

**Course Title: Radiological Control Technician**  
**Module Title: Communication Systems**  
**Module Number: 2.02**

**Objectives:**

- 2.02.01 Explain the importance of good communication.
- 2.02.02 Identify two methods of communication and be able to determine different types of each.
- 2.02.03 Describe different types of communication systems.
- 2.02.04 Describe the FCC and DOE guidelines regarding proper use of communication systems.
- 2.02.05 Describe general attributes of good communications.
- 2.02.06 Explain the importance of knowing how to contact key personnel.
- ☞ 2.02.07 Identify the communication systems available at your site and methods available to contact key personnel.
- ☞ 2.02.08 Describe the emergency communication systems available at your facility.

**References:**

1. DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities
2. 505203-07 INL Emergency Plan/RCRA Contingency Plan – Section 5 - Notifications and Communications
3. PRD-183-3, Radiological Control manual, Conduct of Radiological Work

*2.02.01 Explain the importance of good communication*

## **IMPORTANCE OF COMMUNICATION**

Good communication is important in everyday life to make sure our message is clear, understood, and received. A clear concise communication eliminates confusion and the possibility of misunderstanding. It is important that the receiver understand the communication without unnecessary interpretation or guess work. For a communication to be completed there must be a receiver. The receiver is the person or group that the communication is intended. For a good communication process, there must be a clear concise message, a medium of transmission (i.e., telephone, telegraph, E-mail, letter, signal flag, etc.), and a receiver. If a response is required by the receiver, this can serve as confirmation of reception of the communication; however, a response alone does not indicate the communication was understood correctly. Misunderstanding of communication can potentially cause personal as well as physical damage to equipment and surroundings.

In all communication processes, a sender of the communication must not assume knowledge that is needed for safe execution of the desired response. The communication must contain all pertinent information. Assuming or hoping the receiver has a given understanding of a process can lead to an unsafe condition. This is especially true in emergency situations that require immediate action or response. Make sure in all communications that desired responses are not outside the abilities or scope of the individual or group.

*2.02.02 Identify the two methods of communication and be able to determine different types of each.*

## **METHODS OF COMMUNICATION**

In today's atmosphere of technology, there are methods of communications that seemed unlikely just 20 years ago. Who would have thought that a car phone would be as common as a home telephone? In general, communication can be broken into two groups, verbal and nonverbal.

Verbal methods of communication include talking directly to another person, telephone conversation, radio conversations, voice mail, video teleconferencing, and various other available mediums. Verbal methods generally allow discussion of details followed by questions and/or an immediate response. Verbal communication allows flexibility in the message along with added information without too much difficulty in transmission.

Nonverbal methods of communication include signs, letters, signals, gestures, documents, E-mail, and various other available mediums. Nonverbal methods can limit the amount of information transmitted due to the difficulty in the transmission method.

2.02.03 *Describe different types of communication systems.*

## **COMMUNICATION SYSTEMS**

There are several communication systems available at the ICP. These may include public address system, telephones, two-way radio, pagers, computer mail system, and computer based bulletin boards. Following is a brief generic description of each of these communication systems. The description is not meant to be all inclusive, but a cursory overview of key aspects of each system.

### **Public Address**

The public address system consists of loudspeakers and calling stations located throughout an area to provide audible notification to all personnel within the area. The public address system may be used for routine messages, contacting groups or individuals, items of interest to the general population, and emergency notifications or warnings. The public address system is administratively controlled to ensure effectiveness in contacting facility personnel and availability during emergency conditions.

### **Telephones**

Telephones provide a means for point to point communication. The telephone may be considered semiprivate when compared to the public address system; however, all calls are subject to monitoring for security reasons. The telephone system may offer the ability to leave a voice message whenever the receiving party is unavailable. The telephone system provides a method of communication, but is subject to usage by other individuals which may impede your contacting the person or persons needed in an emergency situation.

### **Two-way Radio**

Two-way radio communication provides a direct link to other individuals on your frequency or net. Although "traffic" on the radio may impair your message from being clearly understood, usage is controlled by possession of a radio with the correct frequency. Radio communication is subject to interference by outside sources, which may garble or mask the message. This may be of significance during emergency situations when location or type of emergency in progress must be relayed to response teams. Two-way radios do provide mobility and access while at remote locations.

### **Pagers**

Pagers are small electronic devices capable of receiving signals from the telephone system to alert the carrier of intended communication from another party. Pagers provide access to personnel while away from the work location. Most pagers provide only a voice message or phone number to contact. Pagers normally do not allow the carrier to respond directly to the page verbally. Pagers provide a means of contacting personnel when there whereabouts are unknown, but are assumed to be within the site boundaries or very nearby.

## Computer Mail Systems

Computer mail systems provide communication between computer terminals. Most systems are linked via a local area network. This links enables users to contact individuals or groups directly and leave written messages for these individuals to receive. Computer mail systems enable the user to contact receivers directly while other users are unaware.

*2.02.04 Describe the FCC and DOE guidelines regarding proper use of communication systems.*

## FCC AND DOE RULES AND REGULATIONS

When using communication systems licensed by the Federal Communications Commission and operated by the Department of Energy, one cannot:

- Use profane, indecent, or obscene language.
- Willfully damage or permit radio equipment damage.
- Cause malicious interference with any radio communications.
- Intercept and use or publish the contents of any radio message without the permission of the proper authorities.
- Make unnecessary, false or unidentified transmissions.
- Transmit without first making sure that the transmission will not cause harmful interference.
- Make any adjustments, repairs, or alterations to a radio transmitter without licensing by the FCC or acceptable equivalent.
- Transmit a call sign, letter, or numeral which has not been assigned to your station.
- Rebroadcast another transmission (i.e. radio station music).

*2.02.05 Describe general attributes of good communications.*

## GENERAL ATTRIBUTES OF GOOD COMMUNICATIONS

- Minimize the use of abbreviations and acronyms. Only abbreviations and acronyms from an approved list should be used in facility communication.
- Make all oral instructions clear and concise. Do not include multiple actions in a verbal instruction which may get confused or misunderstood.
- Ensure the identity of the person(s) is/are clearly understood. Identify yourself and your position, and ensure that you know to whom you are speaking.
- Use clear, precise terminology. Do not use slang terms. Avoid words that sound alike. Use commonly agreed upon terms. Employ the phonetic alphabet for clarification. (See Table 1)
- Repeat back messages, either paraphrased or verbatim.
- Speak distinctly and deliberately.
- Acknowledge all communications.

**Table 1. Phonetic Alphabet and Numbers**

A - Alpha	J - Juliet	S - Sierra	1 - One
B - Bravo	K - Kilo	T - Tango	2 - Two
C - Charlie	L - Lima	U - Uniform	3 - Three
D - Delta	M - Mike	V - Victor	4 - Fower
E - Echo	N - November	W - Whiskey	5 - Fife
F - Foxtrot	O - Oscar	X - X-Ray	6 - Six
G - Golf	P - Papa	Y - Yankee	7 - Seven
H - Hotel	Q - Quebec	Z - Zulu	8 - Eight
I - India	R - Romeo	. - Point	9 - Niner
			0 - Zero

2.02.06 *Explain the importance of knowing how to contact key personnel.*

## CONTACT OF KEY PERSONNEL

The importance of knowing how to contact key personnel can not be understated. The importance lies in getting the knowledgeable people to the location where they are needed. This can apply to emergency situations, routine circumstances, or non-routine circumstances. The ability of the RCT to contact key personnel can reduce personnel injury, equipment damage, uncontrolled radioactive release, uncontrolled movement of radioactive materials, and other important actions. The RCT must be aware of the location of communication equipment, phone numbers or pager numbers, and/or emergency numbers regardless of location. Familiarity with the working environment will reduce the time needed to contact key personnel. The RCT must be aware of the location, situation, and personnel or equipment involved. This information must be relayed without misinterpretation to key personnel to afford proper response.

☞ 2.02.07 *Identify the communication systems available at your facility and methods available to contact key personnel.*

## SITE COMMUNICATION SYSTEMS

### ICP Specific Information

The following devices are used for communication at the ICP:

- |   |             |   |                        |
|---|-------------|---|------------------------|
| - | Telephones  | - | Trunk (two-way) radios |
| - | Cell Phones | - | Pagers                 |
| - | E-mail      | - | Voice Paging           |

### Important Telephone Numbers

In the event that you should be involved in, or come upon on, an accident scene that requires emergency help, you should memorize the following phone numbers:

INL Fire Department: **777** - If you are on-site and need to call for the Fire Department or for Emergency Medical help, use this number.

Warning Communications Center (WCC): **526-1515**, this number will get you in contact with help, both on-site and off-site. Use this number if you have a cell phone and/or are in need of emergency help while traveling to and from the site and do not have access to a land-line telephone. You can also dial 526-7777 from a cell phone to get emergency help or 9-911 from an in-town phone.

☞ 2.02.08 Describe the emergency communication systems available at your facility.

## SITE EMERGENCY COMMUNICATIONS

### ICP Specific Information

The following are used to contact personnel and communicate during emergencies at the ICP:

- Facility voice paging
- ICP Public address system
- Trunk radios
- E-mail, telephones
- Cell phones
- Sirens
- Alarms

EPI-83, “Radio Protocol”, instructs personnel in the use of the Trunk Radios during emergency situations.

## SUMMARY

This lesson has covered topics related to effective communications, contacting key personnel, and emergency communications. As a RCT, you should be aware of your location and what communication systems are available to you while working on any job or situation.