

Crane Signaling Awareness

The person directing lifting operations (**Lift Director**) is ultimately responsible for the crane's work. The **crane operator** manipulates the equipment controls. The **signal person** directs crane movements using hand or voice signals. Only one person should give signals, except emergency stop, which anyone may give.

Crane signalers help crane operators avoid obstructions. The operations that crane signalers direct can affect crane capacity and the swing of the load. Operating crane safely truly is a team effort!

Effects of Crane Movement

Capacity: The boom and radius must be as short as possible to lift the maximum weight. Changing the crane position and extending the boom length and/or radius will decrease the capacity of the crane.

Dynamic Loading: Heavy or fast-moving loads take more time to stop than light or slow-moving loads. Signalers must give advance notice so that operators may stop loads gradually and safely.

Boom Deflection: Boom deflection means that as you apply lifting forces on a load, the boom bends down slightly. The rigging must be pulled tight and the boom must deflect completely before the load leaves the ground. When lowering the load, the signal person must ensure the boom is NOT deflected before it's safe to detach the load.

Stuck Loads: Lifting loads that are stuck can strain the crane or cause sudden movement that can lead to damage or tip-overs. Signalers must let crane operators know when they are trying to lift a stuck a load so that the operator knows what to expect.

Multiple Functions: Some cranes are unable to perform boom and hoist functions at the same time smoothly or safely. The signaler and operator must understand equipment limitations and plan accordingly.

Two Blocking: Two blocking occurs when the headache ball or hook block contacts the boom tip. It is especially common on telescopic boom cranes when telescoping the boom.

Side Loading: Side load occurs when the center of gravity of a load is not directly under the crane hoist. Too much side load can cause the boom to collapse.

Methods

Crane signalers communicate with crane operators using clear and constant standardized hand signals and voice commands. Prior to beginning operations, the team will meet to:

- Review the work plan and hazards
- State the crane capability/limitations
- Identify each other
- Agree on signals/commands

Hand Signals

Hand signals require:

- Positioning (same side of boom as operator)
- Visibility (distance, weather, light, etc.)
- Exact delivery

Voice Signals

Voice signals require:

- Tested systems (clear, reliable, dedicated channel, hands-free for operator)
 - Free of interference
 - Will not detonate remote explosives
- Clear, slow, deliberate words
- Directions given from the operator's perspective (operator's left/right)

Voice signals begin with an identifier when there is more than one crane. The signaler must then deliver voice commands in this standard order:

1. Function and direction.
2. Distance and/or speed.
3. Function stop.

Example: "North crane, swing right 10 meters. 5 meters...4...3...2...1. Load stop."

IMPORTANT: Anytime the operator cannot see, hear or understand the signaler, work should immediately stop.

Resources

Before work begins, a designated person will test signalers to make sure they have a basic understanding of crane operation and limitations and know standard hand/voice signals. **Hand signal charts** should be posted on the equipment or in the vicinity of hoisting operations.

Communication Barriers

Weather/Vision. Rain, fog and dust can impede the crane operator's ability to see a hand signaler. Wind can muffle radio operators' voices. The glare of the sun at certain positions may make it difficult for crane operators and signalers to see each other. Check forecasts and consider how weather and visual impediments may impact communications. Discuss these issues prior to beginning the work.

Language/Speech. If a voice signaler has a strong accent or speech impediment, it's important to ensure that the crane operator can clearly understand him or her. Consider using hand signals instead, if language or speech could cause confusion.

Interference. Other radio devices and lightning can cause radio interference. Hand signalers in busy areas may be distracted. It's important to test equipment and make everyone on the site aware of where signalers are located so that they can avoid distracting them or using devices that may interfere with their equipment.

Decisiveness/Confidence. If something doesn't seem right, people need to speak up and alert others to potential issues. Signalers must be able to make decisions with confidence and stop work, if needed. Signalers without these qualities can put people and property at risk.

Stop Work

EVERYONE has the responsibility and authority to stop work if they feel that unsafe conditions are present or if they do not understand directions.

The signal for an emergency stop is to extend both arms horizontally with palms down. Then, swing the arms back and forth.

The voice and hand signals for stops and emergency stops should be part of the pre-work briefing.

ANY interruption in communication between the crane operator and the signaler should result in an immediate stop.

The operator should stop crane movement to communicate or obtain clarification from the signal person, as needed.