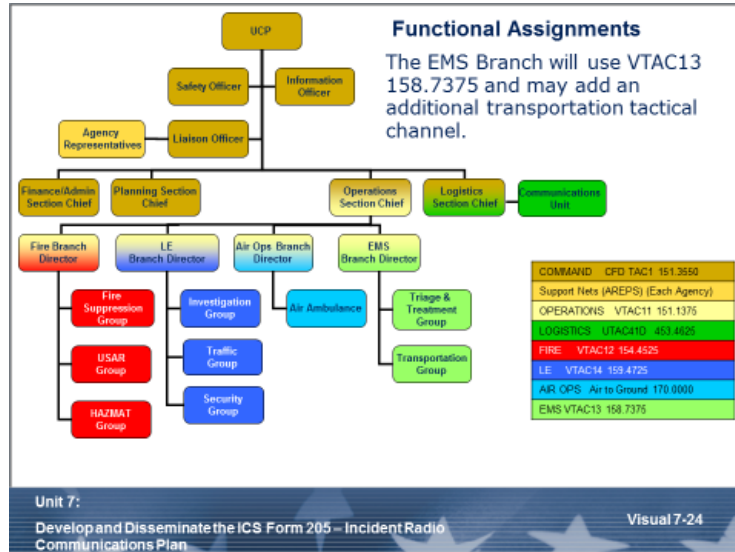
Key Points

Topic Functional Assignments (cont'd)



Key Points

Topic Functional Assignments (cont'd)



Key Points

Unit 7

Develop and Disseminate the Incident Radio Communications Plan (ICS Form 205)

Topic Completion of ICS Form 205

Completion of ICS Form 205

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)

1. Incident Name: COML COURSE		2. Date/Time Prepared: Date: 05/05/2011 Time: 02:31		3. Operational Period: Date From: 05/05/2011 Time From: 0700		Date To: 05/07/2011 Time To: 0700				
4. Basic Radio Channel Use:										
Zone/Grp #	Ch #	Function	Channel Name/Trusted Radio System Talkgroup	Assignment	RX Freq No or W	RX Tone NDC	TX Freq No or W	TX Tone NDC	Mode (A, D, or M)	Remarks
3	1	COMMAND	QFD TACT	COMMAND	152.3525 N	12C.5	152.5525 N	12C.5	A	UNPRED COMMAND
5. Special Instructions:										
6. Prepared by (Communications Unit Leader): Name _____								Signature _____		
ICS 205		IMP Page _____		Date/Time _____						

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-25

Key Points

Topic Completion of ICS Form 205 (cont'd)

Completion of ICS Form 205 (cont'd)

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)

1. Incident Name: COML COURSE		2. Date/Time Prepared: Date: 09/05/2011 Time: 0737		3. Operational Period: Date From: 09/06/2011 Time From: 0730		Date To: 09/07/2011 Time To: 0700				
4. Basic Radio Channel Use:										
Zone/Grp	Ch #	Function	Channel Name/Tracked Radio System Tag/Group	Assignment	RX Freq. M or W	RX Tone RAC	TX Freq. M or W	TX Tone RAC	Mode (A, D, or 18)	Remarks
3	1	COMMAND	CPD-TACS	COMMAND	151.3550 N	136.5	159.5950 N	136.5	A	UNIFIED COMMAND
3	2	TACTICAL	VTRAC11	OPERATIONS	151.1375 N	CSQ	151.1375 N	156.7	A	ARRIS - may need radio programming
5. Special Instructions:										
6. Prepared by (Communications Unit Leader): Name: _____ Signature: _____										
ICS 205		IAP Page _____		Date/Time: _____						

Unit 7: Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan Visual 7-26

Key Points

Topic Completion of ICS Form 205 (cont'd)

Completion of ICS Form 205 (cont'd)

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)

1. Incident Name: COML COURSE			2. Date/Time Prepared: Date: 09/05/2011 Time: 0737			3. Operational Period: Date From: 09/06/2011 Time From: 0730			Date To: 09/07/2011 Time To: 0700		
4. Basic Radio Channel Use:											
Zone/Grp	Ch #	Function	Channel Name/Trunked Radio System/Taggroup	Assignment	RX Freq M or W	RX Tone	TX Freq M or W	TX Tone	Mode (A, D, or 18)	Remarks	
3	1	COMMAND	CPD TACS	COMMAND	151.3550 N	136.5	159.5950 N	136.5	A	UNIFIED COMMAND	
3	2	TACTICAL	VTACL1	OPERATIONS	151.1375 N	CSQ	151.1375 N	156.7	A	ARRIS - may need radio programming	
3	3	TACTICAL	VTACL2	RRR	154.4025 N	CAQ	154.4025 N	156.7	A	W/R need additional tactical channels for special operations	
5. Special Instructions:											
6. Prepared by (Communications Unit Leader): Name: _____ Signature: _____											
ICS 205				IAP Page _____				Date/Time: _____			

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-27

Key Points

Topic Completion of ICS Form 205 (cont'd)

Completion of ICS Form 205 (cont'd)

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)

1. Incident Name: COML COURSE		2. Date/Time Prepared: Date: 09/30/2011 Time: 0727		3. Operational Period: Date From: 09/30/2011 Time From: 0700		Date To: 09/30/2011 Time To: 0700				
4. Basic Radio Channel Use:										
Zone Group	Ch. #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq R or W	RX Tone BNA/C	TX Freq R or W	TX Tone BNA/C	Mode (A, D, or M)	Remarks
3	1	COMMAND	OPD TAC1	COMMAND	159.3550 N	136.5	159.5950 N	136.5	A	UNIFIED COMMAND
3	2	TACTICAL	VTAC13	OPERATIONS	151.1175 N	CSQ	151.1175 N	156.7	A	ARIPs - May need radio programming
3	3	TACTICAL	VTAC12	RRS	154.4525 N	CAQ	154.4525 N	156.7	A	Will need additional tactical channels for special operations
3	4	TACTICAL	VTAC14	LE	159.4725 N	CSQ	159.4725 N	156.7	A	Will need additional tactical channels for special operations
5. Special Instructions:										
6. Prepared by (Communications Unit Leader): Name: _____ Signature: _____										
ICS 205		IAP Page _____		Date/Time: _____						

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-28

Key Points

Topic Completion of ICS Form 205 (cont'd)

Completion of ICS Form 205 (cont'd)

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)

1. Incident Name: COML COURSE		2. Date/Time Prepared: Date: 09/06/2011 Time: 0737		3. Operational Period: Date From: 09/06/2011 Time From: 0700		Date To: 09/07/2011 Time To: 0700				
4. Base Radio Channel Use:										
Zone (Up)	Ch (S)	Function	Channel Name/Trunked Radio System/Tailgroup	Assignment	RX Freq (K or W)	RX Tone (J/M/C)	TX Freq (K or W)	TX Tone (J/M/C)	Mode (A, D, or M)	Remarks
3	1	COMMAND	CFD TACT1	COMMAND	151.3050 N	136.5	159.5950 N	136.5	A	UNFREQ COMMAND
3	2	TACTICAL	VTAC13	OPERATIONS	151.1375 N	C5Q	151.1375 N	156.7	A	ARRPs - May need radio programming
3	3	TACTICAL	VTAC12	FIRE	154.4525 N	CAG	154.4525 N	156.7	A	Will need additional tactical channels for special operations
3	4	TACTICAL	VTAC14	LE	159.4725 N	C5Q	159.4725 N	156.7	A	Will need additional tactical channels for special operations
3	5	AIR	AIR TO GROUND	AIR TO GROUND	170.0000 N	C5Q	170.0000 N	NONE	A	To support EMS operations
5. Special Instructions:										
6. Prepared by (Communications Unit Leader): Name _____ Signature _____										
ICS 205		MAP Page _____		Date/Time _____						

Unit 7: Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan Visual 7-29

Key Points

Topic Completion of ICS Form 205 (cont'd)

Completion of ICS Form 205 (cont'd)

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)										
1. Incident Name: COML COURSE			2. Date/Time Prepared: Date: 09/06/2011 Time: 0737			3. Operational Period: Date From: 09/06/2011 Time From: 0738 Date To: 09/07/2011 Time To: 0738				
4. Radio Channel Use:										
Zone/Grp	Ch #	Function	Channel Name/Trunked Radio System/ Talkgroup	Assignment	RX Freq M or W	RX Tone /NAC	TX Freq M or W	TX Tone /NAC	Mode (A, D, or III)	Remarks
3	1	COMMAND	CFD TAC1	COMMAND	151.3550 N	136.3	159.5950 N	136.5	A	UNIFIED COMMAND
3	2	TACTICAL	VTAC11	OPERATIONS	151.1375 N	CSQ	151.1375 N	156.7	A	ARPS- May need radio programming
3	3	TACTICAL	VTAC12	FIRE	154.4525 N	C4Q	154.4525 N	156.7	A	Will need additional tactical channels for special operations
3	4	TACTICAL	VTAC14	LE	159.4725 N	CSQ	159.4725 N	156.7	A	Will need additional tactical channels for special operations
5	5	AIR	AIR TO GROUND	AIR TO GROUND	170.0000 N	CSQ	170.0000 N	NDNTE	A	To support EMS operations
5	6	TACTICAL	VTAC15	EMS	158.7975 N	CSQ	158.7975 N	156.7	A	Will need additional channel for transportation
5. Special Instructions:										
6. Prepared by (Communications Unit Leader): Name: _____ Signature: _____										
ICS 205		MAP Page		Date/Time						

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan
Visual 7-30

Key Points

Topic Completion of ICS Form 205 (cont'd)

Completion of ICS Form 205 (cont'd)

INCIDENT RADIO COMMUNICATIONS PLAN (ICS205)										
1. Incident Name: COML COURSE			2. Date/Time Prepared: Date: 09/06/2011 Time: 0737			3. Operational Period: Date From: 09/06/2011 Time From: 0700 Date To: 09/07/2011 Time To: 0700				
4. Basic Radio Channel Use:										
Zone	Ch	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone (NAC)	TX Freq N or W	TX Tone (NAC)	Mode (A, D, or M)	Remarks
1	1	COMMAND	CRD TAC1	COMMAND	151.3050 N	136.5	159.5950 N	136.5	A	UNIFIED COMMAND
1	2	TACTICAL	VTACL1	OPERATIONS	151.3375 N	CSQ	151.3375 N	156.7	A	AREPA - May need radio programming
1	3	TACTICAL	VTACL2	FIRE	154.4525 N	CAQ	154.4525 N	156.7	A	Will need additional tactical channels for special operations
1	4	TACTICAL	VTACL4	LE	159.4725 N	CSQ	159.4725 N	156.7	A	Will need additional tactical channels for special operations
1	5	AIR	AIR TO GROUND	AIR TO GROUND	170.0000 N	CSQ	170.0000 N	NONE	A	To support EMS operations
1	6	TACTICAL	VTACL3	EMS	158.7375 N	CSQ	158.7375 N	156.7	A	Will need additional channel for transportation
5. Special Instructions:										
Contact the Incident Communications Center (ICC) for additional tactical channels and communication support needs. COML will coordinate with the COMC for additional channels as needed. Advise the ICC of any communication issues.										
6. Prepared by (Communications Unit Leader): Name: <u>S. McElvene, COML</u> Signature: <u>S. McElvene</u>										
ICS 205 IAP Page: _____ Date/Time: 09/06/2011 / 0737										

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan
Visual 7-31

Key Points

TopicIncident Radio Communications Plan Sensitive Info

Incident Radio Communications Plan Sensitive Info

- Generally, IAPs become public information and radio programming information may become compromised through general distribution of the IAP beyond incident personnel.

Unit 7:
Develop and Disseminate the ICS Form 205 - Incident Radio
Communications Plan

Visual 7-32

Key Points

Regardless of how tightly you keep ICS Forms 205 or 217A, don't consider any channel secure unless it is encrypted.

Topic Incident Radio Communications Plan Sensitive Inform (cont'd)

Incident Radio Communications Plan Sensitive Info (cont'd)

- **Department of Homeland Security (DHS) restricts the publication of detailed frequency and programming information regarding Urban Search & Rescue (USAR) and Disaster Medical Assistance Team (DMAT) channels to DHS -authorized personnel who have obtained the necessary clearances.**
- **Therefore, US&R and DMAT frequencies will not be published on an ICS 205, even if known to the COML.**
- **This same philosophy may apply to Bomb Squad, SWAT team, military teams, intelligence gathering, or other channels being used.**

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-33

Key Points

Incident Radio Communications Plan Sensitive Info (cont'd)

Encryption

- Agencies using encrypted radios that are included in a Gateway connection need to be aware all their transmissions will be unencrypted on the connected clear channels



Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan

Visual 7-34

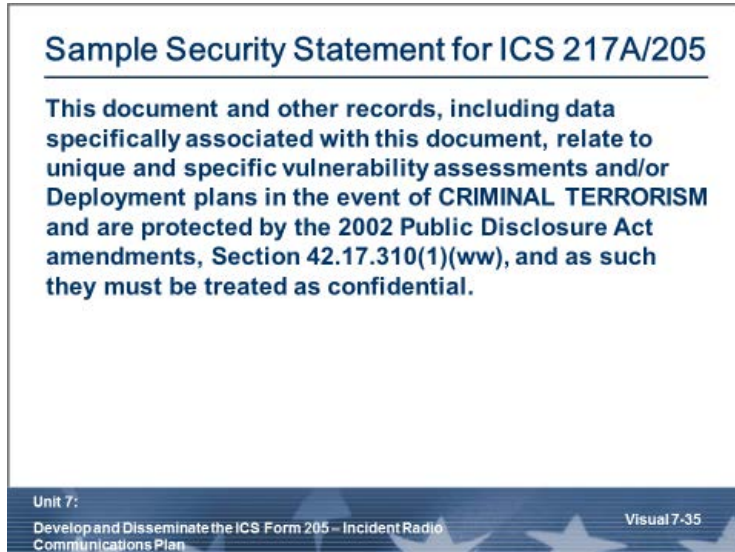
Key Points

Encryption many times can be a hindrance to interoperability. All encryption is not equal.

Key management is critical to maintaining effectiveness and interoperability.

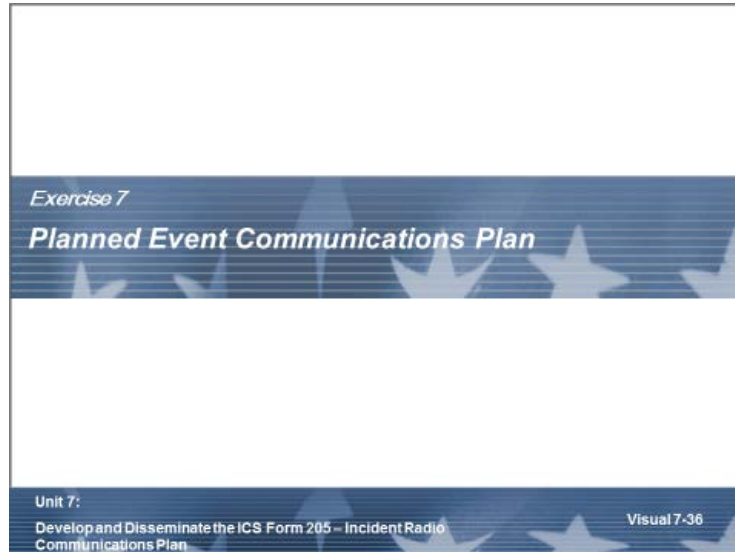
Key management will likely not be delegated to the Communications Unit Leader. It is important that the Communications Unit Leader identify and work with the system managers responsible for key management.

TopicSample Security Statement for ICS 217A/205

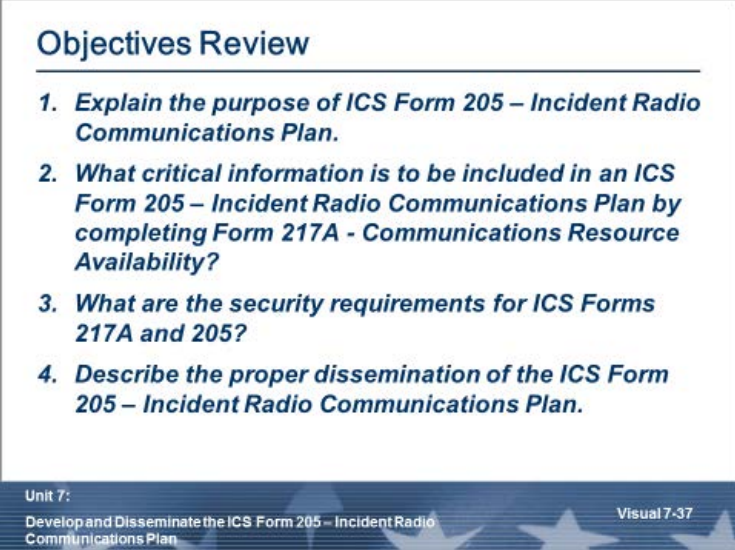
**Key Points**

Topic

Exercise 7: Planned Event Communications Plan

**Key Points**

The purpose of Exercise 7 is to complete an Incident Radio Communications Plan (ICS Form 205) to provide a command and tactical channels for all resources. This exercise is scheduled to last approximately 45 minutes. The instructor will use a build slide to demonstrate how to complete a blank Incident Radio Communications Plan (ICS Form 205). Based on this information the students will discuss the significance of the information received and what conclusions to draw as they create a simple ICS Form 205.

A slide titled "Objectives Review" with a list of four objectives. The slide has a blue header and footer. The footer contains the text "Unit 7: Develop and Disseminate the ICS Form 205 – Incident Radio Communications Plan" and "Visual 7-37".

Objectives Review

1. *Explain the purpose of ICS Form 205 – Incident Radio Communications Plan.*
2. *What critical information is to be included in an ICS Form 205 – Incident Radio Communications Plan by completing Form 217A - Communications Resource Availability?*
3. *What are the security requirements for ICS Forms 217A and 205?*
4. *Describe the proper dissemination of the ICS Form 205 – Incident Radio Communications Plan.*

Unit 7:
Develop and Disseminate the ICS Form 205 – Incident Radio
Communications Plan

Visual 7-37

Key Points

Unit Terminal Objectives

At the end of this unit, students will be able to create and publish a properly constructed ICS Form 205 Incident Radio Communications Plan. The student will also complete Communications Resource Availability (Form 217A).

Unit Enabling Objectives

- Explain the purpose of Incident Radio Communications Plan (ICS Form 205)
- Identify critical information to be included in an Incident Radio Communications Plan (ICS Form 205) by completing Communications Resource Availability (Form 217A)
- Identify security requirements for ICS Forms 217A and 205
- Describe the proper dissemination of the Incident Radio Communications Plan (ICS Form 205)

Topic

Questions?



Key Points

Unit 8: Incident Communications Centers (ICC)

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Identify Communications Unit Leader responsibilities in establishing an Incident Communications Center (ICC) as well as manage all incident communications needs, personnel, and the ICC
- Discuss working relationships within the Communications Unit
- Discuss methods of organizing unit personnel
- Discuss important considerations in laying out the Communications Unit area
- Identify and discuss the interactions between the Communications Unit Leader and key individuals and sub-organizations
- Identify responsibilities of the Communications Unit positions
- Describe Communications Unit Leader responsibilities at the ICC

Methodology

This unit features lecture, discussion based activities, and an exercise.

Knowledge of unit content will be evaluated through the administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of Exercise 8.

Utilizing ICS Form - 217A Communications Resources Availability Worksheet created in Exercise 7, the purpose of Exercise 8 is to design a communications system, taking into consideration the needs of the agencies that students may consider as likely responders. The exercise is scheduled to last approximately 45 minutes, involving the instructor reading from a script from the City of Central City scenario. Based on this information, the students will discuss the significance of the information received and what conclusions to draw as they create a communications system.

The purpose of this unit is to provide students information needed to identify Communications Unit Leader responsibilities in establishing an ICC as well as an idea of how to effectively manage themselves and others in the Communications Unit during an incident, including staffing and supplying of the ICC.

Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	1 hour
Exercise 8	45 minutes
Total Time	1 hour, and 45 minutes

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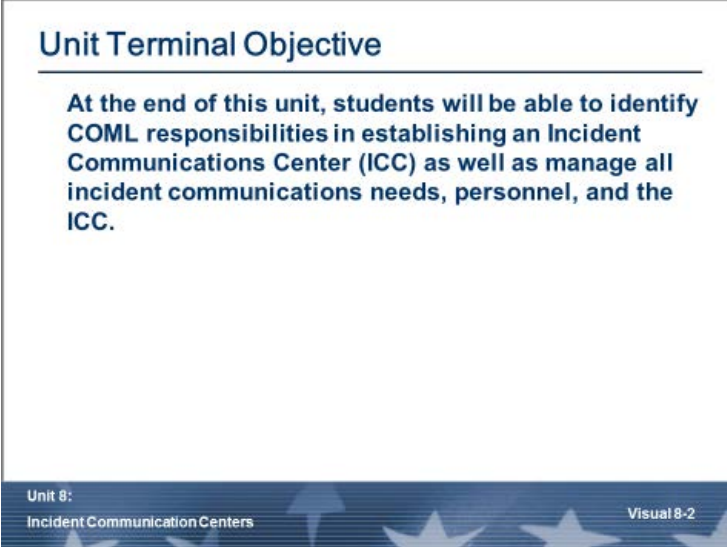
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective

A slide titled "Unit Terminal Objective" with a blue header and footer. The main text is in blue and reads: "At the end of this unit, students will be able to identify COML responsibilities in establishing an Incident Communications Center (ICC) as well as manage all incident communications needs, personnel, and the ICC." The footer contains "Unit 8: Incident Communication Centers" on the left and "Visual 8-2" on the right.

Unit Terminal Objective

At the end of this unit, students will be able to identify COML responsibilities in establishing an Incident Communications Center (ICC) as well as manage all incident communications needs, personnel, and the ICC.

Unit 8:
Incident Communication Centers

Visual 8-2

Key Points

Unit Terminal Objective

At the end of this unit, students will be able to identify Communications Unit Leader responsibilities in establishing an Incident Communications Center (ICC) as well as manage all incident communications needs, personnel, and the ICC.

Unit Enabling Objectives


- Discuss working relationships within the Communications Unit
- Discuss methods of organizing unit personnel
- Discuss important considerations in laying out the Communications Unit area
- Identify and discuss the interactions between the Communications Unit Leader and key individuals and sub-organizations
- Identify responsibilities of the Communications Unit positions

Topic Location of an ICC

Location of an ICC

Urban considerations:

- Manage the incident from the dispatch center or an ICC?
- Locate away from high traffic areas and noise
- Locate away from radio frequency and electronic noise
- Locate close to Incident Command Post



Unit 8:
Incident Communication Centers

Visual 8-3

Key Points

Consider safe and proper environment for staff.

There are a number of considerations and concerns when establishing an ICC, including the following:

- The location must be safe, first of all, so as not to distract resources from the actual incident response in the event of an emergency
- The site must be large enough that individual workstations do not interfere with one another and it can accommodate the potential growth of the incident
- The area must be located away from radio frequency and electronic noise, such as communication towers, refrigeration trucks, and electrical generators
- The ICC should also be close to the ICP and the Medical Unit to relay orders such as Medevac requests quickly
- The Incident Command Post (ICP) will have significant electrical power requirements, of course, and should be located close to a source of power

Topic ICC Facilities

ICC Facilities

- **Mobile Communications Center**
- **Tent**
- **School or Commercial Building (hotel room)**
- **Mobile Command or Communications Vehicle**
- **Physical Configuration**
 - **Workstations-Radio, telephone, computer**
 - **Resources -Office Supplies, ICS forms, IAP, Maps**



Unit 8:
Incident Communication Centers

Visual 8-4

Key Points

A Mobile Communications Center is a large, RV-like vehicle with a variety of communications equipment already installed, and capable of numerous other connections such as data links, cell reception, and satellite feeds.

A Mobile Command Vehicle is similar to a Mobile Communications vehicle, though specifically designed to support command functions. It often has a dedicated communications area; however, that may be suitable for a Communications Unit Leader's needs.

A tent may be the most a Communications Unit Leader can expect in certain rural environments, though these have the advantage of being relatively cheap and mobile.

School or commercial building may also be used as a communications facility.

Topic Mobile Communications Centers

Mobile Communication Centers

- Technical and Operational Resources
- Mobile Communications Centers



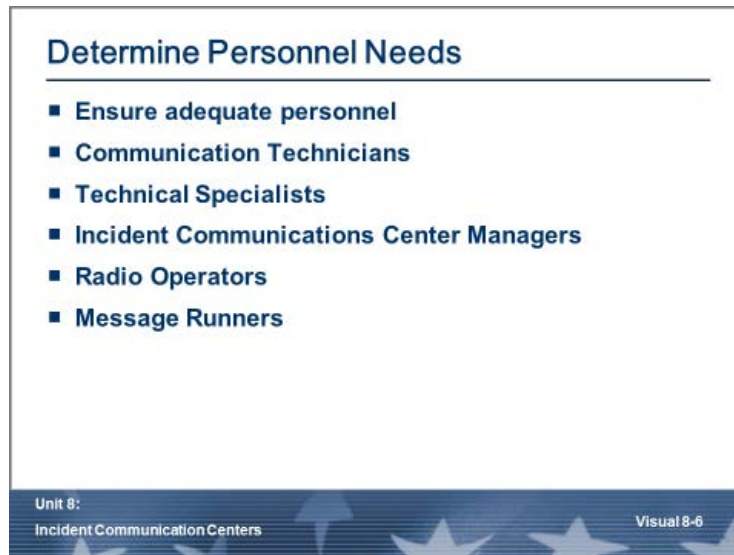
Unit 8:
Incident Communication Centers

Visual 8-5

Key Points

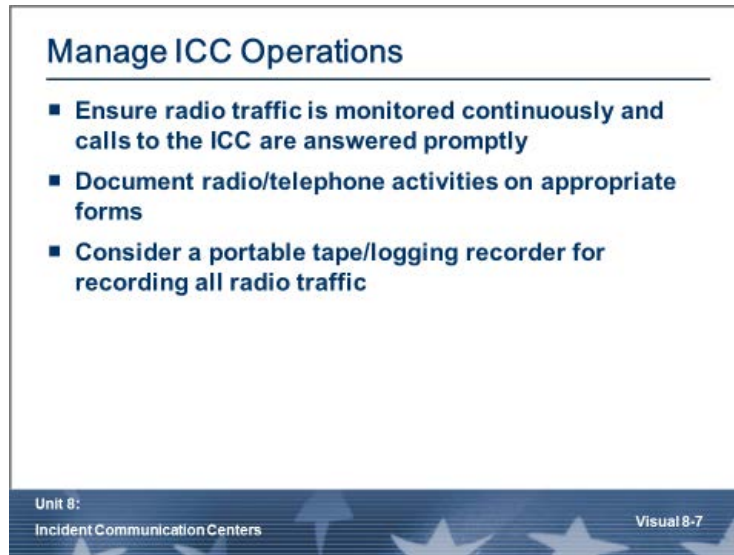
National typing of these resources is still in development.

Topic Determine Personnel Needs

**Key Points**

- Runners can be useful to assist in distributing general messages; they are agents of spectrum efficiency
- Ensure you have adequate personnel to staff the ICC
- Allow for response time of personnel
- Have sufficient communications and Technical Specialists to make the ICC operational
- The ICC Manager will supervise the radio operators and runners

Topic Manage ICC Operations

**Key Points**

Ensure all radio traffic is monitored.

Document radio/phone activities on the appropriate form Communications Log (Form 309). Use the General Message (ICS Form 213) to communicate messages to the appropriate party and relay information back to the field.

Maintain contact with the local dispatch center.

Be prepared for the “incident within the incident”:

- Firefighters suffering from heat exhaustion
- SWAT Officer is the victim of a gunshot wound
- The scheduled or unscheduled arrival of visiting dignitaries
- Ensure that Communication staff are briefed on the Medical Plan (ICS Form 206)

TopicLocal Dispatch Center

Local Dispatch Center

- **Maintain contact with the local dispatch center through an interoperability channel or talk group**
 - **Phone Line**
 - **Internet Connection**
 - **Fax**
 - **E-mail/Scan**



Unit 8:
Incident Communication Centers

Visual 8-9


Key Points

Topic Incident Within the Incident

Incident Within the Incident

- Prepare incident-within-an-incident response plans prior to their need. Include national medical incident protocol in response plans.
 - Auto accident with injuries involving responders
 - Firefighter suffering heat exhaustion
 - SWAT Officer is a victim of a gunshot wound
 - Dignitaries' (un) scheduled site visit

Handout 8-1: Communications Center Protocol
Handout 8-2: Medical Emergency Procedure Plan
Handout 8-3: Expanded ICS 206 Medical Plan



Unit 8:
Incident Communication Centers

Visual 8-10

Key Points

- The Communications Unit must have specific protocols in place on dealing with an incident within the incident
- The protocol should consider what information should be released over the radio if an incident within the incident occurs
- Dedicate appropriate air time to an incident within the incident, but don't stop primary incident response; consider your ability to move this incident to a tactical channel
- Situations may occur where providing care to responders in contrast to the victims of the incident becomes the priority
- Be familiar with the Medical Plan in the Incident Action Plan

Topic Determine Supply Needs

Determine Supply Needs

- Maintain quantities of supplies at a level to prevent shortage of any basic needed items
- Maintain supplies according to:
 - Current resource orders
 - Projected growth of the incident
 - Projected number of personnel in the ICC
- General Guideline: When placing initial supply order, plan for approximately three days

Unit 8:
Incident Communication Centers

Visual 8-11

Key Points

- Take inventory
 - In the urban environment, portable battery chargers and a reliable power source are critical
- Maintain supplies according to:
 - Current resource orders
 - Projected growth of the incident
 - Projected number of personnel in the ICC
- Make sure that you have ordered well in advance and in sufficient quantities

TopicMaintain Quantity

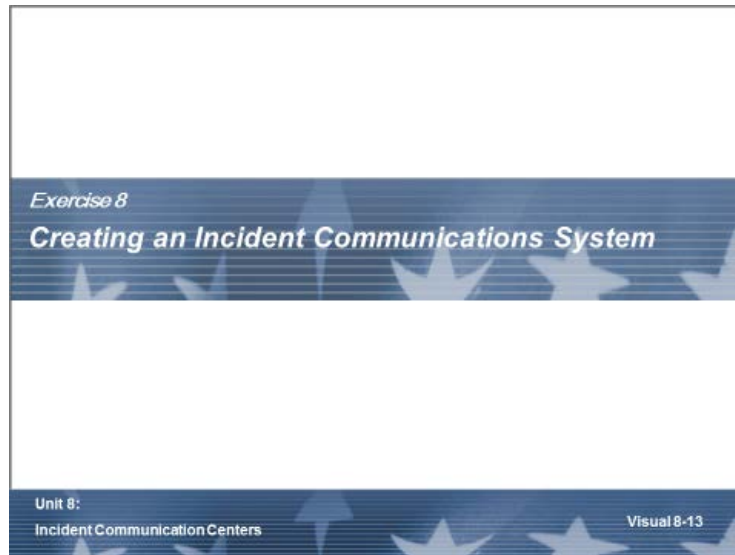
Maintain Quantity

- **Take inventory**
- **Determine battery needs**
- **Portable battery chargers in an urban environment**
- **Consider the need for cell phone chargers and other portable electronic devices**
- **General Guideline: Order 2 changes of batteries per radio, per operational period**

Unit 8:
Incident Communication Centers

Visual 8-12

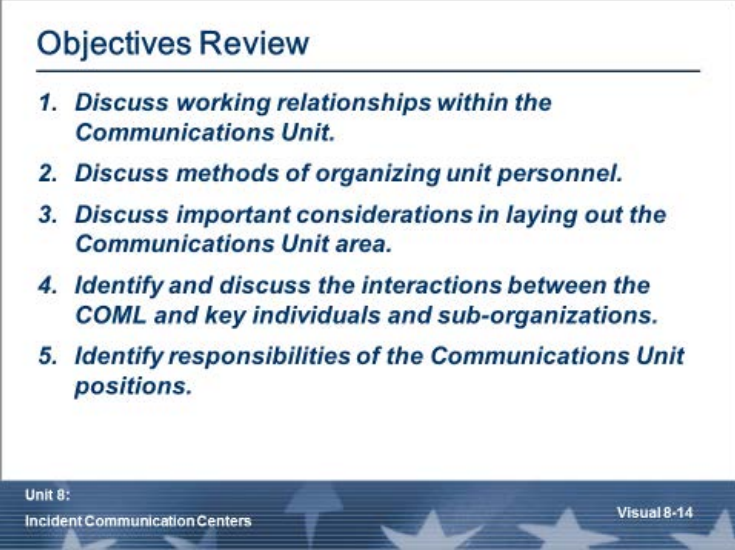
Key Points



Key Points

The purpose of Exercise 8 is to design a communications system, taking into consideration the needs of the agencies that students may consider as likely responders. The exercise is scheduled to last approximately 45 minutes, involving the instructor reading updates regarding Central City. Based on this information, students will discuss the significance of the information received and what conclusions to draw as they create a communications system.

Topic Objectives Review

A slide titled "Objectives Review" with a list of five objectives. The slide has a blue footer with the text "Unit 8: Incident Communication Centers" and "Visual 8-14".

Objectives Review

1. *Discuss working relationships within the Communications Unit.*
2. *Discuss methods of organizing unit personnel.*
3. *Discuss important considerations in laying out the Communications Unit area.*
4. *Identify and discuss the interactions between the COML and key individuals and sub-organizations.*
5. *Identify responsibilities of the Communications Unit positions.*

Unit 8:
Incident Communication Centers

Visual 8-14

Key Points

Unit Terminal Objective

At the end of this unit, students will be able to identify Communications Unit Leader responsibilities in establishing an Incident Communications Center (ICC) as well as manage all incident communications needs, personnel, and the ICC.

Unit Enabling Objectives

- Discuss working relationships within the Communications Unit
- Discuss methods of organizing unit personnel
- Discuss important considerations in laying out the Communications Unit area
- Identify and discuss the interactions between the Communications Unit Leader and key individuals and sub-organizations
- Identify responsibilities of the Communications Unit positions

Topic

Questions?



Key Points

Unit 9: Personnel Management

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Describe requirements of personnel management
- Determine personnel requirements
- Conduct Communications Unit briefings
- Describe personnel welfare requirements
- Identify personnel management documentation

Methodology

This unit features lecture, discussion-based activities, and an exercise.

Knowledge of unit content will be evaluated through the administration of the final exam (to be administered upon completion of the course). Instructors will evaluate students' initial understanding through facilitation of Exercise 9.

The purpose of Exercise 9 is to create an ICS Form 205: Incident Radio Communications Plan to address command and tactical channel assignments. The exercise is scheduled to last approximately 45 minutes, involving the instructor reading from a script from the City of Central City scenario. Based on this information, the students will discuss the significance of the information received and what conclusions to draw as they create ICS Form 205.

The purpose of this unit is to provide students information needed to identify Communications Unit Leader responsibilities in managing personnel.

Time Plan

A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	30 minutes
Exercise 9	45 minutes
Total Time	1 hour, 15 minutes

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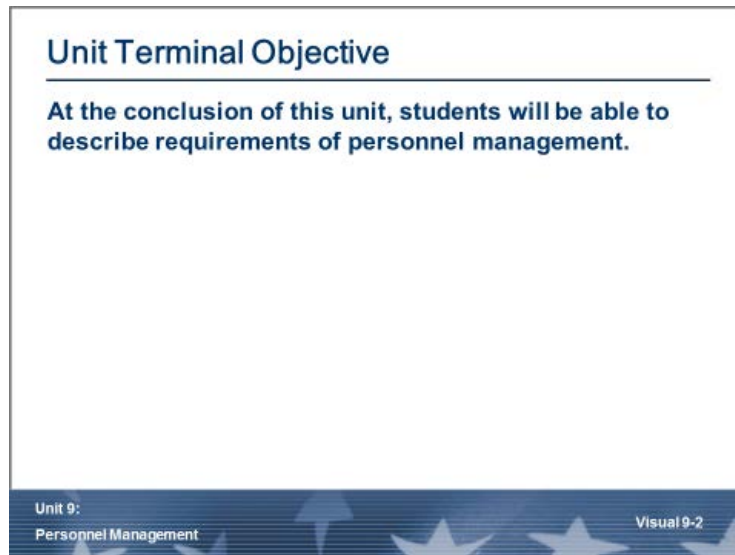
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective



Key Points

Unit Terminal Objective

At the conclusion of this unit, students will be able to describe requirements of personnel management.


Unit Enabling Objectives

- Determine personnel requirements
- Conduct Communications Unit Briefings
- Describe personnel welfare requirements
- Identify personnel management documentation

Topic Assess Personnel Requirements

Assess Personnel Requirements

- Complexity of the incident
- Anticipated duration of the incident
- Shift scheduling



Unit 9:
Personnel Management

Visual 9-3

Key Points

Make the assessment by the complexity and expected duration of the incident as indicated by the Incident Action Plan (IAP) or Incident Briefing form ICS 201.

TopicOrdering Personnel

Ordering Personnel

- **Order by assignment and Incident Command System (ICS) position**
 - **INCM: Incident Communications Center Manager**
 - **COMT: Incident Communications Technician**
 - **RADO: Radio Operator**
 - **THSP: Technical Specialist**
- **Qualifications?**

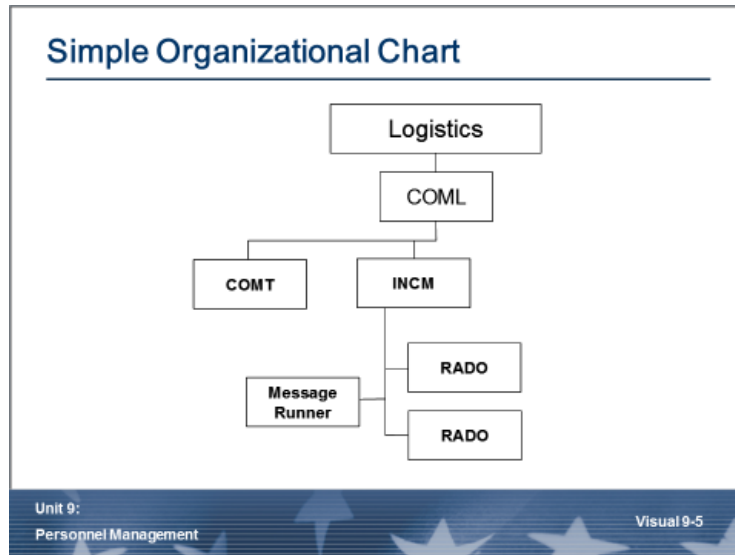
Unit 9:
Personnel Management

Visual 9-4

Key Points

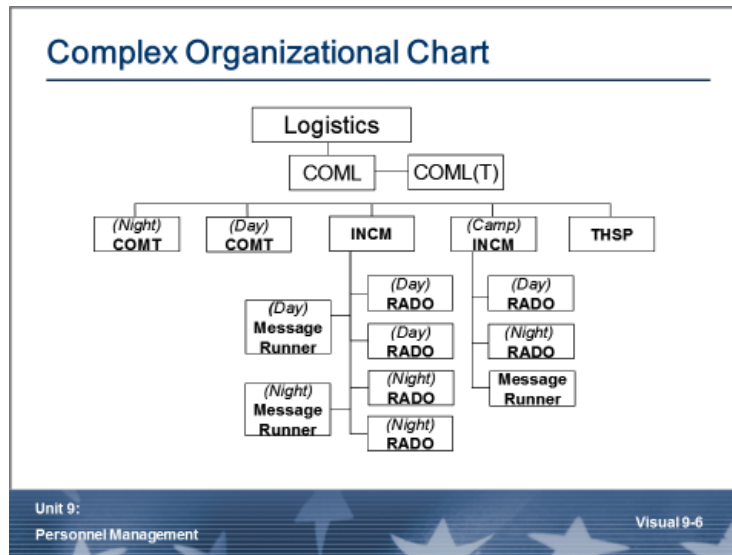
If you are looking for a specialist, be specific on what you want them to be able to do.

Topic Simple Organization Chart



Key Points

Topic Complex Organization Chart



Key Points

You may have a second Communications Unit Leader if you are running two shifts, however there should be a primary.

Topic Unit Personnel Briefing

Unit Personnel Briefing

- Brief and keep staff informed and updated
 - Operational period changes
 - After operational period briefing
 - New personnel to the unit
 - Daily changes
 - Current IAP
 - Current equipment locations

PIR Fresh Fit 600
Incident Action Plan
April 10, 2010

Unit 9:
Personnel Management

Visual 9-7


Key Points

This is where the Communications Unit Leader should make GIS products available.

- Review the Incident Action Plan (IAP)
 - The Incident Communications Plan (ICS Form 205)
 - The Division Assignments Lists (ICS Form 204)
 - The Medical Plan (ICS Form 206) if available
- Review the ICS Form 201 if the IAP is not available
 - Assigned frequencies/talkgroups
 - Current and ordered resources
 - Map of the incident

Teamwork

- Hold unit meetings
- Share information
- Provide a map of the incident
- Maintain a positive attitude
- Promote teamwork to accomplish tasks



Unit 9:
Personnel Management

Visual 9-8

Key Points

Promote Communications Unit cohesiveness.

Topic Personnel Welfare

Personnel Welfare

- Provide a safe and comfortable environment
- Equal Opportunity Laws
- Civil Rights Laws
- Freedom from sexual harassment
- Application of the Fair Labor Standards Act
- Critical incident stress management
- Work and rest guidelines
- Union shop regulations (local)
- Mutual Respect is key



Unit 9:
Personnel Management

Visual 9-9

Key Points

What makes a safe and comfortable working environment?

- Personnel welfare
- The Communications Unit Leader is responsible for the welfare of the personnel assigned to the Communications Unit
- The concept of mutual respect can go a long way in all personnel management activities


What rules and regulations still apply even though this is not the normal workplace?

- Seize the first opportunity available to establish a professional work environment
- Be proactive in resolving these issues
- If you are not typically in a supervisory role, you should seek out additional training and support

Topic Managing Technical Staff

Managing Technical Staff

- Understanding a task and technical proficiency in it are not the same thing
- Rely on subordinates' knowledge
- Trust staff and be honest about abilities



Unit 9:
Personnel Management

Visual 9-10

Key Points

Because incident communications can be highly technical, a Communications Unit Leader works with staff whose technical knowledge may exceed his or her own.

In these instances, it is important for the Communications Unit Leader to work to understand the overall task, its implementation, and its implications for the incident. The Communications Unit Leader is not responsible for understanding the technical details for every task.

Instead, Communications Unit Leaders rely on their subordinates' knowledge. Communications Unit Leaders trust staff to be honest about their abilities and provide him or her with accurate information about a technical task.

Topic Safety and Risk Management Process

Safety and Risk Management Process

- You are responsible for your people
- What is the risk management process?
- Definition: A process of evaluating and mitigating hazards in the work environment
- Steps of the risk management process:
 - Situational awareness
 - Hazard assessment
 - Hazard control
 - Decision point
 - Evaluate



Unit 9:
Personnel Management

Visual 9-11


Key Points

Ensure that mitigations are carried out. Simply reporting them is not sufficient.

Topic Personnel Documentation Management

Personnel Documentation Management

- Complete personnel evaluations
- Maintain timekeeping records
- Maintain an Activity Log (ICS Form 214)



The image shows a slide titled "Personnel Documentation Management" with three bullet points: "Complete personnel evaluations", "Maintain timekeeping records", and "Maintain an Activity Log (ICS Form 214)". To the right of the text is a thumbnail of the ICS Form 214, which is a grid-based activity log with columns for "Activity", "Start Time", and "End Time". The slide also features a footer with "Unit 9: Personnel Management" and "Visual 9-12".

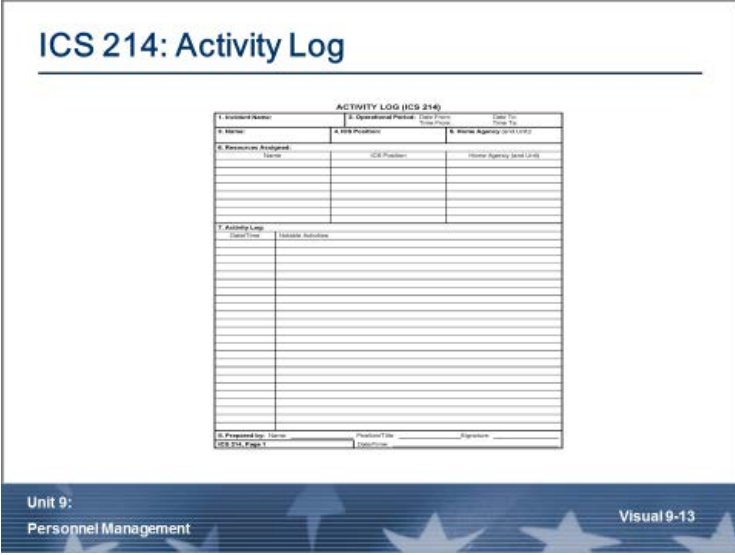
Unit 9:
Personnel Management

Visual 9-12

Key Points

- Completing personnel evaluations will help Unit personnel improve their performance and learn from an incident
- Maintaining required or appropriate timekeeping records is critical for financial management of the incident
- Maintaining an Activity Log (ICS Form 214) allows for an after-action review of the Communications Unit's tactics and radio traffic

Topic ICS 214: Activity Log



The image shows a form titled "ICS 214: Activity Log" with a header "ACTIVITY LOG (ICS 214)". The form is divided into several sections:

- 1. Incident Number:** A field for recording the incident number.
- 2. Operational Period:** Fields for "Date/Time" and "Start/Stop".
- 3. Personnel Assigned:** A table with columns for "Name", "ICS Position", and "Home Agency (or ICS)".
- 4. Activity Log:** A large table with columns for "Date/Time" and "Incident Activities".
- 5. Prepared By:** Fields for "Name", "Position Title", and "Signature".

At the bottom of the form, it says "ICS 214, Page 1". The form is presented within a blue-bordered box with a decorative footer containing "Unit 9: Personnel Management" and "Visual 9-13".

Key Points
Purpose

The Activity Log is used to record details of unit activity. The file of these logs provides a basic reference from which to extract information for conclusion in an after-action report.

Initiation of Log

An Activity Log is initiated and maintained by the Communications Unit Leader. It should only be a recording of major events, not every action.

Distribution

The Documentation Unit maintains a file of all Activity Logs. It is necessary that one copy of each log be submitted to the Documentation Unit. If there is no Documentation Unit, the form goes to the Planning Unit.

Topic

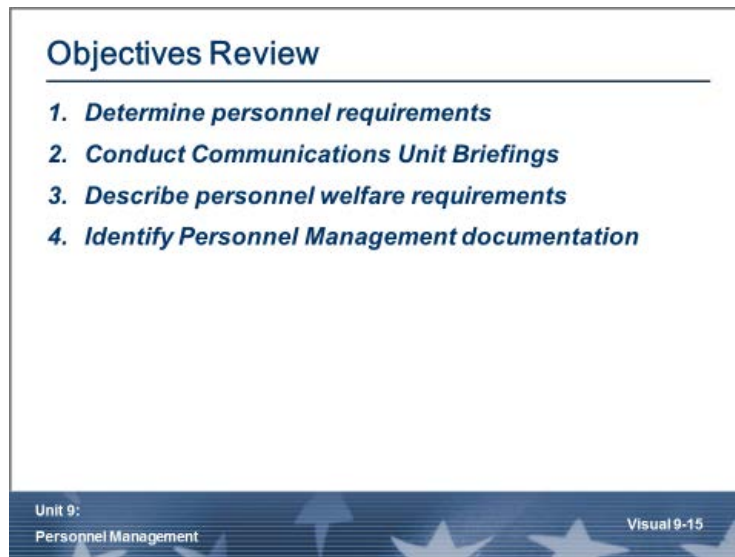
Exercise 9: Communications Nets



Key Points

The purpose of Exercise 9 is to create an ICS Form 205: Incident Radio Communications Plan to address command and tactical channel assignments. Consider assigning tactical channels for current and potential responders. The exercise is scheduled to last approximately 45 minutes, involving the instructor reading from a script from the City of Central City scenario. Based on this information, students will discuss the significance of the information received and what conclusions to draw as they create an ICS Form 205.

Topic Objectives Review

**Key Points**

Unit Terminal Objective

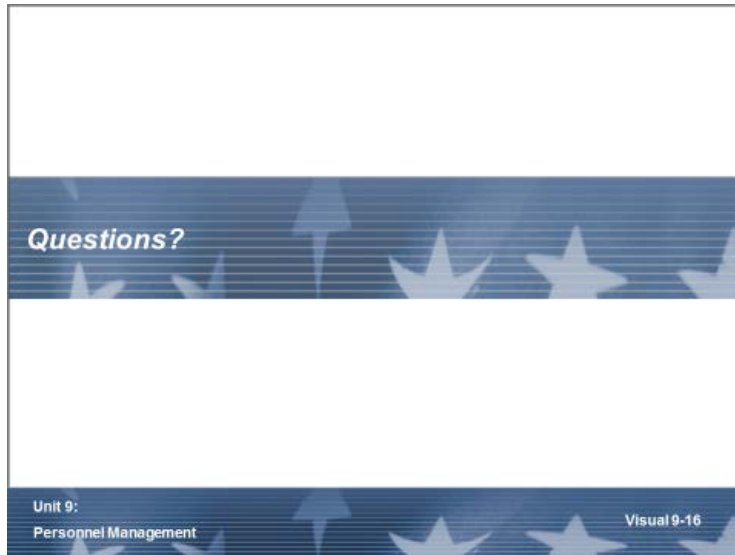
At the conclusion of this unit, students will be able to describe requirements of personnel management.

Unit Enabling Objectives

- Determine personnel requirements
- Conduct Communications Unit Briefings
- Describe personnel welfare requirements
- Identify personnel management documentation

Topic

Questions?



Key Points

Unit 10: Demobilization and Position Task Book

STUDENT GUIDE

Objectives

By the end of this unit, students will be able to:

- Describe the Communications Unit Leader roles and responsibilities for demobilization/transition from an incident
- Describe the components for the demobilization plan and procedure involved in demobilization (including steps of anticipating demobilization, equipment procedures and personnel procedures)
- Identify the required documentation submitted during demobilization
- Describe the procedure for a properly conducted AAR
- Discuss the difference in tasks between demobilization and transition
- Describe the qualification process for the Communications Unit Leader
- Identify components of the Communications Unit Leader Response Kit

Methodology

This unit incorporates lecture, discussion-based activities, and an exercise.

Instructors will evaluate students' initial understanding of this unit through facilitation of Exercise 10. The purpose of Exercise 10 is to provide the participants with an opportunity to identify functions essential to the Communications Unit Leader that they perform regularly at their daily jobs.

The purpose of this unit is to assist students in preparing for and managing the demobilization/transition of unit personnel and equipment. This unit will also provide students with an orientation to the qualification process for the Communications Unit Leader position.

Time Plan

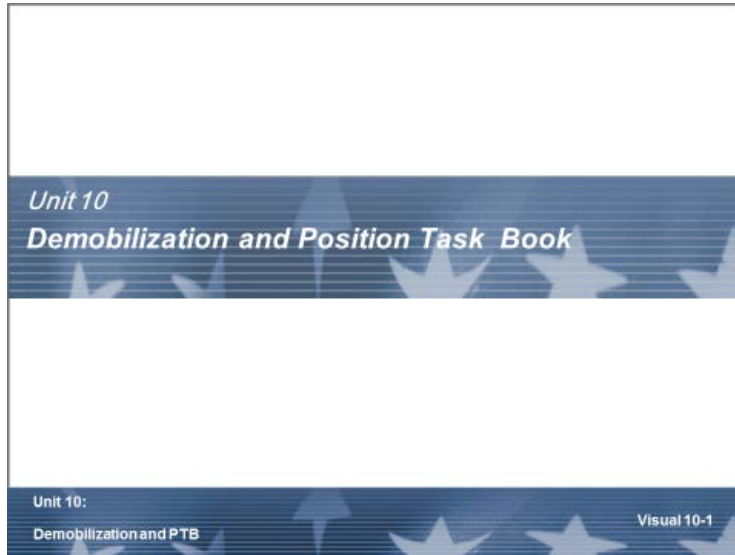
A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	1 hour
Exercise	30 minutes
Total Time	1 hour, 30 minutes

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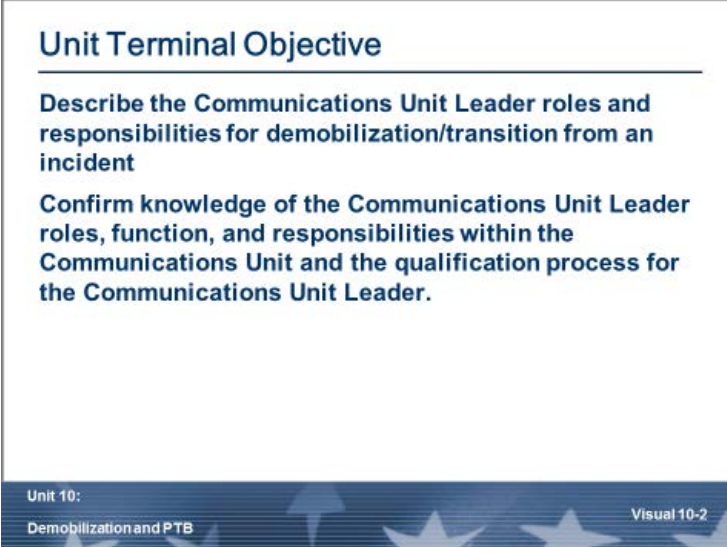
Topic

Unit Title Slide



Key Points

Topic Unit Terminal Objective

A slide titled "Unit Terminal Objective" with a blue header and footer. The main content is in a white box with a blue border. The text inside the box reads: "Describe the Communications Unit Leader roles and responsibilities for demobilization/transition from an incident" and "Confirm knowledge of the Communications Unit Leader roles, function, and responsibilities within the Communications Unit and the qualification process for the Communications Unit Leader." The footer contains "Unit 10: Demobilization and PTB" and "Visual 10-2".

Unit Terminal Objective

Describe the Communications Unit Leader roles and responsibilities for demobilization/transition from an incident

Confirm knowledge of the Communications Unit Leader roles, function, and responsibilities within the Communications Unit and the qualification process for the Communications Unit Leader.

Unit 10:
Demobilization and PTB

Visual 10-2

Key Points

Unit Terminal Objective

At the end of this unit, students will be able to describe the Communications Unit Leader roles and responsibilities for demobilization/transition from an incident.

Unit Enabling Objectives

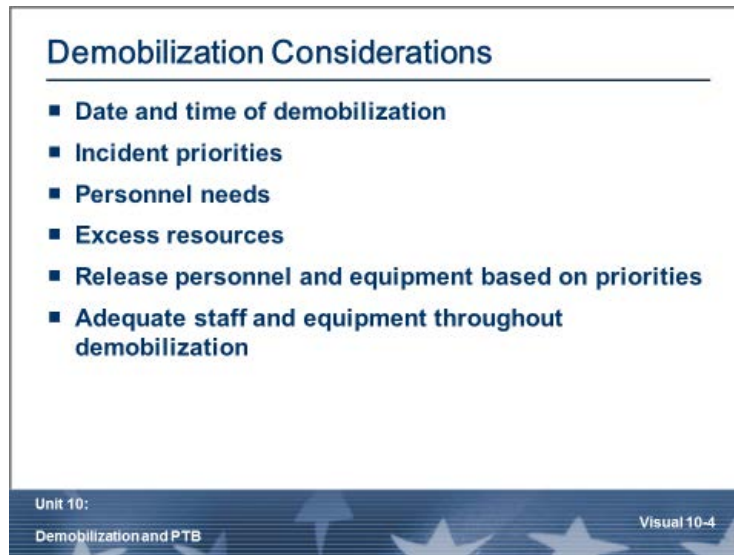
- Describe the components for the demobilization plan and procedure involved in demobilization (including steps of anticipating demobilization, equipment procedures and personnel procedures)
- Identify the required documentation submitted during demobilization
- Describe the procedure for a properly conducted AAR
- Discuss the difference in tasks between demobilization and transition
- Describe the qualification process for the Communications Unit Leader
- Identify components of the Communications Unit Leader Response Kit

Topic Demobilization Plan

**Key Points**

- It is not getting into your department-issued vehicle and driving off into the sunset
 - Demobilization planning begins upon arrival
 - What Communications Unit resources are to be released?
 - When can the resources be released?
 - Is the demobilization checkout form, ICS Form 221, ready for distribution?
 - The Incident Commander establishes the date and time demobilization begins
- Demobilization starts well before arrival and includes equipment demobilization and rehabilitation plans designed in advance.

Topic Demobilization Considerations

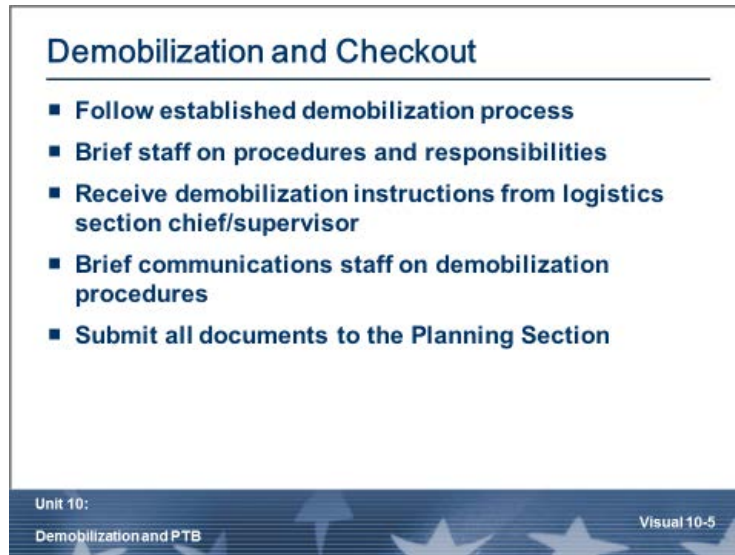
**Key Points**

The Communications Unit Leader must:

- Know the exact date and time of the planned demobilization, and treat it as a deadline
- Discuss incident priorities with other sections so that if demobilization occurs in a phased fashion the operations of other sections will not be affected
- Know, through discussions with their supervisor, whether the Communications Unit personnel and equipment will be transitioning elsewhere, or if they will be released
- Attempt to phase out of the incident by identifying supplies and personnel no longer required or in use, and release them accordingly

Gateway deactivation requires an announcement that the gateway is being terminated and confirmation from all units using the gateway that they are returning to normal operating channels/talkgroups. Announcements are made on shared channels that the incident is being terminated, to return to normal operating channels/talkgroups and acknowledged by units using the shared channel.

Topic Demobilization and Checkout

**Key Points**

Upon receipt of the instructions to demobilize, which usually come from the Logistics Section Chief, the Communications Unit Leader must brief their staff on the demobilization procedure and the Communications Unit's responsibilities.

The Communications Unit Leader must post a copy of the demobilization plan, emphasizing adherence to work/rest guidelines, and establishing check in/check out procedures for crews and overhead personnel as they return their equipment and leave the incident.

The Communications Unit Leader must ensure that accurate inventory is maintained, communications equipment is prepared for demobilization, and equipment is stored properly in preparation for shipment.

Topic Equipment Demobilization (cont'd)

Equipment Demobilization (cont'd)

- All equipment is accounted for and returned to the appropriate agency
- Issues with lost or damaged equipment are resolved
- Equipment is rehabilitated and ready for the next assignment
- What ideas do you have to ensure the return of issued communications equipment?

Unit 10:
Demobilization and PTB

Visual 10-7

Key Points

Topic Closing Incident vs. Transition

Closing Incident vs. Transition

- **Transition - New team arrives to replace current Communications Unit**
- **Closing Incident - Incident is scaling down, personnel and equipment sent back/reassigned accordingly**
- **What documents should be included in a transition to a new COML?**

Handout 10-1: Demobilization Plan (Example)
Handout 10-2: Transition Plan East Zone (Example)
Handout 10-3: Logistics AAR – Castle Rock (Example)

Unit 10: Demobilization and PTB Visual 10-9

Key Points

There is a difference between transition and demobilization, though the majority of the procedures are identical. In a transition, a new team arrives to take the place of the current Communications Unit.

Topic Documentation

Documentation

- All final Communications Unit documentation is the COML's responsibility
 - ICS Form 213, General Message
 - Waybill
 - ICS Form 214, Unit Log
 - Radio Log
 - Lost/damage supplies and equipment
 - Inventory lists
- Evaluating communications staff performance improves the system for the next incident

Unit 10: Demobilization and PTB Visual 10-10

Key Points

The Communications Unit Leader is responsible for the following documentation:

- Incident Radio Communications Plan (ICS Form 205)
- Resource Order Form (ICS Form 308)
- General Message (ICS Form 213)
 - A very versatile form, can be used for tracking resources, releasing frequencies, maintaining contact with local dispatch for the release of aircraft frequencies, and the release of equipment and supplies
 - Although for the final function a Waybill would also be sufficient
- Waybill
 - A type of FedEx form that serves as a manifest for a shipment
 - It is ordinarily the Communications Unit Leader's responsibility to fill this out
- Activity Log (ICS Form 214) must be filled out as well
- Agency-specific forms
 - Used to document all lost or damaged equipment
- Equipment logs
- Transition notes

Topic Documentation (cont'd)

Documentation (cont'd)

- **After Action Report (AAR):**
 - **What was planned?**
 - **What actually happened?**
 - **Why did it happen?**
 - **What can we do next time?**

Unit 10:
Demobilization and PTB

Visual 10-11

Key Points

The Communications Unit Leader is usually required to submit some kind of narrative of their activities throughout the incident at demobilization.

The Communications Unit Leader may choose to expand this narrative by seeking feedback from subordinates and highlighting areas that could be improved on the next incident.

IMT Supplemental Documentation

- **Narrative:**
 - Linear
 - Single-source perspective
 - Completely factual, little analysis or interpretations
- **After Action Report (AAR):**
 - What was planned vs. what happened
 - Collaborative
 - Constructive criticism (What can we do next time?)

Unit 10: Demobilization and PTB Visual 10-12

Key Points

A narrative is an opportunity for the COML or other member of the IMT to provide an account of events from his or her perspective. A narrative is simply a recounting of what happened on the incident and when – it includes little analysis or interpretation.

An after-action report is a collaborative document based on the documentation, IMT members' accounts of events, feedback from subordinate staff, and a thoughtful analysis of how events differed from the plan and why. It includes constructive criticism and is designed to be instructive.

Topic ICS Form 221: Demobilization Checkout

ICS Form 221: Demobilization Checkout

DEMobilIZATION CHECK-OUT (ICS 221)			
1. Incident Name		2. Incident Number	
3. Planned Release Date/Time		4. Release or Personnel Released	
5. Release Location		6. Other Request Number	
7. Release or Personnel <small>Check and sign off on the release of all personnel. Releasees are not released until the checked boxes below are completed. This form is to be completed by the appropriate member and the Demobilization Unit Leader or Training Section Leader.</small>			
LOGISTICS SECTION			
21. Unit/Section	Remarks	Name	Signature
22. Unit/Section			
23. Unit/Section			
24. Unit/Section			
25. Unit/Section			
26. Unit/Section			
FINANCE/ADMINISTRATION SECTION			
31. Unit/Section	Remarks	Name	Signature
32. Unit/Section			
OTHER AGENCY STAFF			
41. Unit/Section	Remarks	Name	Signature
42. Unit/Section			
PLANNING SECTION			
51. Unit/Section	Remarks	Name	Signature
52. Unit/Section			
53. Unit/Section			
8. Remarks			
9. Travel Information:		Route Overlap: <input type="checkbox"/> Yes <input type="checkbox"/> No	
Schedule Time of Departure		Actual Release Date/Time	
Destination		Release Time of Arrival	
Travel Method		Contact Information Other Training	
Vehicle <input type="checkbox"/> Yes <input type="checkbox"/> No		Agency/Department	
10. Release or Personnel		11. Incident Number	
12. Release or Personnel		13. Other Request Number	
14. Release or Personnel		15. Release or Personnel	
16. Release or Personnel		17. Release or Personnel	
18. Release or Personnel		19. Release or Personnel	
20. Release or Personnel		21. Release or Personnel	

Unit 10: Demobilization and PTB Visual 10-13

Key Points

ICS Form 221 can be found in Appendix I.

If the box is checked, the Communications Unit must sign off that all equipment has been returned.

- All personnel who leave the incident go by communications to make sure they don't have any communications equipment checked out to them
- Personnel often must check in with the Communications Unit to attest they have checked in their equipment
- If equipment is given out by the unit, plans need to be made with the Demobilization Unit (if it exists, or coordinated with the Incident Commander) to include an order for all demobilizing personnel to get a sign-off from the Communications Unit on the ICS Form 221

Topic ICS Form 225: Individual Performance Rating

ICS Form 225: Individual Performance Rating

INCIDENT PERSONNEL PERFORMANCE RATING (ICS 225)

(Use this form to evaluate the performance of personnel participating in an incident.)

A. Name		B. Position Title		C. Incident Agency and Address	
Name		Position Title		Incident Agency and Address	
D. Evaluation Period		E. Incident Date		F. Incident Location	
Evaluation Period		Incident Date		Incident Location	
1. Planning	2. Operations	3. Logistics	4. Finance & Administration	5. Safety	6. Public Information
7. Training	8. Incident Management	9. Communications	10. Demobilization	11. Other	12. Overall
13. Total					

Unit 10:
Demobilization and PTB

Visual 10-14

Key Points

ICD Form 225 can be found in Appendix I.

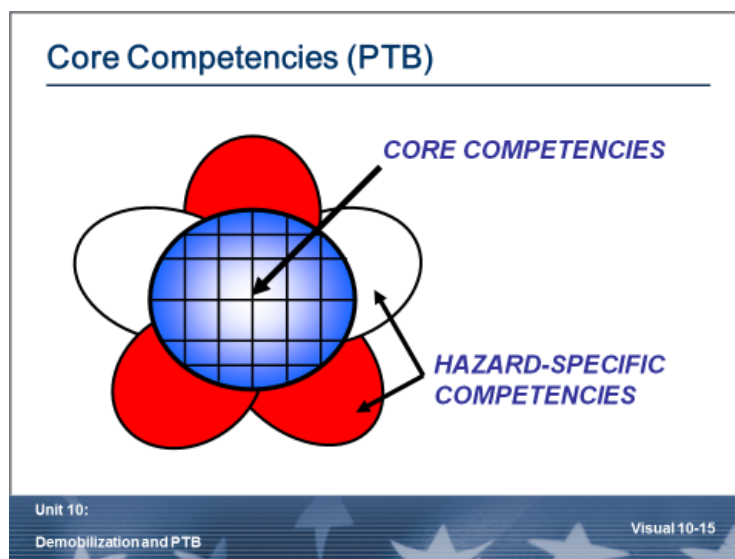
Evaluating communications staff performance improves the system for the next incident.

Be fair and impartial. If you have a stellar performer, see that they are recognized. If you have personnel that are deficient, document that, as well as those steps you took to improve the behavior.

- Monitor individual job performance
- Evaluate and take corrective action as necessary
- Prepare position-specific performance evaluations
- Discuss evaluation with appropriate subordinate

Where does this form go?

Documentation Unit and their home agency, or Planning Section if no Documentation Unit exists.

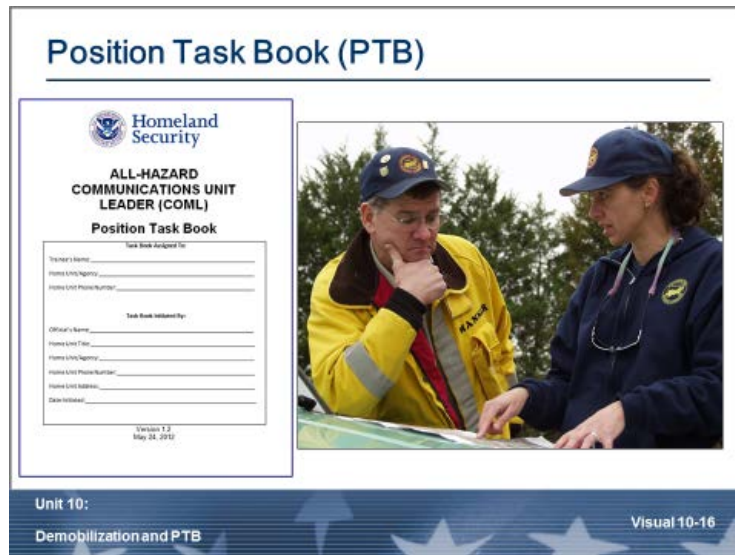
Topic Core Competencies**Key Points**

Competencies: A broad description of that group's core behaviors necessary to perform a specific function. The Flower Diagram:

- The center of the flower represents the core competencies of the position
- The petals represent the hazard-specific competencies associated with specific disciplines
- You cannot be competent as a Communications Unit Leader with the center of the flower or only the petals—the flower needs to be complete to ensure qualification

This course will help to establish core competencies (center of the flower) for the COML position. The hazard-specific competencies will have to be developed through additional agency or discipline training, field training, and the completion of the Communications Unit Leader Position Task Book (PTB).

Topic Position Task Books



Key Points

The PTB is a checklist of tasks that trainees must demonstrate or perform successfully to become certified in the ICS position to which they aspire. A person qualified in that position must observe, evaluate, and sign-off on the trainee's PTB for the trainee to gain certification.

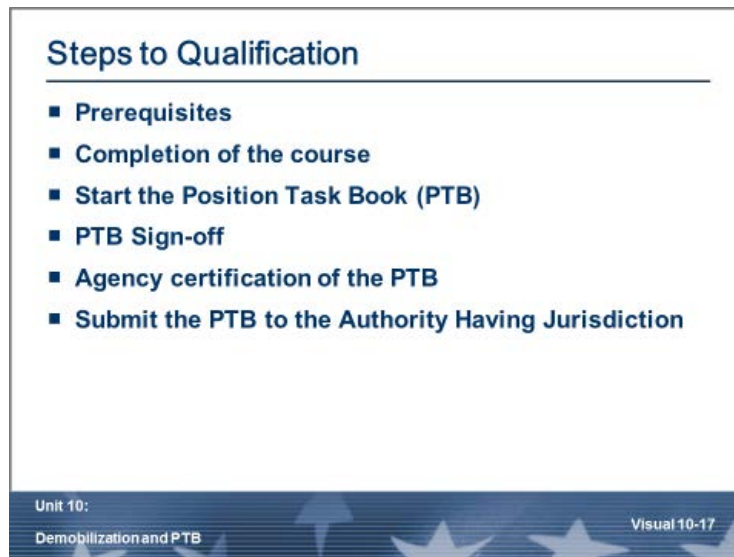
Demonstration of proficiency can be performed: 1) on an incident as a trainee; 2) in a simulation; or 3) in training, depending on the type of task being executed. The code (see the Code column in the PTB) assigned to the task indicates in which of these three areas the task must be demonstrated or performed.

PTBs are organized into a hierarchy of:

- **Competencies:** A broad description that groups core behaviors necessary to perform a specific function.
- **Behaviors:** A general description of an observable activity or action demonstrated by an individual in a particular context
- **Tasks:** A specific description of a unit of work activity that is a logical and necessary action in the performance of a behavior and how the behavior is demonstrated or performed in a particular context; again, these are signed off by qualified evaluators

A given agency/department must individually adopt PTBs as its training standard. PTBs are an integral part of the "performance based" system Federal agencies have adopted for emergency response training. In order to earn a PTB, a trainee must first successfully complete the requisite training courses for that position.

Topic Steps to Qualification

**Key Points**

The course certificate of completion is your “learner’s permit.”

A Communications Unit Leader student has 3 years to complete the Position Task Book (PTB) and can use 3 years of previous experience.

TopicMechanics of the PTB

Mechanics of the PTB

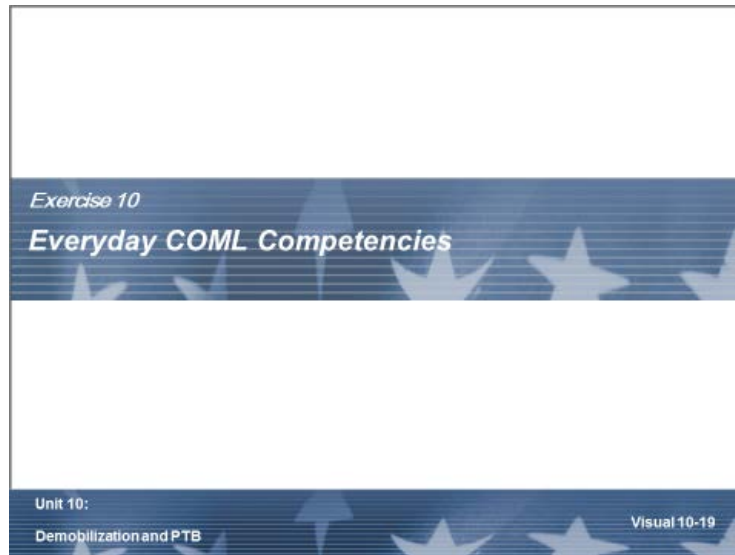
- Who initiates the PTB?
- Who can be an evaluator?
- How long do I have to complete the PTB?
- Can I use previous experience to complete the PTB?
- When the PTB is completed, who signs it off and to whom should I submit it?

Unit 10:
Demobilization and PTB

Visual 10-18

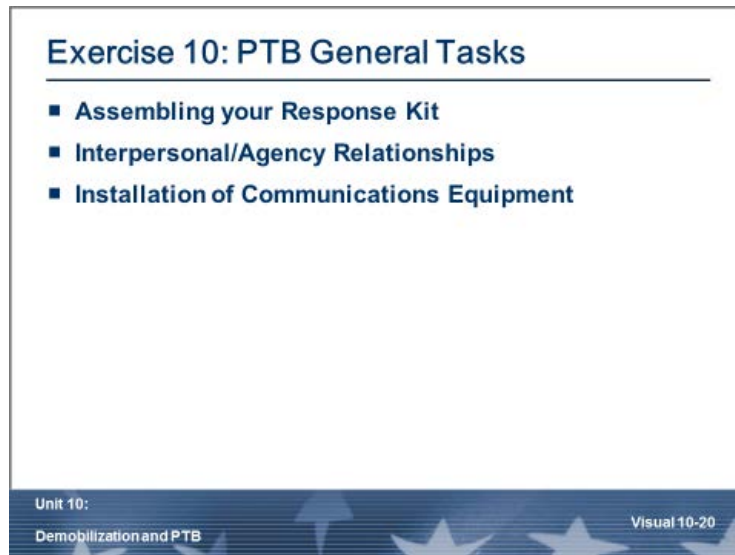
Key Points

TopicExercise 10: Everyday COML Competencies

**Key Points**

This exercise will provide a general understanding of the roles and responsibilities of the COML. It also details the qualification process for the Communications Unit Leader position.

Topic Exercise 10: PTB General Tasks

**Key Points**

Assembling Your Response Kit

Obtain and assemble information and materials needed for a response kit prior to receiving an assignment, including critical items needed for the assignment and items needed for functioning during the first 72 hours.

The following items are suggested as basic information and materials kept in a go bag:

- Pads of paper, pencils, pens and tape
- Food, beverages, and medications to be self-sustaining for 72 hours or more
- Portable radio(s) as appropriate for the region, Hand-held GPS
- Radio programming equipment (cloning cable or computer), adapters, and suitable tools, Gang chargers
- First-aid kit
- 24-hour clock
- Multi-purpose knife
- Access cards or keys to radio facilities and sites within the region
- **State Communications Interoperability Plan (SCIP)**
 - This document is strategic, not tactical
 - It is worth reading, however, so that the Communications Unit Leader has a good understanding of his/her surroundings and the systems in place

- It is a Statewide strategic plan that aligns State, local, and tribal emergency responders to a single vision of future communications interoperability and provides Communications Unit Leaders with the statewide vision for interoperability
- **Tactical Interoperable Communications Plans (TICP):**
 - Communication assets and Standard Operating Procedures for their activation and use on a regional basis
 - TICPs are common to Urban Area Security Initiative (UASI) areas, but may also exist locally
- **Disaster Management Interoperability Services (DMIS)**
 - FEMA-shared, Web-based program for emergency managers that provides forms and information sharing for maintaining situation awareness.
<http://www.fema.gov/about/programs/disastermanagement/>

Topic Objectives Review

Objectives Review

1. *Describe the components for the demobilization plan and procedure involved in demobilization (including steps of anticipating demobilization, equipment procedures and personnel procedures)*
2. *Identify the required documentation submitted during demobilization*
3. *Describe the procedure for a properly conducted AAR*
4. *Discuss the difference in tasks between demobilization and transition*
5. *What is the qualification process for the COML?*
6. *What are the components of the COML Response Kit?*

Unit 10: Demobilization and PTB Visual 10-21

Key Points

Unit Terminal Objective

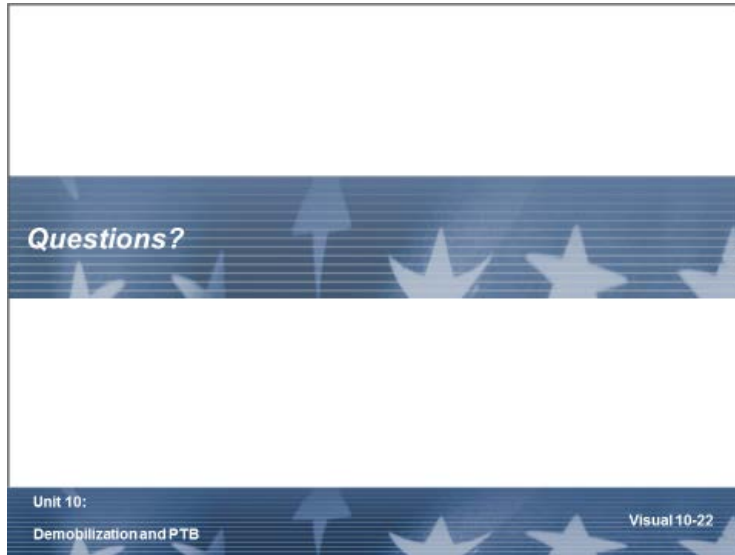
At the end of this unit, students will be able to describe the Communications Unit Leader roles and responsibilities for demobilization/transition from an incident.

Unit Enabling Objectives

- Describe the components for the demobilization plan and procedure involved in demobilization (including steps of anticipating demobilization, equipment procedures and personnel procedures)
- Identify the required documentation submitted during demobilization
- Describe the procedure for a properly conducted AAR
- Discuss the difference in tasks between demobilization and transition
- Describe the qualification process for the COML
- Identify components of the COML Response Kit

Topic

Questions?



Key Points

Unit 11: Final Course Review and Exam

STUDENT GUIDE

Objectives

By the end of this unit, students will have successfully:

- Reviewed the Course Objectives
- Reviewed the Unit Enabling Objectives
- Completed the final exam and exercise
- Completed all necessary documentation

Methodology

This unit incorporates lecture, discussion-based activities, and an exercise.

The purpose of the Final Exercise is for students to synthesize and apply all of the information they have learned so far in the course in a hands-on setting.

The purpose of the Final Exam is for the students to demonstrate the understanding of the course and unit enabling objectives.

Time Plan

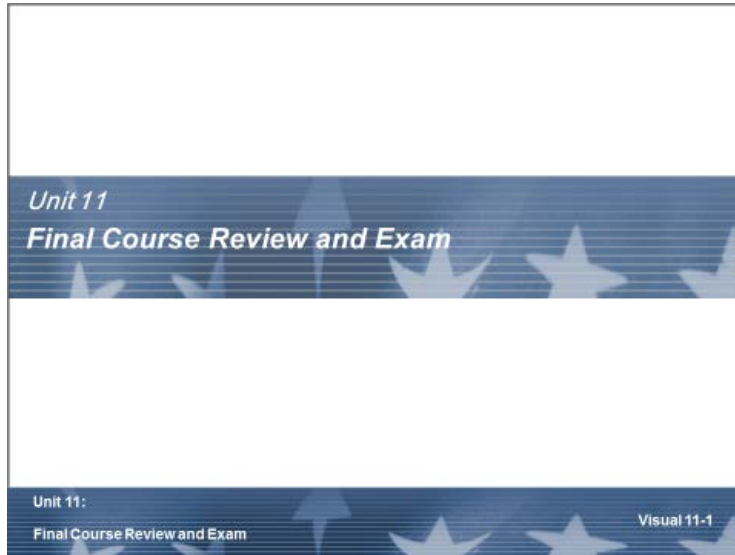
A suggested time plan for this unit is shown below. More or less time may be required, based on the experience level of the group.

Topic	Time
Lesson	30 minutes
Final Exercise	1 hour
Final Exam	1 hour
Total Time	2 hours, 30 minutes

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Topic

Unit Title Slide



Key Points

Topic Course Objectives Review

Course Objectives Review

Has the All-Hazard COML course met the following course objectives?

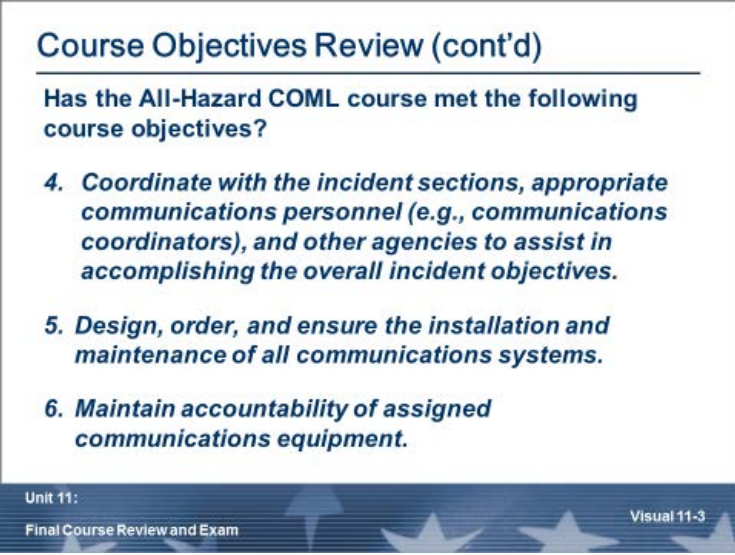
- 1. Identify the functions of the Communications Unit and the duties and responsibilities of the COML.*
- 2. Arrive at an all-hazards incident properly equipped, gather information to assess the assignment, and begin initial planning activities of a COML.*
- 3. Plan, staff, manage, and demobilize the Communications Unit in a safe and effective manner to meet the needs of the incident.*

Unit 11: Final Course Review and Exam Visual 11-2

Key Points

Course Objectives

- Identify the functions, duties, and responsibilities of the Communications Unit Leader
- Arrive at an all-hazards incident properly equipped, gather information to assess the assignment, and begin initial planning activities of a Communications Unit Leader
- Plan, staff, manage, and demobilize the Communications Unit in a safe and effective manner to meet the needs of the incident

Topic Course Objectives Review (cont'd)

Course Objectives Review (cont'd)

Has the All-Hazard COML course met the following course objectives?

- 4. Coordinate with the incident sections, appropriate communications personnel (e.g., communications coordinators), and other agencies to assist in accomplishing the overall incident objectives.*
- 5. Design, order, and ensure the installation and maintenance of all communications systems.*
- 6. Maintain accountability of assigned communications equipment.*

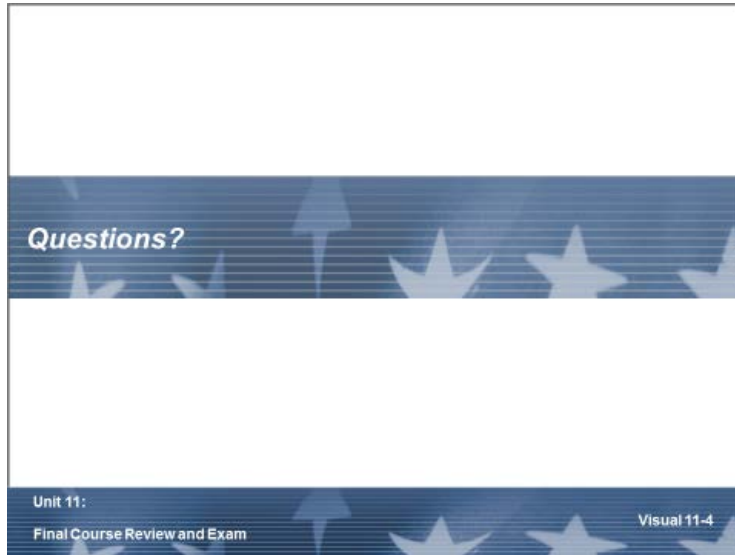
Unit 11: Final Course Review and Exam Visual 11-3

Key Points**Course Objectives**

- Coordinate with the incident sections, appropriate communications personnel (e.g., communications coordinators), and other agencies to assist in accomplishing the overall incident objectives
- Design, order, and ensure the installation and maintenance of all communications systems
- Maintain accountability of assigned communications equipment

Topic

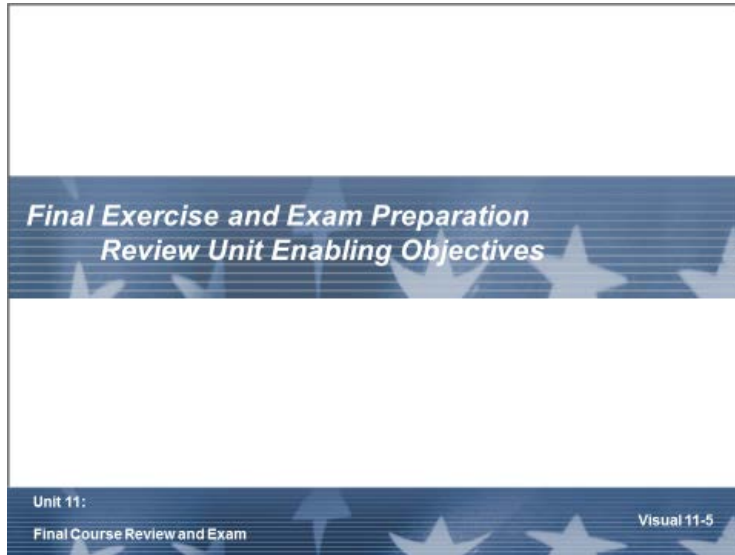
Questions?



Key Points

Topic

Final Exercise & Exam Preparation



Key Points

Topic

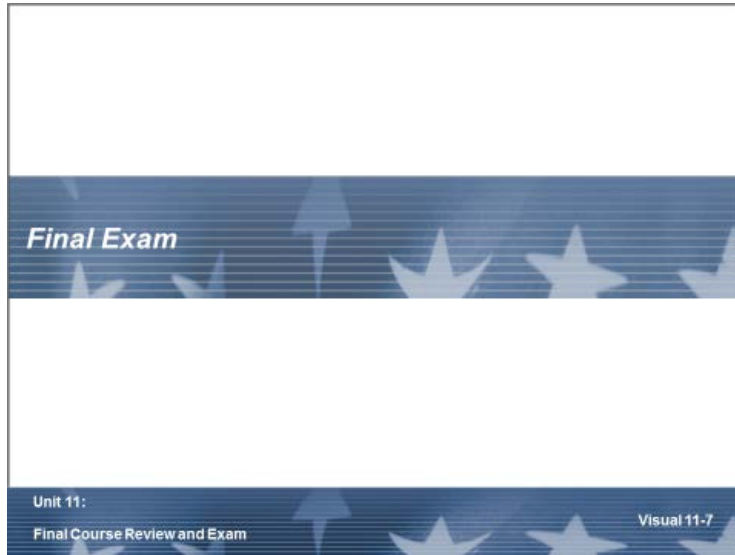
Final Exercise



Key Points

Topic

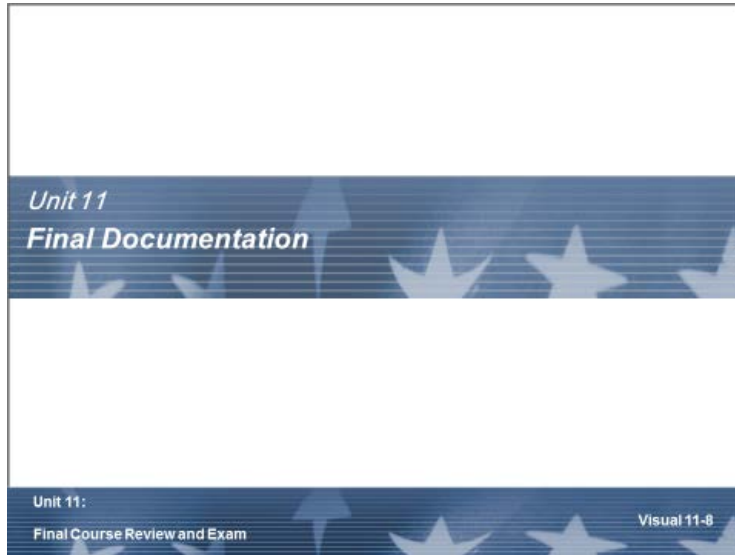
Final Exam



Key Points

Topic

Final Documentation



Key Points
