

Signal failure

The absence of safe, universally accepted methods of verbal communication between crane operators and banksmen is causing concern in the US, as Richard Howes discovers



A crane accident can cause death and destruction on a frightening scale. That makes comments made by Jeff York, president of US-based operator assistance company Signal-Rite, LLC, even more concerning. He believes there could be devastating consequences if formal verbal communication directives are not introduced to the industry.

Such is the extent of his concerns that he has designed his own signals for tower and mobile crane operations. York says he has sold upwards of 50,000 rigging reference cards, 100 videos and seen his signals used by around 100 contractors. He hopes that one day they will become standard on a far greater scale.

Standard hand signals are no secret. They can be found in title 8 CCR, ASME (American Society of Mechanical Engineers), and the ANSI (American National Standards Institute) series. But

York asks: "We have standard hand signals available, why not standard verbal signals?" He adds: "This is a big problem which has been overshadowed by the inception of NCCCO [National Commission for the Certification of Crane Operators]."

York has experience across the lifting industry and has seen both good and bad practice on a range of sites including bridge construction, power development, refinery maintenance and crane rental.

He has proposed to the US Occupational Safety and Health Administration (OSHA) that the deficiencies in both the State and Federal Register be addressed to better ensure clear and safe verbal interaction between a crane operator and a banksman supervising the delivery or removal of a load.

Both the Californian branch of OSHA (CalOSHA) and US Naval Operations have studied crane accidents and broken them

down by type of crane, and contributing causes of groups at fault. This study produced consistent numbers in the communication category. Many of these types of accidents could be eliminated by standardising verbal crane signals and licensing the signal person or rigger.

York says his concerns have been echoed by the industry across the globe, certainly in Europe - where he reckons the problem is also apparent. Even where guidelines are given, says York, they are not properly adhered to.

York recalls some worrying memories. "When we were lucky," he says, "we worked with a seasoned signal person. But more often than not, we worked with someone who had little, if any, experience working with cranes."

York adds that each trade has made up a different set of signals that seem to make sense to them, leaving him and his colleagues unsure of what they wanted the crane to do. Guess work when operating a crane can have hazardous

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**Jeff York, president
 of Signal-Rite**

Jeff York's verbal signals for each motion of a crane. The desired actions are on the left of the vertical line, and the suggested words to communicate that action are to the right

Verbal Crane Signals (Conventional Cranes)					
Hoist		Boom		Swing	
Fast	Up Up	Fast	Boom Up	Fast	Swing Right
	Up Easy		Easy Boom		Easy Swing
Stop	High	Stop	Boom	Stop	Swing
Fast	Down Down	Fast	Boom Down	Fast	Swing Left
	Down Easy		Easy Boom		Easy Swing
Stop	High	Stop	Boom	Stop	Swing
Travel		Hooking / Unhooking From A Load			
Fast	Travel Forward	Up To Choke Down To Cut Loose			
Stop	Easy Travel				
Stop	Travel				
Travel					
Fast	Travel Backward				
	Easy Travel				
Stop	Travel				
Adjustments in Speed can be made with one word commands.					
Faster or Slower					

consequences.

The standard listed below is from Cal-OSHA title 8 CCR (California Code of Regulations):

(a) A signal person shall be provided when the point of operation is not in full and direct view of the operator unless a signaling or control device is provided for safe direction of the operator.

(b) Only qualified persons shall be permitted to give signals.

(c) A uniform signal system shall be used on all operations and if hand signals are used, they shall be clearly understood by the operator.

(d) Signal systems other than manual shall be protected against unauthorized use, breakage, weather or obstruction, which will interfere with safe operation. In the event of any known malfunction, an alternate signal system shall be used or all motion shall be stopped.

(e) There shall be conspicuously posted in the vicinity of the hoisting operations, a legible chart depicting and explaining the system of signals used.

As you can see, it states that only qualified persons shall be permitted to give signals. "Currently under title 8 CCR there is no standard verbal signal system that has ever been established," says York. He has made enquiries and discovered that there has never been a citation given over section (b). "I also have a problem with section (e) -" he adds, "a legible chart depicting and explaining the system of signals used, conspicuously posted in the vicinity of the hoisting operations. Would that be verbal or hand signals?" Are crane signals clearly posted for all to view on your jobsite?

York says the signalperson has no clearly defined responsibility for his or her actions under the current standards

in the US. When the operator is working in the blind, they are completely dependent upon the signalperson.

"Some contractors," says York, "often designate signal persons who are not qualified in the important task of signaling cranes." He says he can recall many times during his 23 years of operating cranes when he has had to stop an operation because of a signaling or communication issue which the contractor was oblivious to.

"This," he continues, "is a clear violation of the standard - but it is, worryingly, common practice." He adds: "The crane is usually the most expensive piece of equipment on the job as well as the one capable of doing the most damage. It is time to have certification for signalpersons and riggers as well as operators. Training, testing and enforcement of the standards would make for safer and more productive working conditions."

York recalls that his patience finally broke over verbal signals during the construction of the New San Francisco Oakland Bay Bridge project. The construction of the bridge reached a milestone early this year when the first transition span, linking the concrete Skyway bridge deck section with a yet-to-be-built suspension bridge, was lifted into place using alternative lifting technology. (*Cranes Today* January, p. 9). York explains that part of the problem was that many of the piledrivers had never worked with a tower crane or a two-way radio .

There were 300 two-way radios on the job and York says it was always a surprise who was going to signal the crane next. "I could not take it any longer," he says. He went straight to his

supervisor and aired his gripe who took it up the chain of command. He came back to York asking him to write the signals down on paper so they could be made into placards for the 15 tower cranes on the project. York pointed out that they were in fact in violation of Title 8 CCR and the conditions of the operating permit issued to them by (CalOSHA).

The Signal-Rite training video was thus born and was used by the contractor to try to get everyone to comply with the signals. York admits that it was a case of perseverance but an improvement was noted. "From reports that I have received from the jobsite there has been a substantial improvement," says York.

York says the reason these signals are superior to any other verbal method is because they are simplistic and self explanatory. "We use one word commands," he says. York points out that this makes it easier for the workers who do not have a good grasp of spoken English. "It also promotes good radio etiquette by allowing the operator to speak if needed," he adds.

York believes that by leaving the distance factor out of the equation and using the speed method removes the possibility of most errors. Says York: "Everyone understands if they are going too fast or too slow. If this is unclear, ask 10 people to give you an estimate of a known distance and see how many different answers you receive."

You will notice that the word stop is not used in York's signals. "Stop," he explains, "sounds like up if the radio is miss-keyed, thus inviting an accident to happen over miss-communication."

Instead, York recommends the use of the word "high" be used as the function stop for the hoist. The reaction time of the operator is significantly reduced by removing unnecessary verbiage from the system. He says a brief description of where the load is going prior to lift will eliminate the need for extra verbiage while signaling, which, in his opinion, reduces the reaction time in the event of an emergency stop.

York says he has proven 30% increases in productivity where these signals have been used and adhered to.

He is still at the onset of a journey to get his signals introduced as standard. "More importantly," he says, "I want the personnel we work with to be licensed and qualified just like the operator, which will make for safer working conditions for all." He concludes that standard verbal crane signals should be entered into all standards, and finally put an end to the confusion - and danger - that a crane operator is subjected to on a daily basis.