

Radios and bullhorns may be effective in emergency communication, if background noise does not prohibit their use.

The ability to rapidly and effectively communicate is essential for worker safety in hazardous waste operations, construction sites, and in other types of workplaces. Communication while wearing respirators can be extremely difficult, especially in situations with considerable background noise.

For hazardous waste operations, the federal Occupational Safety and Health Administration in 29 CFR 1910.120 and 1926.65 requires employers to establish site communication procedures, including the means to alert personnel in the event of an emergency. All too often, health and safety plans may require emergency hand signals but provide very minimal guidance. The plan may list a few examples, such as the hand signals listed in the NIOSH/OSHA/USCG/EPA guidance manual (e.g., hand clutching throat means "out of air"). Very often, crews will have to establish their own hand signals and may or may not effectively use them. A new employee joining the crew may not understand the signals and may be placed at risk.

In order to establish uniform guidance in site communication for hazardous waste operations, the authors researched available literature, and drawing on experience, have developed the following communication protocols.

Signal	Meaning
Point index finger toward self	I/me
Point index finger toward object	It/them
Point index finger toward person	You/them
Circle index finger at group	We/us/all of us
Beckon with index finger	Come here
Point with thumb in a particular direction	Move this way/go this way
Bring index finger across throat	Quit
Slowly ease palm face down	Relax/slow down
Put palm over brow	Scout it out/check it out
Move hand far away from body	Stay away

Put fist in air	Stop/hold position
Hold index finger up near head	Wait
Hands on top of head	I'm OK
Thumb up	Good/OK
Thumb down	Bad/not OK
Slap forehead	Bad idea
Palm down and rotated from side to side	Unsure/can't decide
Wave goodbye	Goodbye
Form a circle with thumb and index finger	OK/I understand/agree
Military salute	I understand and will comply
Shake head from side to side	No/disagree
Shake head up and down	Yes/agree

Emergency Signals

Emergency signals are necessary to alert workers of danger and to maintain site control during emergencies. Compressed air horns ("sport horns") are the most common emergency signaling device in hazardous waste operations.

Radios and bullhorns also may be effective in emergency communication, if background noise does not prohibit their use. Emergency hand signals should also be developed as a secondary means of communication.

The following list of signals is suggested for emergency communication:

Signal	Meaning
One long blast on air horn/siren/whistle	Evacuate area
Two long blasts on horn/siren/whistle	All clear
Hands on top of head	I'm OK
Strongly wave arm(s) over head	Help/need assistance
Cross arms in front of head, fists closed	Stop/stay away

Point one arm in direction of evacuation, make large circling motion with other arm in direction of evacuation	Evacuate area
Hand clutching throat	Out of air/can't breathe
Grip partner's wrist or waist	Leave area immediately

Signals for Vehicle Operations

A variety of communication signals have been developed for assisting vehicle operators. The American National Standards Institute and OSHA (in 29 CFR 1926.550) have published standard hand and body signals for crane operations. Personnel involved in these types of operations are referred to the standard and regulations for signal descriptions.

Other vehicle signals have been developed by the American Society of Agricultural Engineers, various fire departments, governmental agencies, trade associations, and contractors.

The most common signals are summarized below.

Signal	Meaning
Move arm in circular (cranking) motion at waist level	Start engine
Move hand, palm down across throat	Stop engine
Circular motion with hand pointing to ground	Lower equipment
Circular motion with hand pointing up	Raise equipment
Palms in front of head at ear level, moving laterally to indicate distance to go	This far to go
Point to vehicle, beckon with arm motioning toward body	Come toward me
One hand above head, palm toward face, waving back	Move straight back
Both arms pointing in same direction, index fingers extended	Turn (direction indicated)
Put fist in air or cross arms in front of head, fists closed	Stop
Thrust fist upward from shoulder and downward to shoulder several times	Speed up
Extend arm sideways, palm down, and wave arm downward 45 degrees several times	Slow down

Radio Communication

Radio communication is commonly used, especially when crews are working at remote locations. Personnel should be instructed in the use of the particular radio, which channel(s) should be used, and in radio protocols. They should be instructed to speak clearly and use the radio only for necessary work-related communication.

All employees must give absolute priority to emergency communication

The following guidelines should be provided to the radio users.

- Before transmitting, listen long enough to make sure the channel is not being used.
- Call the name or call sign of the individual or unit you are trying to reach and then identify yourself (e.g., "Backhoe One, this is Safety.>").
- Wait for further transmission until acknowledgment is received (e.g., "Safety, this is Backhoe One.>").
- Proceed with your transmission. When finished, say "Over" when a response is expected or "Out" when the transmission is complete and no response is expected.
- An employee receiving a radio call must acknowledge the call immediately unless doing so would interfere with safety.
- If a transmission is incomplete or not understood, request clarification.
- A phonetic alphabet (see Table 1), should be used to pronounce letters clearly.
- Emergency calls should begin with the words "Emergency, Emergency, Emergency." All employees must give absolute priority to emergency communication. Unless they are answering or aiding the emergency call, employees will not use the radio until they are certain they will not interfere with further emergency communication.
- Radios will be charged and tested prior to each work shift and as necessary thereafter. Malfunctioning radios must not be used and must be replaced immediately.
- Employees must not transmit false information or unidentified communication.
- Profanity and indecent language are prohibited. Sensitive information will not be transmitted over radios.

Table 1. Radio Alphabet

Letter	Word
A	Alpha
B	Bravo

C	Charlie
D	Delta
E	Echo
F	Foxtrot
G	Golf
H	Hotel
I	India
J	Juliett
K	Kilo
L	Lima
M	Mike
N	November
O	Oscar
P	Papa
Q	Quebec
R	Romeo
S	Sierra
T	Tango
U	Uniform
V	Victor
W	Whiskey
X	X-Ray
Y	Yankee
Z	Zulu

