Crane Simulators as training tools

A review of features and capabilities

BY DAVE RITCHIE

Crane simulators are more than just fancy video games; they can be valuable training tools for crane operators. Recently, I was given the opportunity to test drive a simulator, and I was impressed with its features and training capabilities. Advances in software technology have made crane simulators an effective and cost efficient training tool for contractors. The simulator I tested has six modules or types of work: two are designed to teach basic crane maneuvering skills while the others cover load placement, steel erection, concrete bucket and form following with bucket. Joysticks did not come with the software but are available for an additional cost.

The joysticks are stepless, meaning they do not have clicks or notches like most tower crane controls. While the manufacturer did say that steps do exist in this simulator program, I was unable to detect them. However, under the options menu, the user can select frequency control drive on the trolley function. Newer tower cranes using frequency control drives do use the step less controls. Users who want steps in the controls may have to purchase a control desk and have it connected to a computer.

The product I tested comes on a CD-rom and runs on a personal computer. My monitor is a 19 inch extra sharp flat screen and I was very pleased with the way the display appeared, but the manufacturer said the display works even better when using a LCD projector and screen.

While visibility is limited to two dimensions, the software uses dots or shadows on the ground or building under the load to add the appearance of the third dimension. In addition, the machine gives a computer readout of swing angle, radius and hook height, which are similar to Liebherr's Litronic system. The user has the capability of looking up or down, and right or left, using a button on the joystick. The ability to adjust the view in this manner adds significant realism. If the user pans the view up so the jib can be seen and then trolleys the load out, the jib will deflect down just like a real tower crane. The hoist gear can be changed just like a real crane, and if the user selects a gear that is too high, the hoist becomes disabled. In addition, if a heavy load is trolleyed out too far, load limits shut down appropriate machine functions.

Several changes and alternatives are available under the options menu. Graphics can be adjusted down to suit a particular computer's capabilities, but more important is the fact that the responsiveness or sensitivity of machine functions can be changed. I found this to be a valuable capability, especially because the simulator does not take into account tower torque or twist. Most experienced tower crane operators will find the swing function too responsive and will be more comfortable with the simulator if the sensitivity is adjusted downward.

Using this simulator will not make a journeyman out of an apprentice. However, I do think it will improve the skills of an apprentice. Also, it can help crane operators prepare for certification. The simulator's various modules are focused on the tasks required on the NCCO practical exam. The software does not duplicate the practical exam; however, it does test similar skills.

One variable missing from the simulator is the effect of wind on the crane. Adding wind would make the simulator an even more realistic and effective training tool.

Finally, one interesting side benefit of purchasing a simulator for training is that it provides management personnel with an opportunity to try their hands at operating a crane using the software. Management may very well find a new appreciation of the skills and knowledge it takes to operate a crane safely. **CW**

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