# G251 Student Manual

# Workshop in Emergency Management: AMATEUR RADIO RESOURCES



EMERGENCY MANAGEMENT INSTITUTE

FEMA

FEDERAL EMERGENCY MANAGEMENT AGENCY
EMERGENCY MANAGEMENT INSTITUTE
JUNE 2013

Photo Credit:
Biloxi, Miss., July 23, 2009 --Darrin Ivey, emergency management team lead for Biloxi Regional Hospital, demonstrates how to use a ham radio. The hospital acquired the radios after Hurricane Katrina to improve communications for future storms. Jennifer Smits/FEMA.

| **Location:** | Biloxi, Mississippi | **Photographer:** | Jennifer Smits |
|---|---|---|---|
| **Photo Date:** | 07/23/2009 | | |
| **Original filename:** | MS_1604_biloxi regional preparedness_0081.jpg | | |
| **Size:** | 798.9 KB | **Dimensions:** | 3872x2592 |
| **Disasters:** | Mississippi Hurricane Katrina (DR-1604) | | |

# Table of Contents

# Acknowledgements

The preparation of this course was made possible through the assistance and cooperation of individuals from the Amateur Radio Community.  The Emergency Management Institute (EMI) wishes to thank the following individuals for their roles in the development of the training materials.

## Overview of Topics and Activities

| Topic / Activity | Estimated Time |
|---|---|
| **Workshop Overview** | 10 minutes |
| **Topic 1:** Why Your Plan Should Include Amateur Radio Resources | 40 minutes |
| Case Study: Columbia County, Part 1 | 20 minutes |
| **Topic 2:** How Amateur Radio Groups Can Help During Emergencies | 60 minutes |
| Case Study: Columbia County, Part 2 | 20 minutes |
| **Topic 3:** What Amateur Radio Resources Can Do | 60 minutes |
| Case Study: Columbia County, Part 3 | 20 minutes |
| *Option: Equipment Demonstration* | *up to 25 minutes* |
| *Option: GIS Demonstration* | *up to 25 minutes* |
| **Topic 4:** How to Achieve a Successful Races Organization | 45 minutes |
| Case Study: Columbia County, Part 4 | 30 minutes |
| Brainstorming Activity | 15 minutes |
| *Option: RACES Handouts* | *5 minutes* |
| **Topic 5:** What You Can Do in Your Community | 5 minutes |
| Case Study: Columbia County, Part 5 | 15 minutes |
| Action Item List | 15 minutes |
| **Workshop Summary** | 5 minutes |
| **Total Estimated Time** | 6-7 hours (not including breaks) |

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# Instructor Guide

| Slides | Content |
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## Workshop Overview

**Visual 1**



G251
Workshop in Emergency
Management
Amateur Radio
Resources

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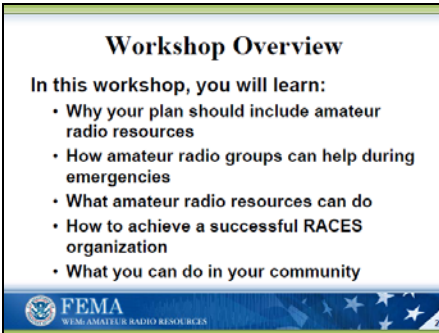WEM: AMATEUR RADIO RESOURCES
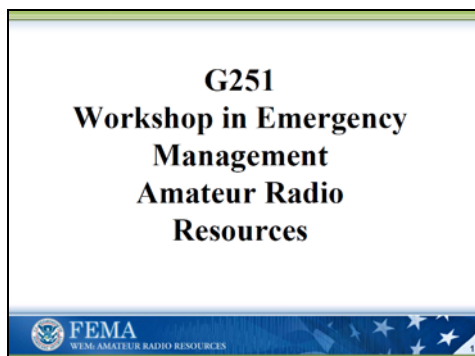
- Emergency exits and procedures
- Location of restrooms
- Procedures for breaks
- Use of the "parking lot" for questions.

**NOTES:**

| Slides | Content |
|---|---|

**Visual 2**



This workshop is about using amateur radio, or "ham" radio, as a resource for emergency communications. Ham radio operators are licensed and highly capable; they are called amateurs simply because they don't get paid for their services.

In addition to using ham radio as a hobby, many amateur radio operators eagerly volunteer their time and equipment during emergencies to provide valuable communications when other, more traditional, means of communicating fail.

Upon completion of the workshop, participants should be able to:

- Explain the importance of amateur radio for emergency communications.
- Describe the amateur radio groups that can provide emergency communications.
- Explain the capabilities of amateur radio resources.
- Explain how to achieve a successful RACES/ACS organization.
- Determine a strategy for coordinating with amateur radio resources in the community.

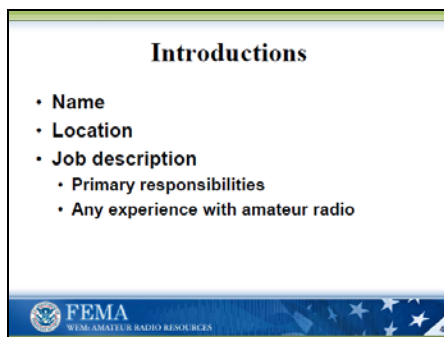| Slides | Content |
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**Visual 3**
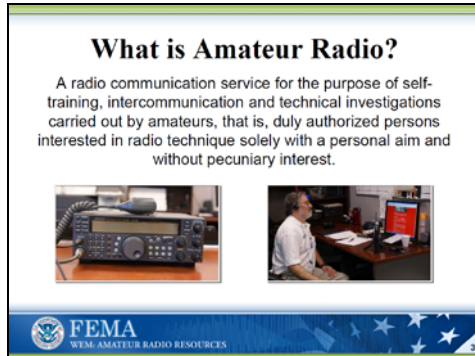


**Definition of Amateur Radio**

*Begin by ensuring that participants understand what amateur radio is. The definition on the slide is from Title 47 CFR Section 97.*

Amateur radio includes licensed amateur radio operators and stations providing amateur service. The amateur service is made up of more than 600,000 U.S. radio operators licensed by the Federal Communications Commission (FCC).

Amateur Radio Operators are often referred to as "Ham" radio operators. Ham radio operators are often able to get information that emergency responders do not have time to obtain, accurately and quickly. They provide information for the decision-making process and help to determine needed resources.
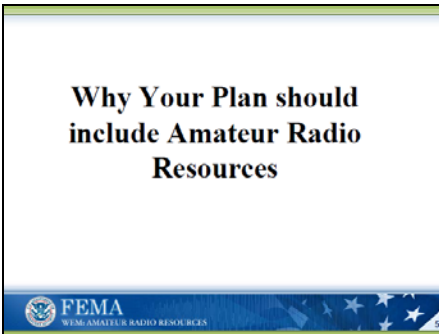
**Visual 4**



**Introductions**

**NOTES:**

| Slides | Content |
|--------|---------|

**Visual 5**



# Topic 1: Why Your Plan Should Include Amateur Radio Resources

If you're not familiar with the capabilities of amateur radio, the first question you may ask when considering the use of ham volunteers in emergency operations is "why?"

This section will give you an overview of the reasons that emergency management agencies across the country are including amateur radio resources in their disaster planning efforts.

**Visual 6**
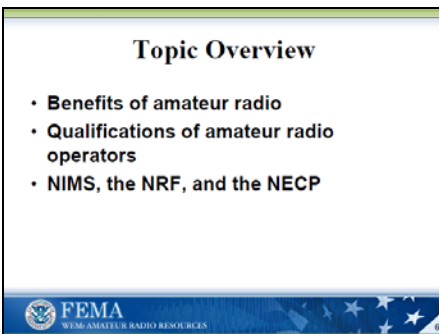


## Topic Overview

In this part of the workshop, you will learn what amateur radio is and some basic information about how it can be used during emergencies.

When you finish this topic, you should be able to:

- Describe the benefits of amateur radio.

- Describe the different classes of Amateur licenses that may be held by amateur radio operators.

- Explain how the National Response Framework (NRF), the National Incident Management System (NIMS), and the National Emergency Communications Plan (NECP) relate to the use of amateur radio in emergencies.

| Slides | Content |
|---|---|

**Visual 7**
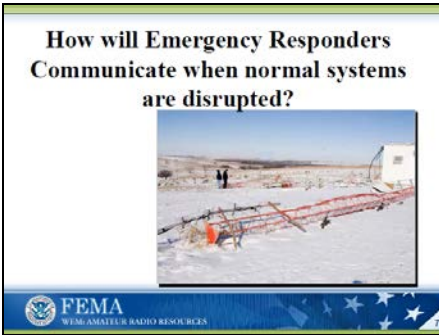


### Benefits of Amateur Radio

During an emergency, normal communications may not be operational.  For example, this communications tower is one of several that were knocked down during the 2007 winter storms in Kansas.  Being able to communicate quickly and effectively is vital for emergency response personnel.
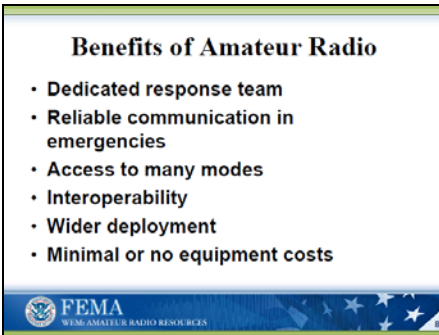
Amateur radio operators can provide:

- A dedicated team to respond in case of emergency.
    - "Eyes and ears" on the ground when and where they are needed (e.g., tornado spotters).
    - Additional information for the EOC, relayed from the scene (e.g., damage assessment).
- A form of communication that is virtually impervious to disasters.
- Emergency communications over different modes.

| **Slides** | **Content** |
|---|---|

**Visual 8**



- Some degree of interoperability, because an amateur radio operator providing communications for one response agency can communicate with another amateur radio operator providing communications for another agency.

  o This interoperability is enabled if the amateurs are communicating using authorized amateur radio service frequencies, since they are then authorized to use the same frequencies.

  o Interoperability is one of the greatest obstacles to post-disaster communications, since local and mutual aid response agencies have radio equipment that generally lacks capability to operate on the frequencies of other responders.

- Quick response to and communications from disaster sites in their immediate areas.

- Their own equipment, usually.

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**Visual 9**
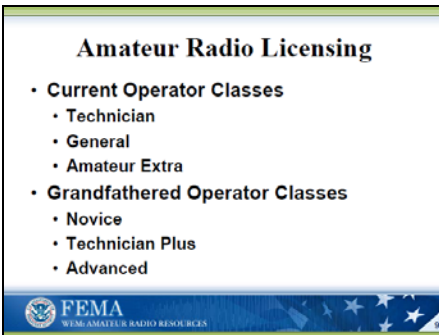


## Amateur Radio Licensing

Amateur radio operators are qualified, capable people who have received their licenses from the FCC by passing stringent examinations that demonstrate their knowledge of communications theory and practice. The results of the exam determine the operator class of the license. Each class has different privileges associated with it.

**Current Operator Classes:**

- The Technician Class operator license is for beginners. These operators are authorized to transmit on channels in any of the frequency bands above 50 MHz with up to 1,500 watts of power. Technician Class licensees also have privileges in four amateur service bands in the HF range (3-30 MHz).

  o To obtain the Technician Class operator license, applicants must pass a 35-question written examination that covers basic regulations, operating practices, and electronics theory.

- The General Class operator license authorizes privileges in all amateur service bands with high power. The ability to operate on HF bands with high power enables these operators to communicate across the country and even around the world.

  o To qualify for a General Class operator license, the operator must pass the Technician Class written exam as well as another 35-question written examination that covers intermediate regulations, operating practices, and electronics theory.

- Amateur Extra Class operator license holders are authorized to operate on all frequencies allocated to the Amateur Service.

  o To qualify for the Amateur Extra Class operator license, applicants must pass the above two exams as well as a 50-question written examination that covers more obscure regulations, specialized operating practices, advanced electronics theory, and radio equipment design.

| Slides | Content |
|--------|---------|
|  | **Grandfathered Classes** |

The grandfathered licenses may be modified or renewed, but new amateur radio operators are not assigned to these operator classes.

- The Novice Class operator license is for persons who have passed the 5 wpm telegraphy examination, but only the first part of the written examination formerly required for the Technician Class. Privileges include four bands in the HF range, one band in the VHF range (30-300 MHz), and one band in the UHF range (300-3,000 MHz).

- The Technician Plus Class operator license was issued to Technician Class licensees, who, in addition to passing a written examination, also had passed at least a 5 wpm telegraphy examination. A Technician Plus Class licensee is authorized the privileges of a Technician Class licensee plus the privileges of a Novice Class licensee.

- The privileges of an Advanced Class operator license include 275 kHz of additional spectrum in the HF bands.

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**Visual 10**
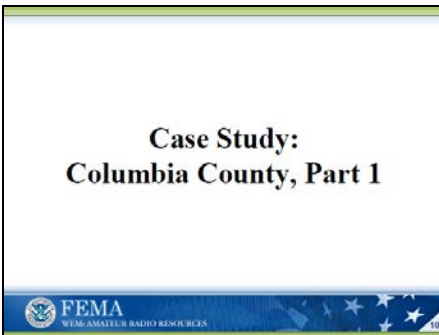


**Case Study: Columbia County, Part 1**

- ***What assumptions are made by emergency management personnel about amateur radio operators?***

    *Responses may include:*

    o   They are untrained and incapable.
    o   They are unmotivated (can't get their programs off the ground).
    o   They can't be trusted when real lives are at stake.

- ***The emergency managers confuse amateur radio with CB radio.  What are the differences?***

Citizens Band radio can also be used for some emergency communications and is governed by CFR Title 47 Section 95 Subpart D, Citizens Band (CB) Radio Service. For more information, participants can go to the website for the Radio Emergency Associated Communications Team (REACT), listed in Appendix C.
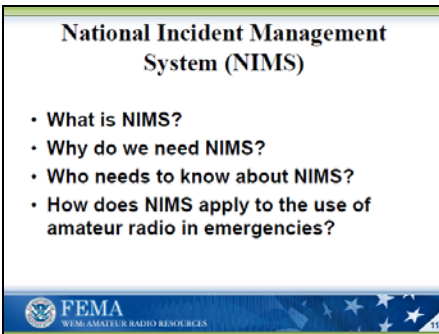
- ***If it's true that hams were reporting tornadoes that weren't there, how could that situation be prevented?***

**NOTES:**

| Slides | Content |
|---|---|

**Visual 11**



# NIMS, the NRF, and the NECP

*The purpose of this section is to provide a <u>brief</u> overview of NIMS, the NRF, and the NECP to show how they relate to the use of amateur radio in emergencies.*

**National Incident Management System**

- What is NIMS?

  o NIMS is a comprehensive, national approach to incident management that is applicable at all jurisdictional levels and across functional disciplines. It is intended to:

  o Be applicable across a full spectrum of potential incidents, hazards, and impacts, regardless of size, location, or complexity.

  o Improve coordination and cooperation between public and private entities in a variety of incident management activities.

  o Provide a common standard for overall incident management.

- Why do we need NIMS?

  o NIMS provides a consistent nationwide framework and approach to enable government at all levels (Federal, State, tribal, and local), the private sector, and nongovernmental organizations (NGOs), to work together to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents regardless of the incident's cause, size, location, or complexity.

- Who needs to know about NIMS?

  o NIMS is applicable to State, tribal and local governments, private sector organizations, critical infrastructure owners and operators, NGOs, and other organizations with an active role in emergency management and incident response. Elected and appointed officials, who are responsible for jurisdictional policy decisions, must also have a clear understanding of their emergency management roles.

| Slides | Content |
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- How does NIMS apply to amateur radio operators?

  NIMS provides the framework to enhance the ability of responders, including the private sector and NGOs, to work together more effectively. Amateur radio operators facilitate good communication and interoperability.

  - Training and more information about NIMS are available online at http://www.fema.gov/emergency/nims/. This Web site is included in the list of resources provided in the Student Manual.

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**Visual 12**
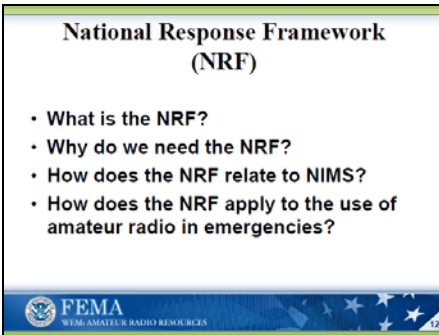


**The National Response Framework**

- What is the NRF?

  The *National Response Framework* (NRF) is a guide that details how the Nation conducts all-hazards response, from the smallest incident to the largest catastrophe. The Framework establishes a comprehensive, national, all-hazards approach to domestic incident response.

- Why do we need the NRF?

  The purpose of the NRF is to ensure that government executives, private-sector and nongovernmental organization (NGO) leaders, and emergency management practitioners across the nation understand the domestic incident response roles, responsibilities, and relationships in order to respond more effectively to any type of incident.

- Who needs to know about the NRF?

  The NRF is written especially for government executives, private-sector and nongovernmental organization (NGO) leaders, and emergency management practitioners.

- How does the NRF relate to NIMS?

  The NIMS and the NRF are companion documents, and are designed to improve the Nation's incident management and response capabilities. While NIMS provides the template for the management of incidents regardless of size, scope, or cause, the NRF provides the structure and mechanisms for national level policy of incident response. Together, the NIMS and the NRF integrate the capabilities and resources of various governmental jurisdictions, incident management and emergency response disciplines, non-governmental organizations, and the private-sector into a cohesive, coordinated, and seamless national framework for domestic incident response.

| Slides | Content |
|---|---|
| | • How does the NRF apply to amateur radio operators? |
| | The NRF describes the process for how the private sector interfaces with other response organizations during an incident, and better articulates the private sector's relationships with other response entities. The section titled "Emergency Support Function (ESF) #2" provides communications support to Federal, State, tribal, and local governments and first responders when their systems have been impacted during emergencies. |
| | Electronic copies of the NRF are available online at www.fema.gov/NRF. |

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**Visual 13**
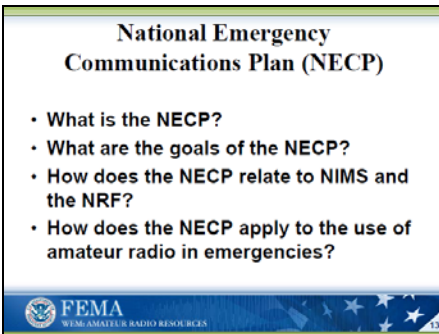


**The National Emergency Communications Plan**

- What is the NECP?

  The NECP is a strategic plan that sets goals and identifies key national priorities to enhance governance, planning, technology, training and exercises, and disaster communications capabilities. The NECP provides recommendations, including milestones, to help emergency response providers and relevant government officials make measurable improvements in emergency communications over a three-year period, beginning with 2010.

- What are the goals of the NECP?

  Goal 1: By 2010, 90 percent of all high-risk Urban Areas designated within the Urban Area Security Initiative (UASI) are able to demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.

  Goal 2: By 2011, 75 percent of non-UASI jurisdictions are able to demonstrate response-level emergency communications within one hour for routine events involving multiple jurisdictions and agencies.

  Goal 3: By 2013, 75 percent of all jurisdictions are able to demonstrate response-level emergency communications within three hours of a significant event as outlined in national planning scenarios.

  *NOTE: "Response-level emergency communications" is the capacity of individuals with primary operational leadership responsibility to manage resources and make timely decisions during a multi-agency incident without technical or procedural communications impediments.*

| Slides | Content |
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| | • How does the NECP relate to NIMS and the NRF? |
| | The NECP was developed to be consistent with overarching Homeland Security preparedness and response doctrine. This includes the National Incident Management System (NIMS) and the National Response Framework (NRF). The NECP establishes goals, objectives, and initiatives for interoperable and operable emergency communications that will support incident management. This includes objectives and initiatives that focus on improving governance structures and standard operating procedures to bolster response operations. In addition, the NECP contains initiatives and milestones that seek to accelerate the implementation of emergency communications components in the NRF by public safety agencies across the Nation. |
| | • How does the NECP apply to amateur radio operators? |
| | The vision of the NECP is to ensure emergency response personnel at all levels of government and across all disciplines, can communicate as needed, on demand, and as authorized, through improvements in communications operability, interoperability, and continuity nationwide. Amateur radio operators are vital to the accomplishment of this vision, by being actively involved in the emergency management activities of their communities. |

| Slides | Content |
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**Visual 14**
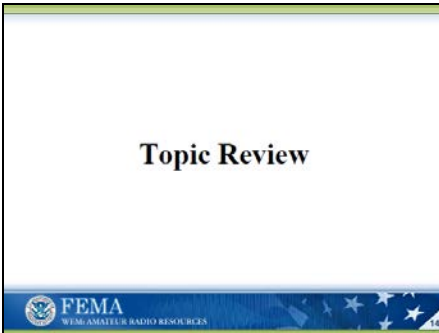


**Topic Review**

Amateur radio is widely used in the United States. There are more than 600,000 operators licensed by the FCC.  Amateur radio operators, working through RACES or ARES and operating under the auspices of a State or local emergency management agency, can provide critical communications links during an emergency.

- *What benefits can amateur radio operators provide for a community during emergencies?*

- *Which operator class allows amateur radio operators to operate on all frequencies allocated to the Amateur Service?*

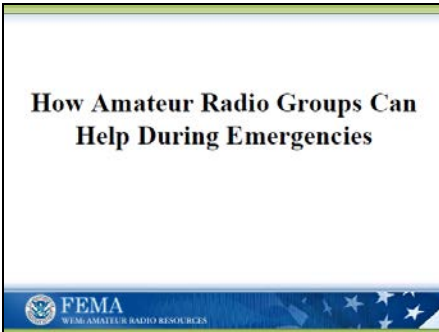- *How do the NRF, NIMS, and NEMC relate to the use of amateur radio operators in emergencies?*

**NOTES:**

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**Topic 2: How Amateur Radio Groups Can Help During Emergencies**

**Visual 15**



**Visual 16**
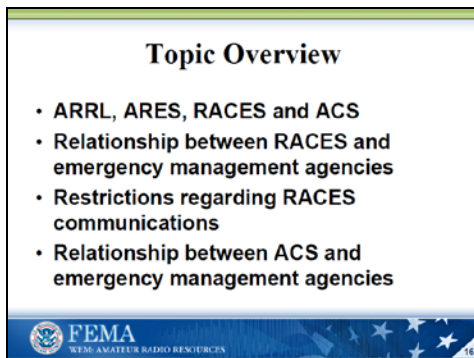
**Topic Overview**



In emergencies, communications are often the weak link in the management chain.  In this part of the workshop, you will learn more about how amateur radio resources can help ensure reliable communications during emergencies.

When you finish this topic, you should be able to:

- Distinguish among the American Radio Relay League (ARRL), the Radio Amateur Civil Emergency Service (RACES), and the Amateur Radio Emergency Services (ARES) and the Auxiliary Communications Service (ACS) .

- Describe the relationship between RACES and emergency management agencies.

- Summarize the restrictions regarding civil defense communications that RACES is authorized to transmit.

| Slides | Content |
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**Visual 17**



## Amateur Radio Groups

There are many organizations to which amateur radio operators may belong. The groups listed are the three main amateur radio groups.

- ARRL

  The American Radio Relay League (ARRL) is the national membership association for amateur radio operators. It can be helpful in locating local chapters and discovering the amateur radio operators in your community.

- ARES

  ARES was developed by ARRL in 1935 as an organization dedicated to public-service and emergency communication. Today, this organization is made up of more than 25,000 amateurs nationwide who have voluntarily registered their services. They are organized into a well-trained network of operators capable of providing reliable primary or secondary communications links for governmental agencies and/or nonprofit organizations when needed.

  ARES is one of two established amateur radio resources that can provide emergency communications. The other is Radio Amateur Civil Emergency Service (RACES).

**Visual 18**



- RACES

  RACES is administered by the Federal Emergency Management Agency (FEMA) of the U.S. Government. It is a part of the amateur radio service that provides radio communications support during periods of local, regional, or national emergencies. RACES operates under the supervision of the appropriate State or local emergency management agency.

| Slides | Content |
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| **Visual 18**<br>**(continued)**<br><br> | RACES organizations can be formed by State and local emergency management agencies. Because these are primarily locally based organizations there are no firm estimates on the number of volunteers participating nationwide. In RACES, amateur radio operators are affiliated with a State or local emergency management agency and amateur stations are registered with the agency (or the agency has a FCC-licensed RACES station). RACES is usually structured so that an individual RACES organization is managed by a State or local emergency management director or coordinator, with assistance from a RACES Officer. The emergency management agency trains, tests, and includes RACES members in exercises.<br><br>Auxiliary Communications Services (ACS) Program provides for government use of emergency communications specialists from the other organizations. Additionally, the program provides the Emergency Management Agency (EMA) with a primary redundant emergency communications unit that also serves to set an example of how the unit can serve government. ACS members provide emergency communications support through a diverse group of organizations: RACES, ARES, MARS, local clubs, and the NWS SKYWARN program. Others who are not licensed Amateur Radio operators also provide emergency communications support through organizations such as REACT, the Civil Air Patrol, the US Coast Guard Auxiliary, and others.<br><br>Be sure to check for local clubs in your area that may or may not be affiliated with the groups listed above. |

| Slides | Content |
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Another amateur radio group is the Military Affiliate Radio System (MARS):

> Managed by the Army, Air Force, and Navy, the MARS program uses amateur radio operators primarily to help maintain communications between military personnel and their family members. MARS was once very active, but it has declined in activity with the increased availability of telephone service worldwide. For areas with a heavy Naval presence, MARS may still provide supportive resources for certain emergency situations.

**Visual 19**
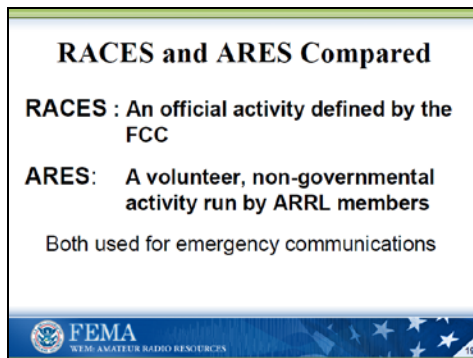


**RACES and ARES Compared**

It is important to understand that although RACES and ARES are separate entities, the amateur radio community advocates dual membership and cooperative efforts between the groups whenever possible. The RACES regulations now make it simple and possible for an ARES group whose members are all enrolled in and certified by RACES to operate in an emergency with great flexibility. Using the same operators and the same frequencies, an ARES group also enrolled as RACES can "switch hats" from ARES to RACES and RACES to ARES to meet the requirements of any situation as it develops.

> The various amateur radio resources, in addition to their principal purpose as defined in the FCC regulations, have their distinct features, purposes, and capabilities. State and local emergency management agencies should become knowledgeable about the various resources, understand the different kinds of communications that they can be authorized to provide, and if desired, develop plans to use these resources.

| Slides | Content |
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**Visual 20**
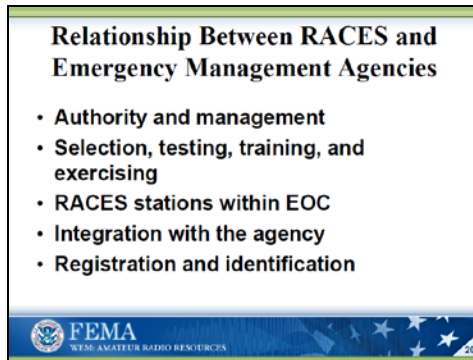


## Relationship Between RACES and Emergency Management Agencies

RACES and ARES are both valuable resources to emergency management agencies.  A well-managed amateur radio organization can provide communications that will improve an agency's response during an emergency, especially in the immediate hours following a disaster.

For many communities, the restrictions on RACES organizations are too limiting to use only RACES groups in emergency management.  These communities usually work with both RACES and ARES groups.  For the purposes of this workshop, we'll focus on the relationship between RACES and the emergency management agency.

Even for emergency management agencies with excellent existing communications, under the worst disaster conditions, when other communications have been disabled or communications traffic is too great, RACES can prove beneficial. RACES is the structure that emergency managers can use to benefit from amateur radio resources.

A RACES organization operates under the direction of its emergency management agency. Typically, the relationship between the two includes the following factors:

- The emergency management agency maintains the authority and management of the RACES organization, and any communications provided by RACES must be authorized by the agency. Selection, testing, training, and exercising of RACES volunteers are under the direct control of the emergency management agency.

RACES members can become an integral part of a State or local emergency management agency. This can contribute to a better understanding by RACES members of the emergency management agency's operating procedures, familiarity with personnel, and improved interaction.

| Slides | Content |
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| | • An EOC often has a RACES station and a RACES operator. RACES can provide links between EOCs that have RACES operators and stations. |
| | • RACES members, as registrants with an emergency management agency, are normally issued agency identification cards. This facilitates access by RACES volunteers to an EOC's communications center or a restricted staging area at a disaster scene. |

**Visual 21**
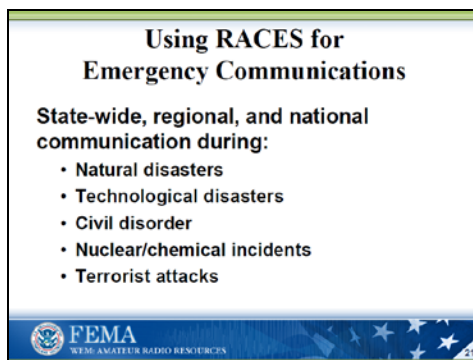


**Using RACES for Emergency Communications**

Whether operating as RACES members or ARES members, amateur radio operators are required to follow various rules and regulations regarding the types of emergency communications that they are authorized to transmit. Although ARES members are required to follow FCC regulations, they are not bound by the requirements in Title 47 CFR § 97.407. These regulations are specifically for RACES.

The following are examples of emergency communications that may be provided by amateur radio resources, depending upon the resource, authorizations, and existing conditions.

• Communications for safety of life and protection of property

Example: In Lincoln, Nebraska, the Local Emergency Operations Plan calls for an amateur to be assigned to the admissions area of each local hospital, as well at the triage/transport area of any disaster scene. This keeps each hospital informed of the number of patients and types of injuries to be expected, even if there is a total breakdown of the primary communications system.

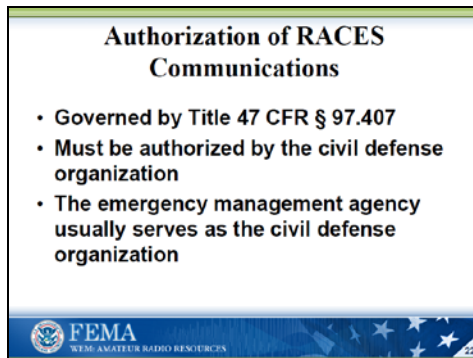| Slides | Content |
|--------|---------|
|  | • Communications for direction, control, and warning for State and local emergency management agencies |
|  | Example: A disaster scene may be many miles removed from a State EOC. Normal VHF/UHF channels may not cover the distances involved. Since normal telephone service is almost always destroyed or overloaded in a disaster, high frequency, long-haul communications links may provide the only communications available until normal communications can be restored. |
|  | • Back-up and supplemental emergency communications |
|  | Example: Communications for police, fire, and rescue can be provided when their communications systems have been disabled or overwhelmed by a disaster. Almost all local communication among primary operating response forces takes place through repeaters. This includes even the latest 800 megahertz trunked systems. Any system utilizing repeaters on towers at remote locations is particularly vulnerable to a wide variety of outages. When these outages occur, hams can supplement local communications (often with temporary portable repeaters) until normal communications can be restored. |
|  | • Emergency communications for disaster relief |
|  | Example: In the immediate aftermath of disaster, people from all over the country are concerned about the safety of their friends and loved ones. When telephone links are destroyed or overloaded, hams work with the American Red Cross to forward messages from the disaster area to relatives in the outside world. Also, when Red Cross shelters are opened, hams often provide the needed communications links between them. |

| Slides | Content |
|---|---|
| | • Communications in support of ongoing Government programs |

Example: In many communities around the country, hams are dispatched by the National Weather Service to spotters' points in the area. From high locations with good fields of view, they keep in radio contact with the National Weather Service/emergency management personnel so that if severe weather does develop, warning systems can be sounded immediately. The added minutes or even seconds of early warning time they provide has unquestionably saved many lives.

**Visual 22**



**Authorization of RACES Communications**

- Governed by Title 47 CFR § 97.407
- Must be authorized by the civil defense organization
- The emergency management agency usually serves as the civil defense organization

## RACES Restrictions

Keep in mind that the term "civil defense" refers to all types of disasters (i.e., natural, manmade, and technological). Emergency management agencies frequently serve as the civil defense organization in a State or locality.

Title 47 CFR § 97.407 addresses requirements for radio amateur civil emergency service. According to Title 47 CFR § 97.407 (e), all communications transmitted in RACES must be specifically authorized by the civil defense organization for the area served.

47 CFR 97 is included in Appendix B.

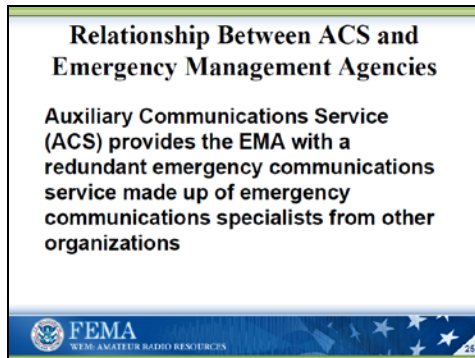| **Slides** | **Content** |
|---|---|

**Visual 23**
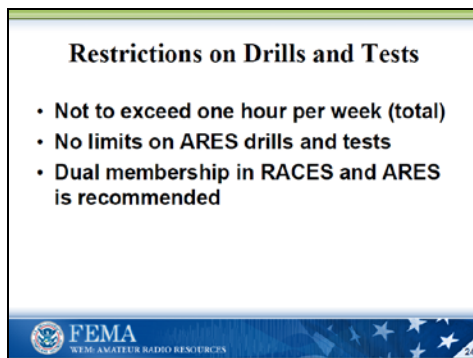


The following information, extracted from the CFR, outlines the types of civil defense communications that RACES is authorized to transmit.

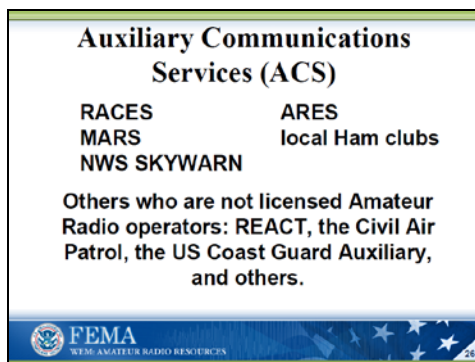Only civil defense communications of the following types may be transmitted:

- (1) Messages concerning impending or actual conditions jeopardizing the public safety, or affecting the national defense or security during periods of local, regional, or national civil emergencies;

- (2) Messages directly concerning the immediate safety of life of individuals, the immediate protection of property, maintenance of law and order, alleviation of human suffering and need, and the combating of armed attack or sabotage;

- (3) Messages directly concerning the accumulation and dissemination of public information or instructions to the civilian population essential to the activities of the civil defense organization or other authorized governmental or relief agencies; and

**Visual 24**



- (4) Communications for RACES training drills and tests necessary to ensure the establishment and maintenance of orderly and efficient operation of the RACES as ordered by the responsible civil defense organization served. Such drills and tests may not exceed a total time of 1 hour per week. With the approval of the chief officer for emergency planning in the applicable State, Commonwealth, District or territory, however, such tests and drills may be conducted for a period not to exceed 72 hours no more than twice in any calendar year.

| Slides | Content |
|---|---|

**Visual 25**



**Relationship Between ACS and Emergency Management Agencies**

Auxiliary Communications Service (ACS) provides the EMA with a redundant emergency communications service made up of emergency communications specialists from other organizations

The ACS program is based on and includes the RACES, but broadens the scope to include the use of non-amateur radio volunteers and beyond only utilizing them during emergencies. National Priorities emphasize the need to coordinate resources regionally. The ACS Program will provide the mechanism to target the coordination of these particular disaster response organizations and their resources on a statewide basis.
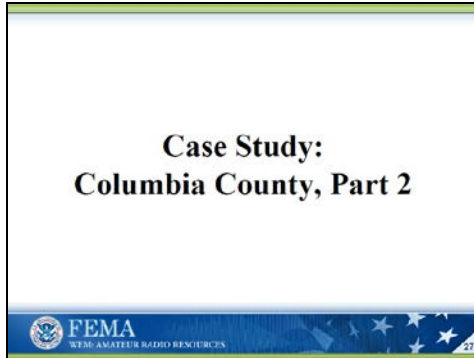
**Visual 26**



**Auxiliary Communications Services (ACS)**

RACES               ARES
MARS                local Ham clubs
NWS SKYWARN

Others who are not licensed Amateur Radio operators: REACT, the Civil Air Patrol, the US Coast Guard Auxiliary, and others.

The ACS is an umbrella program that includes other organizations and groups for coordination and planning purposes. Moving to an ACS model will formalize the ongoing attempts at removing the barriers that have existed, in some areas, between RACES and ARES and other amateur radio groups. Another important element in the ACS model is removing of the false concept that a volunteer communications reserve is one in which ONLY Amateur Radio Service resources and frequencies are utilized in support of government communications. While many programs will continue to rely heavily upon Amateur Radio Service resources, those programs that embrace the ACS model will find it much easier to include and incorporate other communications volunteers and resources.

These volunteers come from a variety of backgrounds including radio, information technology, telephone, microwave, satellite, medicine, law and other professional backgrounds. Personnel may or may not hold FCC licenses; yet the majority are usually Amateur Radio licensees from a variety of volunteer emergency communications units.
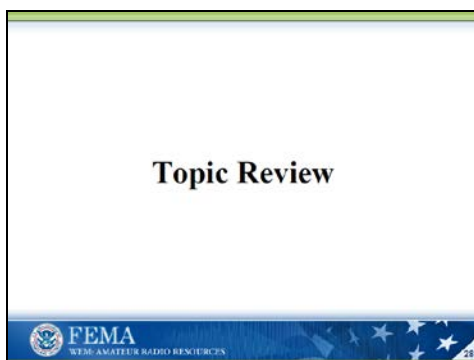
| Slides | Content |
|---|---|

**Visual 27**



## Case Study: Columbia County, Part 2

What challenges do the ham radio operators face when trying to get involved and offer their services during emergencies?

**NOTES:**

**Visual 28**



## Topic Review

There are a number of organizations of volunteer amateur radio operators that operates under the direction of a State or local emergency management agency to provide communications links in the event of a disaster or communications breakdown.

**Which amateur radio group is an official activity defined by the FCC and administered by FEMA?**

.

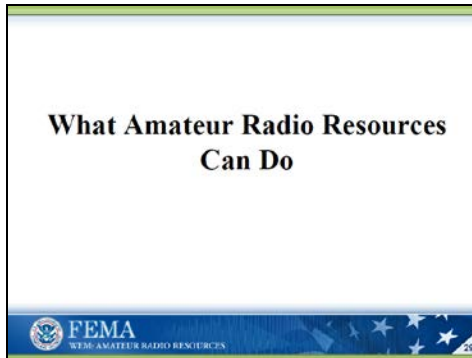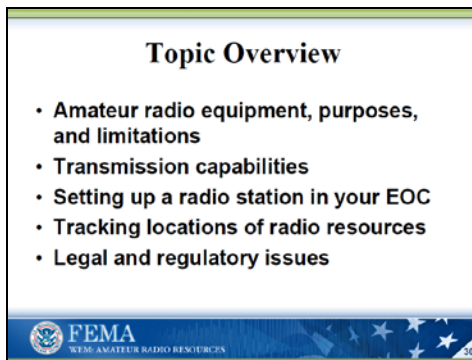| Slides | Content |
|---|---|
| | • ***When emergency management agencies work with RACES organizations, who controls the selection, testing, training, and exercising of RACES volunteers?*** |
| | • ***What are the five types of emergency communications that RACES members are authorized to transmit?*** |

**NOTES:**

| Slides | Content |
|---|---|

**Visual 29**

# Topic 3: What Amateur Radio Resources Can Do

**What Amateur Radio Resources Can Do**

FEMA
WEM: AMATEUR RADIO RESOURCES

**NOTES:**

**Visual 30**

**Topic Overview**

- Amateur radio equipment, purposes, and limitations
- Transmission capabilities
- Setting up a radio station in your EOC
- Tracking locations of radio resources
- Legal and regulatory issues

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## Topic Overview

Next, you will learn about the capabilities of amateur radio resources. This topic will also briefly summarize legal and regulatory issues related to the use of amateur radio resources.

When you finish this topic, you should be able to:

- Describe the purposes and limitations of the equipment used by amateur radio operators.
- Describe amateur radio's capabilities to transmit voice, data, and images.
- Explain the advantages of setting up a radio station in your Emergency Operations Center (EOC).
- Explain how to track locations of radio resources, antennas, and repeaters.
- Explain legal and regulatory issues governing the use of amateur radio resources.

| Slides | Content |
|---|---|

**Visual 31**



### Radio Frequencies

A radio "band" is a group of frequencies. In addition to the specific bands of the radio spectrum set aside for government, military, and commercial radio uses, there are bands set aside for amateurs. Depending on which band is used, amateur radio operators can talk across town, around the world, or out to satellites in space.

*There are additional, more detailed charts in the appendices.*

**160 Meters**
General, Advanced, Amateur Extra licensees:
1.800-2.000 MHz:

**80 Meters**
Novice and Technician licensees:
3.525-3.600 MHz:
General class:
3.525-3.600 MHz:
3.800-4.000 MHz:
Advanced class:
3.525-3.600 MHz:
3.700-4.000 MHz:
Amateur Extra class:
3.500-3.600 MHz:
3.600-4.000 MHz:

**60 Meters: Five Specific Channels**
**(Not on Visual due to limited Amateur use)**
The FCC has granted hams secondary access on five discrete channels. Amateurs cannot cause inference to and must accept interference from the Primary Government users.
General, Advanced and Amateur Extra licensees:

**Channel Center**
5332 kHz
5348 kHz
5368 kHz
5373 kHz
5405 kHz (common US/UK)

| **Slides** | **Content** |
|---|---|
| **Visual 31**<br><br>(Continued)<br><br>**Amateur Radio Frequencies**<br><br>160 Meters 1.800-2.000 MHz 80 Meters 3.525-4.000 MHz<br>40 Meters 7.000-7.300 MHz 30 Meters 10.100-10.150 MHz<br>20 Meters 14.000-14.350 MHz 17 Meters 18.068-18.168 MHz<br>15 Meters 21.025-21.450 MHz 12 Meters 24.890-24.990 MHz<br>10 Meters 28.000-29.700 MHz 6 Meters 50.0-54.0 MHz<br>2 Meters 144.0-148.0 MHz<br>70 Centimeters 420.0-450.0 MHz<br>33 Centimeters 902.0-928.0 MHz<br>23 Centimeters 1240-1300 MHz<br><br>FEMA<br>WEM- AMATEUR RADIO RESOURCES | **40 Meters**<br>Novice and Technician licensees:<br>7.025-7.125 MHz :<br>General class:<br>7.025-7.125 MHz :<br>7.175-7.300 MHz::<br>Advanced class:<br>7.025-7.125 MHz :<br>7.125-7.300 MHz::<br>Amateur Extra class:<br>7.000-7.125 MHz :<br>7.125-7.300 MHz::<br><br>**30 Meters**<br>General, Advanced, Amateur Extra licensees:<br>10.100-10.150 MHz:<br><br>**20 Meters**<br>General class:<br>14.025 -14.150 MHz<br>14.225 -14.350 MHz:<br>Advanced class:<br>14.025 -14.150 MHz<br>14.175 -14.350 MHz:<br>Amateur Extra class:<br>14.000 - 14.150 MHz<br>14.150 -14.350 MHz:<br><br>**17 Meters**<br>General, Advanced, Amateur Extra licensees:<br>18.068-18.110 MHz:<br>18.110-18.168 MHz:<br><br>**15 Meters**<br>Novice and Technician licensees:<br>21.025-21.200 MHz:<br>General class:<br>21.025-21.200 MHz:<br>21.275-21.450 MHz:<br>Advanced class:<br>21.025-21.200 MHz:<br>21.225-21.450 MHz:<br>Amateur Extra class:<br>21.000-21.200 MHz:<br>21.200-21.450 MHz: |

| Slides | Content |
|---|---|

**Visual 31**
(Continued)

**Amateur Radio Frequencies**

| | | | | |
|---|---|---|---|---|
| **160 Meters** | 1.800-2.000 MHz | **80 Meters** | 3.525-4.000 MHz | |
| **40 Meters** | 7.000-7.300 MHz | **30 Meters** | 10.100-10.150 MHz | |
| **20 Meters** | 14.000-14.350 MHz | **17 Meters** | 18.068-18.168 MHz | |
| **15 Meters** | 21.025-21.450 MHz | **12 Meters** | 24.890-24.990 MHz | |
| **10 Meters** | 28.000-29.700 MHz | **6 Meters** | 50.0-54.0 MHz | |
| **2 Meters** | 144.0-148.0 MHz | | | |
| | | **70 Centimeters** | 420.0-450.0 MHz | |
| | | **33 Centimeters** | 902.0-928.0 MHz | |
| | | **23 Centimeters** | 1240-1300 MHz | |

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**12 Meters**
General, Advanced, Amateur Extra licensees:
24.890-24.930 MHz:
24.930-24.990 MHz:

**10 Meters**
Novice and Technician licensees:
28.000-28.300 MHz:
28.300-28.500 MHz:
General, Advanced, Amateur Extra licensees:
28.000-28.300 MHz:
28.300-29.700 MHz:

**6 Meters**
All Amateurs except Novices:
50.0-50.1 MHz:
50.1-54.0 MHz:

**2 Meters**
All Amateurs except Novices:
144.0-144.1 MHz:
144.1-148.0 MHz:

**1.25 Meters**
**(Not on Visual due to limited Amateur use)**
The FCC has allocated 219-220 MHz to amateur use on a secondary basis.
Novice, Technician, General, Advanced, Amateur Extra classes:
 222.00-225.00 MHz:

**70 Centimeters**
All Amateurs except Novices:
 420.0-450.0 MHz:

**33 Centimeters**
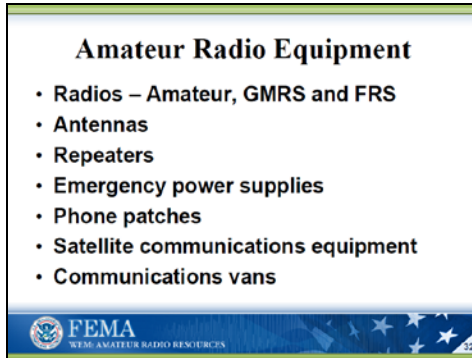All Amateurs except Novices:
 902.0-928.0 MHz:

**23 Centimeters**
Novice class:
1270-1295 MHz:
All Amateurs except Novices:
1240-1300 MHz:

| Slides | Content |
|---|---|

**Visual 32**



**Amateur Radio Equipment**

*Note: This list presents an overview of amateur radio equipment. Additional slides are provided to guide a more thorough discussion of the equipment. If a demonstration is possible, it can be done with the assistance of or in place of these slides.*

Amateur radio operators and amateur radio clubs have their own equipment, which may include:

- Radios – Amateur, GMRS and FRS
- Antennas
- Repeaters
- Emergency power supplies
- Phone patches
- Satellite communications equipment
- Communications vans.

**Visual 33**



**Radios**

Radios may be used to transmit and receive voice and data. They may be handhelds, portables, base stations, or mobiles.

An amateur radio station can be situated in an emergency operating center (EOC), or an amateur radio operator can transport radio communications equipment to the command post at the scene of a disaster and provide communications back to an EOC.

| Slides | Content |
|---|---|

**Visual 34**



The General Mobile Radio Service (GMRS) is a -mobile FM UHF radio service designed for short-distance two-way communication. It requires a license, the license is valid for an adult as well as his or her immediate family members.

The Family Radio Service (FRS) is an improved walkie talkie radio system authorized in the United States since 1996. This personal radio service uses channelized frequencies around 462 and 467 MHz in the ultra-high frequency (UHF) band, also used by cordless phones, toys, and baby monitors.

Citizens' Band radio (**CB radio**) is a system of short-distance radio communications between individuals on a selection of 40 channels within the 27-MHz (11 m) band.

**Antennas**

Critical to the operation of amateur radio equipment is the capability to send and receive radio signal. For this purpose, antennas are required. The antenna is the part of a radio system that radiates or receives the radio signal. Although amateur radio operators will generally supply radios and other equipment, antennas may need to be supplied by the emergency management agency.

**Visual 35**



Very simple antennas can be set up quickly wherever they are required. The photo on the slide shows an antenna held upright by a ladder. They can also be positioned in a bucket with rocks surrounding the pole.

To make the most effective use of amateur radio in emergencies, the emergency management agency should also install permanent fixed antennas (e.g., atop the EOC, a water tower, etc.).

Hams use many different kinds of antennas, but the most common are wire, verticals, or beams.

- Wire antennas are most often used in the HF bands. They are simply a length of wire attached to the transceiver. They must usually be of a certain length so they will perform well at a particular frequency.

- Vertical antennas can be designed for a single band or for many bands. They can be used in mobile situations as well as fixed stations. Vertical antennas are characterized by the fact that they radiate and receive radio signals omnidirectional, that is, equally in all directions.

  - Beam antennas have the advantage of being directional; they can be pointed in any direction so that, for transmission, more of the signal can be directed where desired. For reception, stations can be heard from a particular area
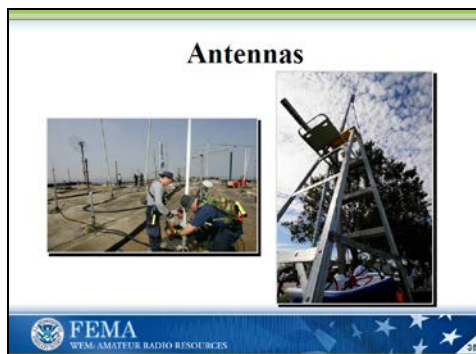
| Slides | Content |
|---|---|

Beam antennas have the advantage of being directional; they can be pointed in any direction so that, for transmission, more of the signal can be directed where desired. For reception, stations can be heard from a particular area better than with an omnidirectional antenna.

**Visual 36**



**Repeaters**

Repeaters are ham radio relay stations. Repeater antennas are typically placed on the tops of mountains or very tall buildings so that the line-of-sight distance they cover is quite large. Repeaters allow hams using low-power, mobile, or hand-held radios to transmit and receive from stations 50 or even 75 miles away.

Amateur radio operators usually supply their own repeaters; often, the repeaters consist of equipment that has been modified for use on ham frequencies. If the emergency management agency does need to provide the equipment, however, it is generally not very expensive.

State and local emergency management agencies may have a State or locally owned repeater network that allows amateur radio transmissions. (Often, in an emergency, a State or locality will let only RACES stay on the network, allowing it to preempt ARES and other amateur radio transmissions.)
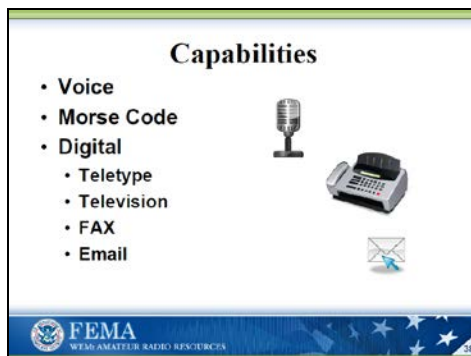
| Slides | Content |
|---|---|

**Visual 37**



**Other Equipment**

- Satellite Communications Equipment
- Emergency power supplies
  - o  Batteries
  - o  Generators
- Communications vans and mobile command posts
- Phone patches for interconnecting radio equipment to local telephone lines for communicating between two points where long-haul telephone circuits may be damaged or overloaded

Keep in mind that emergency managers can coordinate with home stations as well, so some of the equipment may not be in the EOC. The particular equipment installed in the EOC may vary depending on how the RACES officer and local clubs work.

**Visual 38**



**Instructor Note**

**List the Capabilities identified in this slide and explain digital capabilities will be discussed in the next slide**

**Capabilities**

Amateur radio operators have the ability to transmit voice, data, and images.
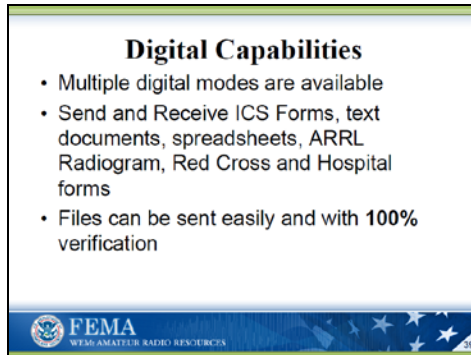
- Voice communication is the mode we are all familiar with. Generally, when we think of ham radio operators, we think of people communicating vocally using a microphone.
- Morse code, Referred to by hams as "cw" (for continuous wave), this is the mode used by the early radio pioneers. While slower than most modes (a faster operator can send and receive upward of 20 words per minute), Morse code will get through in poor transmission conditions when nothing else will.

| Slides | Content |
|--------|---------|

**Visual 39**

**Digital Capabilities**
- Multiple digital modes are available
- Send and Receive ICS Forms, text documents, spreadsheets, ARRL Radiogram, Red Cross and Hospital forms
- Files can be sent easily and with **100%** verification

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The wide spread use of PCs and Digital Signal Processing (DSP) is allowing radio amateurs to use these tools to develop new modes of digital communication. The distinguishing features of live digital operation today are the use of lower power, and compact or indoor antennas.   A number of the software programs needed for digital communications are Freeware.  Some of the more common digital modes are listed.

- Packet Radio is thirty year old technology, however many parts of the country still use Packet as their primary means of sending data traffic.  Packet Radio is not a good method of sending data files such as pictures and spreadsheets.  Packet is a particular digital mode of Amateur Radio communications which corresponds to computer telecommunications. The modem is replaced by a terminal node controller (TNC); the telephone is replaced by an amateur radio transceiver, and the phone system is replaced by the amateur radio waves. Packet radio takes any data stream sent from a computer and sends that via radio to another amateur radio station similarly equipped. Packet radio is so named because it sends the data in small bursts, or packets.

- Packet has three great advantages over other digital modes: transparency, error correction, and automatic control. Another advantage of packet over other modes is the ability for many users to be able to use the same frequency channel simultaneously.

- The operation of a packet station is transparent to the end user; connect to the other station, type in your message, and it is sent automatically. The terminal Node Controller (TNC) automatically divides the message into packets, keys the transmitter, and then sends the packets. While receiving packets, the TNC automatically decodes, checks for errors, and displays the received messages. Packet radio provides error free communications because of built-in error detection schemes.

| Slides | Content |
|---|---|

**Visual 39**
(continued)
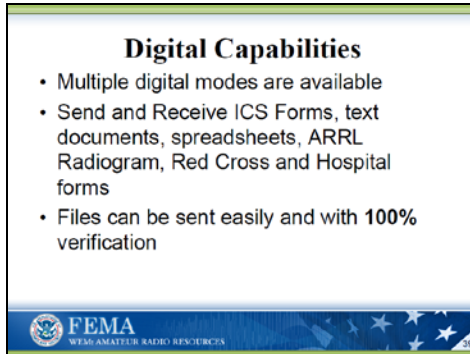


- Narrow Band Emergency Messaging System (NBEMS)

- NBEMS is rather new suite of programs that is rapidly gaining support and use across the country. NBEMS has the ability to send message forms, pictures and spreadsheets in an acceptable time span.

- The Narrow Band Emergency Messaging System (NBEMS) is a suite of software programs designed for fast, error-free, long-distance emergency messaging. NBEMS is an Open Source software suite that allows amateur radio operators to reliably send and receive data using nearly any computer (Windows, Mac, and Linux) and any analog radio. NBEMS software provides a digital radio sound card modem and a form-based messaging program in two separate applications that work together to form a perfect software suite for emergency radio digital communications. The software is free and multi-platform (Windows / Linux / Mac).

- NBEMS works on both VHF/UHF FM and on HF. FLDIGI handles a wide range of Amateur Radio digital modes. It is a computer program intended for Amateur Radio Digital Modes operation using a PC and operates in conjunction with a conventional HF SSB & VHF/UHF FM transceiver connected to the input and output sockets of the PC sound card. A serial port connection is used for rig control. FLDIGI is multi-mode, which means that it is able to operate many popular digital modes without switching programs, so you only have one program to learn. It includes all the popular modes, such as DominoEX, MFSK16, PSK31, and RTTY.

| Slides | Content |
|---|---|
| | • In the average RACES or ARES event , it is likely used to supplement  voice communications, not replace them.  Digital modes are likely used when an ARES/RACES station has already established voice communication with a desired target station (e.g. an EOC or shelter) .  During the event an agency may request that RACES/ARES send information that is very detailed, and accuracy is very important.  Via voice, to ensure accuracy, NTS-style radiograms could be used effectively but the dictation speed needed for accuracy will slow things down quite a bit.  If voice is the only means available, it will still work well, but the ability to use error correcting or error checking digital modes will greatly assist the operations. However, ICS forms such as ICS-259 are very detailed and sending via voice is nearly impossible.  So, in a real situation, the ham station may be having brief voice communication with an EOC or shelter and then decide to send a ICS-213, ICS-259 or Red Cross 5266 form via a digital mode.  Demonstrations of the newer higher speed PSK modes have shown that large files (260KB) can be send via NBEMS in as little as three to five minutes.. <br><br>• Amateur Television (ATV) <br> ○ ATV is a fast-growing mode which permits nearly broadcast-quality moving pictures to be transmitted with low-power equipment within the budget of many hams and emergency management organizations. It has proven useful in transmitting real-time aerial photographs of a disaster area and in scanning the horizon from a fixed high point for tornado detection. <br> ○ ATV is also called HAM TV or Fast Scan TV (FSTV). <br> ○ Slow Scan Television (SSTV) <br> ○ SSTV is the transmission of still pictures over radio. This mode is very bandwidth efficient, requires minimal equipment, and is good for transmission of maps, graphics, and pictures for damage assessment. SSTV is similar to a photographic slide show on the air. |

| Slides | Content |
|---|---|

**Visual 40**

Case Study:
Columbia County, Part 3

FEMA
WEMb AMATEUR RADIO RESOURCES
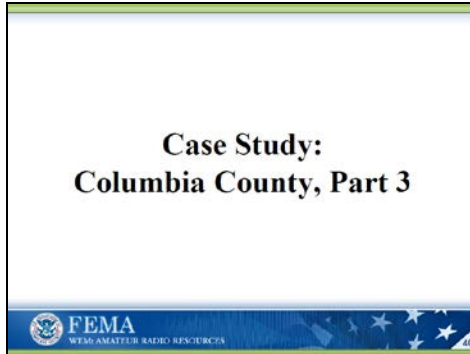
### Case Study: Columbia County, Part 3

- *What can you do to convince others in your community that amateur radio operators should be included in emergency planning and response efforts?*

- *What are the advantages and disadvantages of establishing an amateur radio station in the EOC?*

**NOTES:**

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**Visual 41**

Setting up a Radio Station
in Your EOC

FEMA
WEMb AMATEUR RADIO RESOURCES
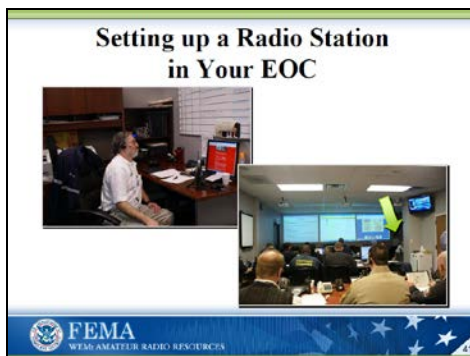
### Setting up a Radio Station in Your EOC

These pictures show how Pulaski County, Arkansas, has set up an amateur radio station in the corner of the EOC. This arrangement allows the radio operator to see and hear everything that is happening and enables him or her to participate in briefings and discussions. A headset can be used to control the noise level from radio communications in the EOC.

If needed, the radio operator can hand the microphone to someone else in the EOC and let that person speak directly to a counterpart in the field. According to Title 47 CFR Part 97.115, during third-party communications, the amateur radio operator must be present and continuously monitoring and supervising the third party's participation.

.

| Slides | Content |
|---|---|
| | In some EOCs, the ham operator is in a room off to the side or down the hall, removed from the EOC activity. Verbal or written messages are passed back and forth via runner. This arrangement may work when there are only a few formal, written messages to the state EOC, but is not recommended if amateur radio is needed to replace or supplement the tactical communication systems used every day by public safety agencies. |

Local amateur radio operators can help you set up a radio station in your EOC and should be involved in the process.

**To locate hams in your area, search:**
**http://emergency-radio.org/findclub.html**
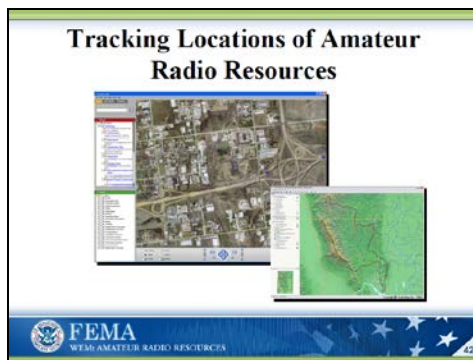
**Tracking Locations of Amateur Radio Resources**

Geographic Information System (GIS) is a database system that can analyze and display data using digitized maps and tables for planning and decision making. Many EOCs use GIS tracking to mark locations of interest during an emergency, such as impact zones or shelters. You can also use these systems to track locations of amateur radio resources such as antennas.

Communities can use *Google™ Earth* to track locations of interest (with *Google™ Earth Pro*, they can import GIS data).

Other software includes *MapWindow* (free GIS program) and the *Shape2Earth* plug-in for *MapWindow*.

Many amateur radio operators have GPS units, and can provide latitude and longitude of their location, which is helpful for tracking storm spotters or reporting damage in the field.

Online resources for tracking locations of interest are listed in Appendix C.

| Slides | Content |
|---|---|

**Visual 43**
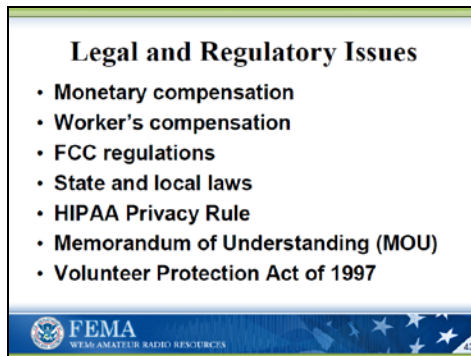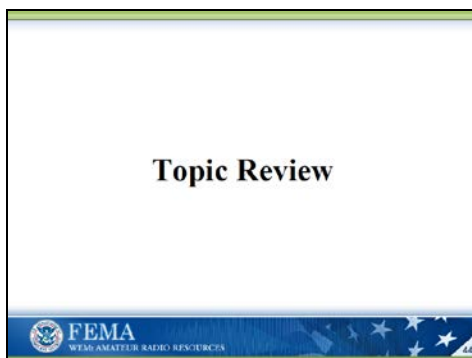
**Legal and Regulatory Issues**

- Monetary compensation

  o Amateur radio operators (including RACES members) are not allowed by law to receive monetary compensation for their services.

- Worker's Compensation

  o An emergency management agency may be able to cover RACES members under their worker's compensation insurance since these volunteers are enrolled in the agency. Worker's compensation regulations may vary, so emergency management officials should check their state or local requirements.

- FCC regulations for the amateur radio service

  o These regulations are in 47 CFR Part 97 and cover many items, including licensing of operators and licensing of stations, emissions, types of transmissions that can be made, the frequencies that can be used, and required authorizations.

- State and local laws

  o State Statutes or local codes may exist regarding volunteers to State and local government in providing volunteer emergency and disaster relief Service. An emergency management agency planning to use amateur radio resources should check into these laws.

- HIPAA Privacy Rule

  o The Health Insurance Portability and Accountability Act (HIPAA) helps guarantee patient confidentiality. As a general rule, personally identifiable information should not be transmitted. However, there are certain circumstances during an emergency in which amateur radio operators may legally transmit patient information at the request of medical professionals.

| Slides | Content |
|--------|---------|
|  | • Memorandum of Understanding (MOU) |
|  |      o A Memorandum of Understanding (MOU), mutual aid agreement, and other type of agreement should be drawn up to allow for sharing of RACES volunteers with other States or localities. An MOU can also be used to allow RACES to have priority on specific networks. It can enable RACES to use and preempt an amateur radio club's repeater network system in an emergency (as permitted by FCC regulations). |
|  | • Volunteer Protection Act of 1997 |
|  |      o This Act provides liability protection for volunteers. The purpose of the Act is to "promote the interests of social service program beneficiaries and taxpayers and to sustain the availability of programs, nonprofit organizations, and governmental entities that depend on volunteer contributions by reforming the laws to provide certain protections from liability abuses related to volunteers serving nonprofit organizations and governmental entities." |
| **Visual 44** | **Topic Review** |
| **Topic Review** <br> FEMA <br> WEMb AMATEUR RADIO RESOURCES | Amateur radio operators provide their own equipment, including radios, antennas, repeaters, phone patches, and communications vans. In addition, they may have the ability to transmit voice, data, and images through a variety of means, allowing emergency managers and other response organizations to communicate with one another whether or not they have compatible communications systems. |
|  | Amateur radio operators must comply with FCC regulations as noted in 47 CFR Part 97, and with State and local laws where applicable. Establishing a viable RACES program requires the emergency management officials to be aware of the applicable regulations and adhere to them strictly. |

| Slides | Content |
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| | • ***What piece of equipment is typically placed on the top of a mountain or a very tall building to allow hams to transmit and receive from stations 50 or even 75 miles away using low-power, mobile, or hand-held radios?*** |
| | • ***Besides voice transmissions, what are some of the capabilities of amateur radio?*** |
| | • ***Why might it be a good idea to set up an amateur radio station in your EOC?*** |
| | • ***How can your community keep track of amateur radio resources?*** |
| | • ***What type of agreement can allow RACES to use and preempt an amateur radio club's repeater network system in an emergency (as permitted by FCC regulations)?*** |

| Slides | Content |
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**Topic 4: How to Achieve a Successful Amateur Radio Organization**

**Visual 45**
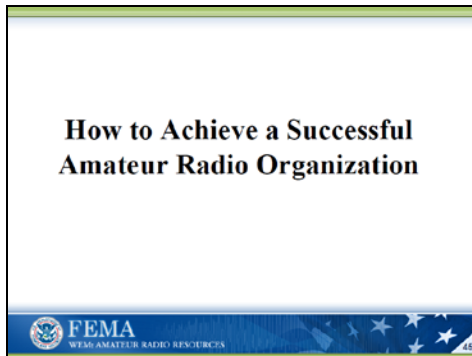


*If available, the following handouts would be beneficial in this section:*

1. *State or local definition of RACES/ACS*

2. *Specific State and local guidelines on establishing RACES*

3. *Specific State and local RACES/ACS plans and RACES annexes from Emergency Operations Plan.*

4. *Sample RACES/ACS application for particular State or locality.*

5. *Sample RACES handbook for a particular State or locality.*

6. *Sample message handling instructions and format.*

7. *Sample RACES/ACS newsletter for a particular State or locality.*

8. *Sample RACES/ACS recognition award certificate for a particular State or locality.*

*Note: The following Web site contains a long list of amateur radio emergency communications organizations in the United States:*

*http://www.qsl.net/races/links.html*

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**Visual 46**
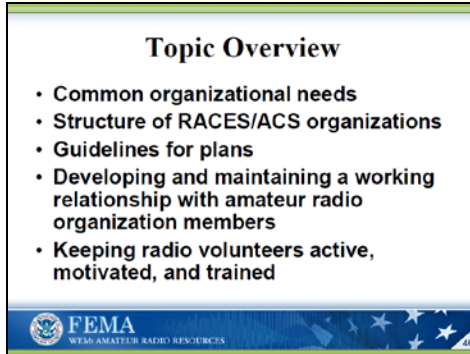


**Topic Overview**

Next, you will learn how to successfully incorporate amateur radio resources into emergency operations and achieve a successful Radio Amateur Civil Emergency Service (RACES) organization.

When you finish this topic, you should be able to:

- List the four common organizational needs of emergency management agencies and RACES/ACS.

- Describe the variables that determine how RACES/ACS organizations are structured.

- Describe basic guidelines for developing a RACES/ACS plan.

- Explain how to develop and maintain an effective working relationship with amateur radio organization members.

**NOTES:**

| Slides | Content |
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**Visual 47**
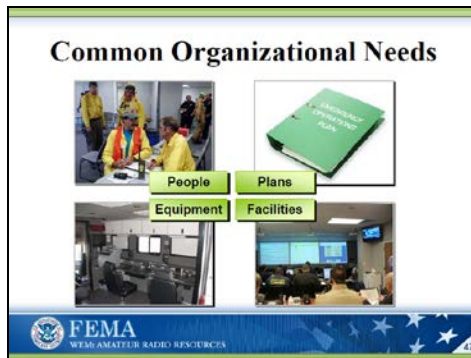


## Organizational Needs

Each mission area of emergency management (mitigation, protection, prevention, response, and recovery) requires the same things—people, plans, equipment, and facilities. To effectively integrate amateur radio into emergency management capabilities, the same four factors need to be addressed.

Both the emergency management agency and RACES/ACS have these common organizational needs.

- People
    - Emergency management needs to identify, train, exercise, and manage its people.
    - RACES people are the hams who need to be identified, trained, exercised, and managed as part of the emergency management agency.

- Plans
    - Emergency management needs plans to be developed, tested, refined, and disseminated to people who will implement them.
    - RACES needs plans to be developed, tested, refined, and disseminated to people who will implement them.

- Equipment
    - Emergency management needs equipment to be identified, acquired, deployed, tested, and maintained.
    - RACES needs equipment to be identified, acquired, deployed, tested, and maintained.

- Facilities
    - Emergency management needs facilities to be available and suitable to the function.
    - RACES need facilities to be available and suitable to allow the integration of RACES volunteers and emergency management.

- SM-47

| Slides | Content |
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**Visual 48**

### The RACES/ACS Officer



When establishing a RACES/ACS organization, the director of the State or local emergency management agency (or designee) should appoint in writing a reliable RACES/ACS officer to act as liaison between the radio organization and the emergency management agency.

**Visual 49**



The RACES/ACS Officer should be a General Class license holder (or higher) who is thoroughly knowledgeable of FCC rules and regulations, and who is familiar with the functions of the ARRL and ARES.

**Visual 50**



The RACES/ACS officer's duties may consist of

- Assisting the agency with radio plan development.

- Assisting in development and expansion of the organization.

- Recruiting members.

- Assisting the emergency management agency in developing training programs for RACES/ACS members.

- Assisting the emergency management agency in developing RACES/ACS exercises and drills to maintain communications capabilities.

| Slides | Content |
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**Visual 51**
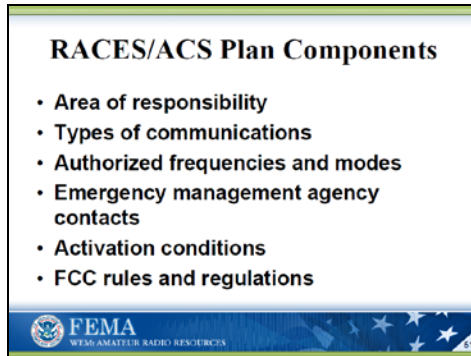


### Guidelines for RACES/ACS Plan Development

A critical element in working successfully is a well-written RACES/ACS plan. State and localities may have variations in their plans, and many communities combine the RACES plan with an ARES, ACS or other organization plan.

Some create a stand-alone document, and others have their plan as an annex to their emergency operations plans. Some States and localities simply include planning for radio operations as an appendix or in a section of their communications or emergency response plans.

Your community will need to determine whether to create a separate plan or combine the radio plan with another emergency communications plan, and whether the plan should stand alone or be included as an annex in an emergency operations plan.

However you choose to develop the plan, it must be created as a cooperative effort among amateur radio operators, emergency management officials, and other agencies to correlate with other emergency planning efforts.

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| **Slides** | **Content** |
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**Visual 51 (cont.)**
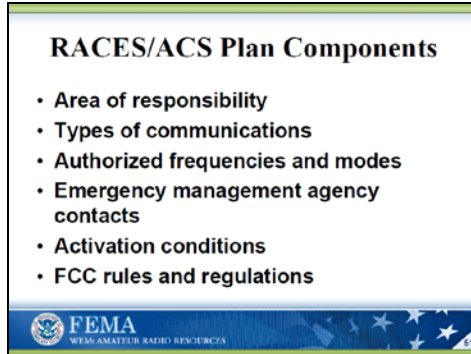


The following are some key factors that must be incorporated into an Amateur Radio Emergency Communications Plan.

The plan should:

- Identify the community or area of the RACES/ACS organization's responsibility.

- Identify the general types of communications support the RACES/ACS organization is intended to provide.

- Identify the authorized RACES frequencies and modes to be utilized during RACES operations.

- Identify the individual or individuals in the emergency management agency to whom the RACES organization reports. Include a blanket statement that makes clear that "FCC rules and regulations apply to the operation of a radio in the amateur service and therefore apply to the RACES organization."

- Define under what conditions the RACES/ACS organization will be activated. In accordance with the State or local emergency operations plan, the appropriate representative of the emergency management agency may activate the organization to provide communications support for one or more of the following needs:

  o Preservation of life or property.
  o Alleviation of human suffering or need.
  o Any disaster endangering the public.
  o Acts of sabotage.
  o Tests and drills.
  o Other reasons he/she may deem necessary.

| Slides | Content |
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**Visual 52**
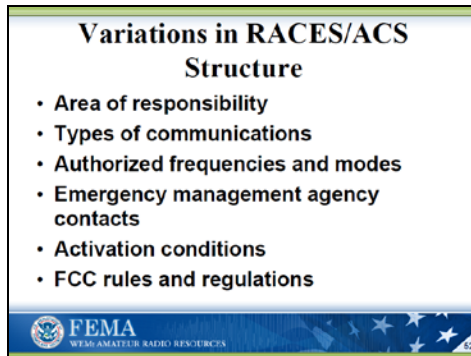


## Variations in RACES/ACS Structure

There are variations among States and localities in the way they structure and organize RACES/ACS. A State or locality may have specific guidelines on establishing a RACES/ACS organization, how it defines the use of RACES/ACS, and how it is organized in order to meet the specific needs of their particular situation.

- Some States and localities have a blanket statement that makes ARES members part of a RACES organization (as long as individual amateur radio operators register and are accepted and enrolled by the emergency management agency).

  - Such a statement might be in a Memorandum of Understanding (MOU) between the State (or locality) and an ARES group, or in a RACES/ACS plan. In other jurisdictions, instead of issuing a blanket ARES/RACES statement, the emergency management director or coordinator may carefully recruit, select, and screen the people who will become part of the agency's RACES/ACS organization. State RACES/ACS organization enrollment versus local organization enrollment.

- A State emergency management agency may require that RACES/ACS volunteers in a State organization be enrolled only in the State RACES/ACS organization and not in a local organization.

- Some localities require members to live in their locality.

- Some State and local emergency management agencies may have minimum age requirements for members.

  - Some States and localities have designed tests (and probation periods) that applicants must pass prior to being made part of RACES/ACS.

| **Slides** | **Content** |
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| | • States and localities may have their own specially designed application for potential RACES/ACS members. |
| | • Some States may require potential members to register as volunteers with the State. |
| | • A State may have RACES/ACS structured according to regions within the State using regional RACES/ACS officers. |
| | • Some State emergency management agencies have localities send in their local plans and current rosters of members. |
| | • You will need to evaluate your own organizational needs, along with those of the amateur radio groups, to determine how best to establish, organize, and use RACES/ACS. Contact the communication officer within your State emergency management agency for information about other organizations in your area and to inquire about the possibility of partial funding that may available from FEMA for equipment and training. |

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**Visual 53**
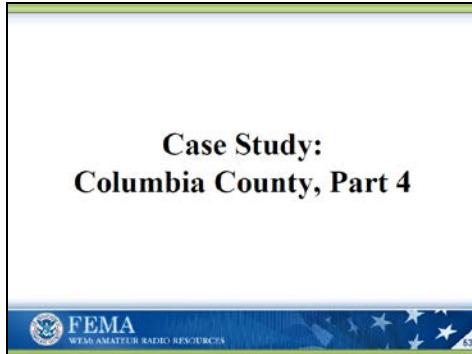
**Case Study: Columbia County, Part 4**

*A sample RACES plan developed for the case study is included in Appendix D.*



*An example manual for Arlington County, Virginia, is located at the following website:*

*http://www.w4ava.org/races/auxcomm01.htm*

- ***What are some components of the sample RACES plan that you particularly like?***

- ***Consider the needs of your community. What would you need to include in a RACES plan to accommodate those needs?***

The plan must be written as a cooperative effort among amateur radio operators, emergency management officials, and other agencies.

| Slides | Content |
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**Visual 54**

**Suggestions for RACES/ACS Plans**



Listed are examples of components that should be included in an Amateur Radio Emergency Communications Plan.

- Include a call-up roster of current members with call signs and other data as an appendix to the plan so that it can be updated periodically rather than needing frequent plan updates.

- Include maps showing locations of EOCs, repeater sites, links between EOCs provided by RACES/ACS, links between adjacent jurisdictions and adjacent States provided by RACES, and other important sites and information.

- Include information on how to contact RACES/ACS officers.

- Include an explanation of when RACES/ACS can be activated and who is authorized to do it (at least two people). In addition to activation procedures where a local emergency management officer or coordinator activates members, include activation procedures where the State would like a local emergency management agency to activate its RACES/ACS (if State and local RACES structure allows for this).

- Include an organizational chart of the RACES/ACS structure in your State or locality.

| Slides | Content |
|---|---|
| | • Include in an appendix: Mutual Aid Agreements, Memorandums of Understanding, and similar documents that relate to RACES/ACS. |
| | • Include citations to important documents that reference appropriate plans (e.g., State emergency operations plan, a local disaster response plan, a communications plan). |
| | Identify training needs (e.g., who will conduct the training, and when and where it will take place), as well as opportunities for exercises to keep volunteers active in community events. |

**Visual 55**
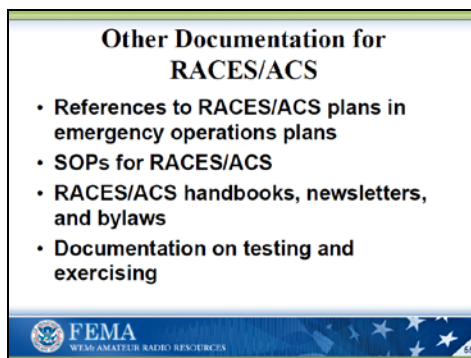
**Other Documentation for RACES**

In addition to RACES plans, other documentation often exists on RACES. This documentation includes:

- References to radio plans in emergency operations plans.

- Standard Operating Procedures (SOPs) for RACES/ACS, including activation procedures.

- RACES handbooks.

- Documents or forms showing message handling and format to be used by RACES/ACS.

- Newsletters.

- RACES/ACS organization bylaws.

- Training materials.

- Documentation on testing.

- *Documentation on exercising the radio team.*

| **Slides** | **Content** |
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**Visual 56**
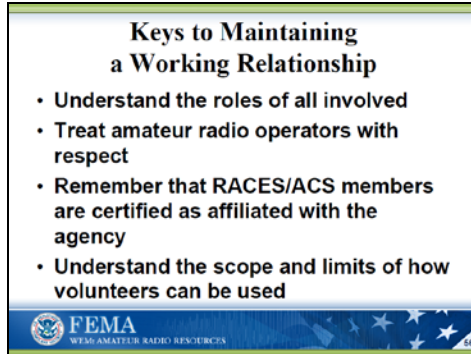


**Keys to Maintaining a Working Relationship with Amateur Radio Organization Members**

It is important that State and local emergency management officials develop and maintain an effective, working relationship with their RACES/ACS and ARES organizations.

- In order to achieve this, all parties should understand the roles of the individuals and organizations involved:

    o The emergency management director or coordinator.
    o The emergency management agency's communications officer.
    o The RACES/ACS officer.
    o The RACES/ACS/ARES volunteers.

- Emergency management officials should treat amateur radio volunteers with the respect that they show their regular emergency management agency staff.

- Remember that RACES/ACS members are certified as affiliated with the emergency management agency.

- At the same time, emergency management officials should keep in mind that the amateur radio operators are volunteering their time and energies and should understand the exact scope and limits of how they can use these qualified volunteers.

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**Visual 57**
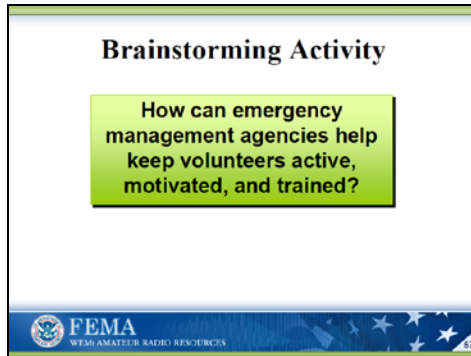
### Brainstorming Activity



Brainstorm ways that emergency management agencies can help ensure that amateur radio volunteers remain active, motivated, and trained.

- Include amateur radio volunteers in exercises, community activities, and public service events.
- Provide training in communications-related areas and emergency management procedures.
- Invite amateur radio club members to emergency management activities and affairs.
- Have emergency management officials attend amateur radio club meetings.
- Produce a newsletter about amateur radio.
- Issue recognition certificates.
- Recognize the invaluable contribution by amateur radio volunteers at every opportunity.

**Visual 58**
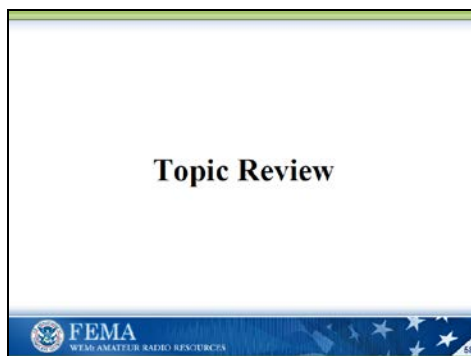
### Topic Review



Although there are variations in the way different States and localities structure their RACES/ACS programs, any establishment of an organization must include development of a detailed plan that covers the relationships and roles of all parties involved. Building on the plan includes developing and maintaining effective working relationships and investigating funding options for radio activities.
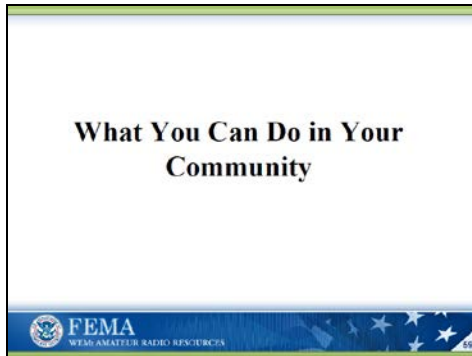
| Slides | Content |
|--------|---------|
|        | • **What four organizational needs do RACES/ACS and emergency management agencies have in common during each phase of emergency management?** |
|        | • **What variations in State and local requirements should you consider when establishing a RACES/ACS organization?** |
|        | • **Why do you need a plan? What should the plan include?** |
|        | • **What are some ways you can develop and maintain a good working relationship with amateur radio organization members?** |

| Slides | Content |
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| | **Topic 5: What You Can Do in Your Community** |
| **Visual 59** | |



| **Visual 60** | **Topic Overview** |
| --- | --- |
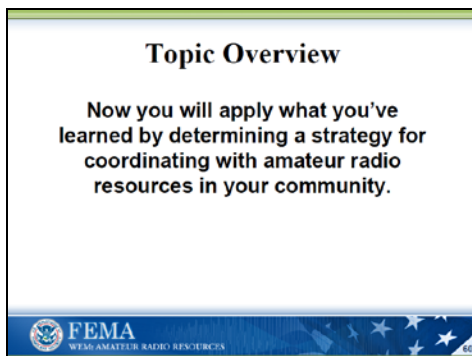


**Topic Overview**

Now, you will apply what you've learned by determining a strategy for coordinating with amateur radio resources in your community.

| Slides | Content |
|--------|---------|
| | |

**Visual 61**

**Case Study: Columbia County, Part 5**
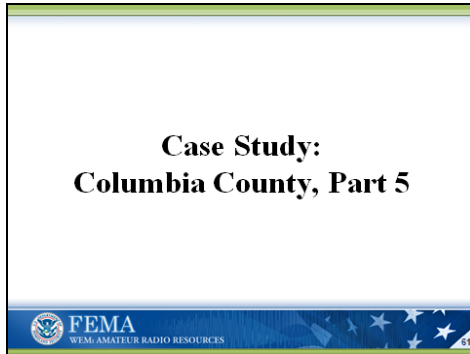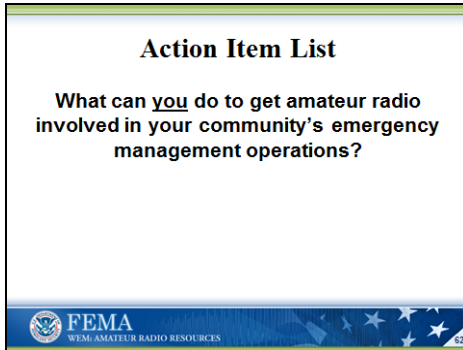


- *What are the factors that contributed to the ultimate success of the amateur radio operators' involvement in emergency management?*
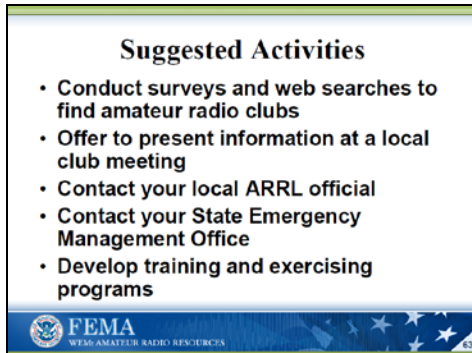
**NOTES:**

| Facilitator Cues | Instructional Content |
|---|---|

**Visual 62**



**Action Item List**

Working on your own, create a list of action items for coordinating with amateur radio resources in your community. The action items you list should be within your realm of responsibility and capability.

**Visual 63**



**Suggested Activities**

Suggested action items:

- Conduct a web search to find amateur radio clubs and seek out representatives of your local club.

- Volunteer to present a program on emergency management and the need for amateur radio support at a future club meeting.

- Contact your local ARRL official.

- Contact your State or local emergency management office.

- If you already have a RACES, ACS or ARES organization in place, work closely with the organization in developing a meaningful training and exercising program for the organization.

Point out that a list of local clubs and contact information for local ARRL officials can be found at www.arrl.org.

| Facilitator Cues | Instructional Content |
|---|---|

**Visual 64**
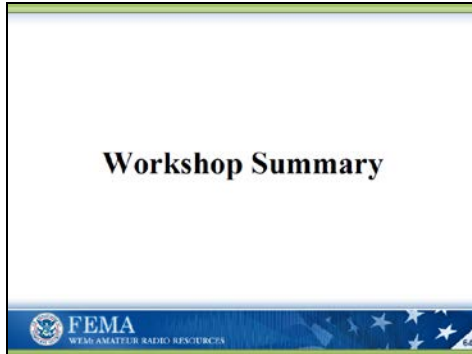
## Workshop Summary



In this workshop, you've learned about the benefits of involving amateur radio resources in your emergency management operations.  You should now be equipped to find amateur radio groups in your area or help form new ones if needed, and to coordinate with RACES organizations. The list of action items you created will help you take advantage of the resources that amateur radio can provide in emergencies.

**NOTES:**