

## Keeping Hoists and Cranes Safe

*ECMA develops standards that help make overhead cranes and hoists operate more safely.*

BY MICHAEL FICKES

**M**embers of the Electrification and Controls Manufacturers Association (ECMA) manufacture and market devices such as radio remote controls, adjustable frequency drives and a host of additional control equipment.

As an association, ECMA develops codes, standards and training materials that promote the safe operation of overhead cranes and hoists.

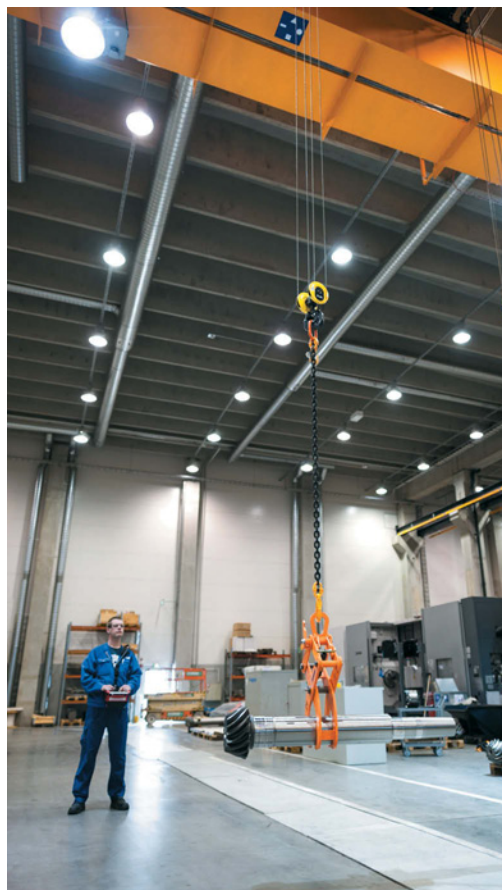
### The cable-less specification

The association began developing these materials at the request of the Crane Manufacturers Association of America (CMAA). When CMAA was re-working its crane and hoist specifications, the group asked ECMA to develop a radio control specification. Radio control had not been previously addressed. By the mid-2000s, however, radio control technologies had progressed to the point where their use was becoming common, and CMAA believed specification standards were needed to help ensure safe equipment operation.

“The engineering committee of CMAA has asked ECMA to develop specifications for radio controls and adjustable frequency drive controls,” explains Dan Beilfuss, director—sales with Magnetek, Inc.

“We introduced the radio specification in 2010,” continues Beilfuss. “This is ANSI ECMA 15:2010, entitled ‘Specifications for Cable-less Controls for Electric Overhead Traveling Cranes.’”

The standard itself explains its purpose as providing “information regarding the governmental requirements, safety benefits and applications for radio frequency directional devices used in controlling the movements and actions of electric overhead traveling cranes in material handling applications.”



A warehouse employee uses a radio controlled KoneCrane to position materials in a distribution center. The radio control was designed to the ECMA specification standard.

By movements, the standard refers to the up and down movements of hoists and the three kinds of motions that cranes provide—up and down; left and right; and forward and reverse.

What safety concerns do radio controls raise? “When you energize and de-energize a piece of equipment using a radio control, it’s important that the operator maintain full control,” says Beilfuss. “Radio control safety measures prevent un-commanded motions. They also shut equipment down in an emergency. For instance, the radio standard has an emergency stop feature—a lever that turns the crane or hoist off when the operator lets go of the controls.”

Finally, the radio standard also covers federal regulations

governing the use of radio frequencies as well as environmental regulations related to battery use and disposal.

## The variable speed drive specification

ECMA is currently working on ECMA 25, entitled ‘Specifications for AC Inverters for use on Electric Overhead, Monorail, and Gantry Traveling Cranes.’ This spec will go through the formal ANSI review process and is scheduled for release in 2015.

Variable speed drive, adjustable-frequency drive and adjustable speed drive are alternative names for an inverter drive.

“Adjustable-frequency drives, or AFDs, control the motors that power hoists and cranes,” says Beilfuss. “These drives turn crane and hoist motors on and off, accelerate and decelerate the motors and make them run faster and slower. The drives enable smooth operation, which prevents damage to the components of the hoists and cranes as

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– Dan Beilfuss, director – sales, Magnetek, Inc.



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well as to the materials and equipment being moved.”

Adjustable-frequency drives are called inverters because of the way they manipulate alternating current. When alternating current from a power source flows into an inverter, a series of diodes converts the alternating current to three pulses of positive direct current and three pulses of negative direct current.

Next a series of transistors acting as on off switches inverts the direct current, transforming it back into alternating current. The inversion process is where the device gets one of its names—inverter drive.

The other names—adjustable speed drive and adjustable frequency drive—arise from the fact that the device can raise and lower the frequency of the inverted alternating current. The higher the frequency, the faster the motor runs; the lower the frequency, the slower it runs.

In this way, an inverter enables hoists and cranes to move faster and slower, with smooth acceleration and deceleration.

“The ECMA standard, a new standard, will address the operational and safety characteristics of inverters,” Beilfuss says. “Specific issues include the requirements for braking control of the drives.

“Two examples: When the crane is de-energized, all motion commands will cease. If the operator inadvertently presses two control buttons, giving the device different directional commands at the same time, the drive will not activate the crane.





“The standard will also include general installation recommendations for proper ventilation and other environmental specifications such as temperature, humidity and proper cooling.”

### Promoting safety

When a standard is completed, it is adopted and written into CMAA specifications.

ECMA members also sell the published specifications to the industry along with equipment designed and manufactured to the standard’s specifications. In addition, the ECMA committee that developed the specifications meets twice each year to work on enhancements and clarifications.

“We also participate in trade shows to get work out to the industry and end users about the specifications,” Beilfuss says.

In this way, ECMA is helping to standardize operating principles for advancing hoist and crane technology that will help keep operators safe and the equipment they are handling undamaged. ●

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