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RCT: 2.02 COMMUNICATION SYSTEMS

RCT Module 2.02
Course #33339

May 2016

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Overview of Lesson

- This unit will present an overview of communication systems at LANL. Good communication skills are essential to an RCT. RCTs should develop an ability to communicate, using both verbal and nonverbal media. These skills will ensure that important information is transmitted to the proper individuals in a clear and concise manner.

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Terminal Objective

- Given the course material and/or after participating in a live classroom version of this course, the RCT must demonstrate a basic understanding of RCT: 2.02 Communication Systems and its applications by completing the quiz at the end of the course.

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Enabling Learning Objectives

- 2.02.01 – Explain the importance of good communication.
- 2.02.02 – Identify two methods of communication and be able to determine the different types of each.
- 2.02.03 – Describe different types of communication systems.
- 2.02.04 – Describe the FCC and DOE guidelines regarding the proper use of communication systems.
- 2.02.05 – Describe general attributes of good communications.

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Enabling Objectives

- 2.02.06 – Explain the importance of knowing how to contact key personnel.
- 2.02.07 – Identify the communication systems available at LANL and methods available to contact key personnel.
- 2.02.08 – Describe the emergency communication systems at LANL.

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2.02.01 – The Importance of Good Communication

- Good communication is important in everyday life and requires ensuring that our message is
 - Clear
 - Received
 - Understood

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2.02.01 – The Importance of Good Communication

- A message must be clear and concise to eliminate confusion and the possibility of misunderstanding.
- The receiver should be able to understand the communication without unnecessary interpretation or guesswork.
- The sender of the communication must not assume knowledge that is needed for the safe execution of the desired response.

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2.02.01 – The Importance of Good Communication

- Misunderstanding of communication can potentially cause personal, as well as physical damage to equipment and surroundings. This is especially true in emergency situations that require immediate action or response.
- Ensure in all communications that desired responses are not outside the abilities or scope of the individual or group.

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2.02.02 – Methods of Communication

- Two methods of communication:
 - Verbal
 - Nonverbal

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2.02.02 – Verbal Communication

- Verbal methods of communication:
 - Talking directly to another person
 - Telephone conversations
 - Voice mail
 - Video teleconferencing
- Verbal methods generally allow a 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.

2.02.02 – Nonverbal Communication

- Nonverbal methods of communication include
 - Signs
 - Letters
 - Signals
 - Gestures
 - Documents
 - E-mail
- Nonverbal methods can limit the amount of information transmitted due to the difficulty in the transmission method.

2.02.03 Types of Communication Systems

- Types of communication systems include
 - Public Address (PA) Systems
 - Telephones
 - Voice Mail
 - Two-Way Radio
 - Pagers
 - FAX
 - Computer Mail Systems
 - Computer Bulletin Boards

2.02.03 Public Address (PA) Systems

- Typically, loud speakers and calling stations located throughout an area provide audible notification to all personnel within the area.
- May be used for routine messages, contacting groups or individuals, items of interest to the general population, and emergency notifications or warnings.
- Should be administratively controlled to ensure effectiveness in contacting facility personnel and availability during emergency conditions.

2.02.03 Telephones

- Provide a means for point-to-point communication.
- May be considered semiprivate when compared with the PA system; however, when the phone is located at a DOE facility, all calls are subject to monitoring for security reasons.
- Provide communication but are subject to use by other individuals that may impede your contacting the person or persons needed in an emergency situation.

2.02.03 Voice Mail

- The LANL telephone system allows you to leave a voice message whenever the receiving party is unavailable.
- However, you have no way of knowing if the other person received or understood your message, unless you leave a return number and ask for confirmation.

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2.02.03 Two-Way Radio

- Provides a direct link to other individuals on your frequency or net.
- "Traffic" on the radio may impair your message from being clearly understood.
- Subject to interference by outside sources, which may garble or mask the message.
- Provides mobility and access while at remote locations.

2.02.03 Pagers

- Small electronic devices capable of receiving signals from the telephone system to alert the carrier of intended communication from another party.
- Provide access to personnel while away from the work location.
- Some provide only a voice message or phone number to contact; others at LANL allow text messaging.
- Do not allow the carrier to respond directly to the page verbally.

2.02.03 FAX

- Can be used to send or receive a facsimile of a sheet of paper containing typed or handwritten instructions, sketches, diagrams, etc.
- Transmission takes a few minutes, but it may take longer for the message to get to the individual for whom the message is intended.

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2.02.03 Computer Mail Systems

- Provide communication between computer terminals.
- Enable users to contact individuals or groups directly and leave written messages for these individuals to receive.
- Enable users to contact receivers directly, while other users are unaware.

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2.02.03 Computer Bulletin Boards

- Provide communication to anyone with access to the bulletin board.
- The user provides messages or information without knowing who will receive the information.
- Usually messages and information are of general subject matter or routine information that apply to most users.
- Provide a means for communicating with a large, diverse group.

2.02.04 – FCC and DOE Guidelines Regarding Proper Use of Communication Systems

- When using communication systems licensed by the Federal Communications Commission (FCC) and operated by the Department of Energy (DOE), 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

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2.02.04 – FCC and DOE Guidelines Regarding Proper Use of Communication Systems (cont)

...one cannot

- Make unnecessary or unidentified transmissions.
- Transmit without first ensuring 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 that has not been assigned to your station
- Rebroadcast another transmission (i.e., radio station music)

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2.02.05 General Attributes of Good Communications

- Minimize the use of abbreviations and acronyms.
- Make all oral instructions clear and concise. Do not include multiple actions in a verbal instruction that may get confused or misunderstood.
- Ensure that the identity of the person(s) is clearly understood.
- Use clear, precise terminology. Do not use slang terms.

2.02.05 General Attributes of Good Communications

- Use the phonetic alphabet for clarification.

Table 1. Phonetic Alphabet and Numbers

A - Alpha	J - Juliett	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

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2.02.05 General Attributes of Good Communications

- Repeat back messages, either paraphrased or verbatim.
- Speak distinctly and deliberately.
- Acknowledge all communications.

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2.02.06 – Importance of Knowing How to Contact Key Personnel

- It is important to know how to contact key personnel.
- Prompt communications with key personnel enables timely response to routine tasks and emergency situations.
- The ability of the RCT to contact key personnel can reduce personnel injury, equipment damage, uncontrolled radioactive release, unrestricted movement of controlled materials, and other important actions.

2.02.06 – Importance of Knowing How to Contact Key Personnel

- 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 a proper response.

2.02.07 – Communication Systems at LANL and Methods to Contact Key Personnel

- Communication systems available *site-wide* at LANL that are used to contact personnel include
 - Telephones
 - Voice Mail
 - Pagers
 - FAX
 - Computer Mail Systems

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2.02.07 – Communication Systems at LANL and Methods to Contact Key Personnel

- In addition to the site-wide communication systems at LANL, *certain facilities* also have the following systems that can be used to contact personnel:
 - PA Systems
 - Two-Way Radio
 - Computer Bulletin Boards

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RP-SOP-070, *RP Communication Requirements*

- Procedure RP-SOP-070, *RP Communication Requirements*, contains specific communication requirements for RP personnel at LANL.
- Additional communication requirements are included in many RP procedures.
- RCTs will notify their HPFC or Health Physicist for most required communications.

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Required Notifications

Event	Required Notification		
	RCT or HP informs HPFC	HPFC or HP informs TL	TL informs RP- PROG GL
<ul style="list-style-type: none"> Employee sustains work-related injury Assistance is needed to control or respond to an event or condition [continue notifications only until needed assistance is obtained] Known or suspected intake of radioactive material (inhalation, injection, contaminated wound) [for tritium only base on air sample results below] Known or suspect unplanned external dose >100 mrem Unauthorized off-site (outside LANL property) release of contamination or radioactive material 	Immediate ¹	Immediate ¹	Immediate ¹
<ul style="list-style-type: none"> Employee reports non-work related injury High radiation area inadequately posted or controlled Skin contamination Elevated nasal swipes CAM alarm 	Prompt ²	Prompt ²	By the end of shift
<ul style="list-style-type: none"> Elevated air sample results (>40 DAC-h or >1 DAC) Personal clothing contamination Area contamination in a non-controlled area Glovebox glove or window breach 	Prompt ²	Prompt ²	By end of shift
<ul style="list-style-type: none"> Radiation area inadequately posted or controlled Supplemental dosimetry reading >1.5x expected Elevated air sample results(<40 DAC-h or <1 DAC)³ Area contamination in a buffer area Non-contaminated wound in an RCA Protective clothing contamination Clothing is detained for radon decay determination Work is stopped or paused Violation of procedure or requirement Radiological boundaries or posting tampered 	Prompt ²	One hour	By end of shift
<ul style="list-style-type: none"> Changes to radiological posting Any other unusual survey results not listed above 	By end of shift	By end of shift	None

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Required Notifications, Notes

1. Use all available resources to ensure that notification is made, including asking others to place pages/phone calls. Repeat the page if no response is received in 5 minutes. If there is no response after the second page, continue to elevate up to higher levels of management until contact is made, waiting no more than 5 minutes before elevating to the next level.
2. Repeat the page if there is no response in 20 minutes. If there is no response after the second page, continue to elevate up to higher levels of management until contact is made, waiting no more than 30 minutes before elevating to the next level.
3. Report individuals who may have been present without appropriate respiratory protection.

2.02.08 – Emergency Communication Systems at LANL

- The following procedures govern emergency response at LANL:
 - PD1200, *Emergency Management*
 - P1201-4, *LANL Emergency Procedures and Protective Actions*
 - RP-1-DP-11, *RP-1 Emergency Response Plan*

2.02.08 – PD1200, *Emergency Management*

- PD1200, *Emergency Management*, identifies the following responsibilities for all workers at LANL in emergencies:
 - Call 911 for the police, ambulance, or fire department, followed by notifications outlined in the Building Emergency Plan (BEP)—a plan specific to each facility.
 - For all other incidents:
 - call the Emergency Operations Center (EOC) at 667-6211 and the appropriate RLM in accordance with the local BEP;
 - follow the BEP and other facility-specific emergency procedures.

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2.02.08 – P1201-4, *LANL Emergency Procedures and Protective Actions*

- P1201-4, *LANL Emergency Procedures and Protective Actions*, provides requirements and guidance for LANL workers in the event of an emergency event or situation. It identifies the protective actions to be followed in the event of a hazardous material release, fire, or other emergency event.

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2.02.08 – P1201-4, *LANL Emergency Procedures and Protective Actions*

- Protective actions addressed in P1201-4 include
 - Building Evacuation
 - Evacuating Workers with Special Needs
 - Evacuating Visitors
 - Site-Wide Evacuation
 - Security during an Evacuation
 - Shelter in Place
 - Stay Put Sheltering
 - Lock Down/Hide Out
- These actions are addressed in detail in BEPs and facility-specific training.

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2.02.08 – P1201-4, *LANL Emergency Procedures and Protective Actions*

- P1201-4 provides emergency events response guidelines for the following:
 - Bomb Threat
 - Earthquake
 - Fire, Smoke, Explosion
 - Hazardous Material (Chemical, Biological, or Radiological) Spill/Release
 - Lightning
 - Power Outage
 - Unattended Package or Unexploded
 - Workplace Violence/Active Shooter

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2.02.08 – RP-1-DP-11, *RP-1 Emergency Response Plan*

- RP-1-DP-11, *RP-1 Emergency Response Plan* defines the requirements for RP personnel responding to emergencies.
- RP personnel will perform only those emergency response actions for which they are properly trained and qualified, in accordance with RP-1-DP-11 and associated facility-specific procedures.

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2.02.08 – RP-1-DP-11, *RP-1 Emergency Response Plan*

- RP-1-DP-11 provides the following requirements for RP Emergency Response:
 - Ensure that all personnel are evacuated from the area.
 - Make the following initial notifications, as appropriate:
 - 911
 - RP supervision (HPFC, HP, or RP-PROG management).
 - Note: If you call 911 on a cellular phone, identify your location as Los Alamos. You will be transferred to the Los Alamos 911 operator.

2.02.08 – RP-1-DP-11, *RP-1 Emergency Response Plan*

- Monitor personnel exiting the area for contamination as appropriate or as specified in BEPs.
- Be prepared to assist emergency response personnel with information concerning radiological conditions or to monitor radiological conditions as necessary for emergency response personnel entering the area.

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2.02.08 – Emergency Communication Systems at LANL

- For further guidance in responding to radiological emergencies, refer to the following RP procedures:
 - RP-SOP-012, *Responding to Suspect Internal Intake*
 - RP-1-DP-13, *Responding to an Exposure Exceeding Administrative Control Levels*
 - RP-1-DP-16, *Responding to Radioactive Material Spills*
 - RP-SOP-015, *Responding to External Personnel Contamination*
 - RP-SOP-014, *Responding to CAM Alarms*
 - RP-1-DP-17, *Responding to ARM Alarms*

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