

## NEWS

### MOTION CONTROL + POWER TRANSMISSION

#### SERVOS

## Making Waves

*Moog's integrated servo motor/linear actuator assembly cuts size and cost in water wave application*

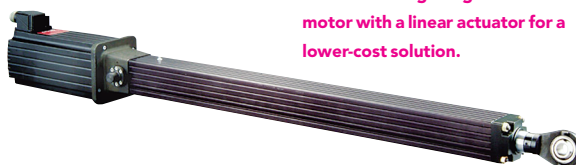
South Korea, like other seafaring countries, maintains large rectangular basins for testing the abilities of ships, drilling rigs and other structures to withstand the power of ocean waves, whether offshore or nearshore.

Segmented water wave generators, installed on one or two sides of a basin, are designed to simulate various wave conditions on the ocean surface. The segments—paddles approximately 1.5m high and 0.5m wide—can be individually controlled

to affect wave height, length, and frequency, and thus create whatever multidirectional wave activity is desired.

W.R. Davis Engineering (Ottawa, Ontario) developed an 88-segment directional wave generator system in 1990 for the Taejun, South Korea-based Korea Research Institute of Ships and Ocean Engineering (KRISO).

"When KRISO decided to expand its system by an additional 54 segments, we had to match the original



**COMBO:** Moog integrated a servo motor with a linear actuator for a lower-cost solution.

hardware/software configuration as closely as possible," explains Davis' electrical engineering manager, Ian Jeffrey.

In KRISO's application, precision wave control depends largely upon an electromechanical actuator system that, in the original design, consisted of an electric motor mated to a ball screw and linear slide rail assembly.

Davis quickly learned that purchasing new actuators from the original vendor would be prohibitively expensive. After evaluating proposals

from several vendors, the Davis design team settled on an actuator solution from Moog Inc. (East Aurora, NY).

"The conventional approach to designing an electromechanical actuator is to get separate components—a motor, with or without a drive, and an actuator—and put them together," explains Moog design engineer Shun Ohara.

In contrast, Moog has integrated a servo motor with a linear actuator. As a result, says Ohara, Moog can deliver a smaller, lighter weight and lower cost electromechanical actuator from its MaxForce 884 EMA series that is more than capable of meeting Davis' and KRISO's stringent requirements.

Ohara says Moog's servo motors were originally designed for military applications requiring small size and high power density. At KRISO, the compact servo motor design and integrated actuator together enabled Moog's 5-inch square motor to do the work of the larger units already installed. Moog's 85-mm x 85-mm actuator now operates alongside older actuators measuring 193 mm x 165 mm.

"By integrating the servo motor and actuator we eliminate the need for the couplings in a conventional design that connect the motor and

actuator together," Ohara adds. "That helps lower weight and costs."

Davis' Jeffrey estimates overall cost saving from deployment of the integrated unit at approximately 25 percent. He adds that the Moog assembly simplifies installation and maintenance. "All we have to do is bolt down one end, then the other," he says. "If we hadn't gone with the Moog solution, we would have paid more, and had to do more on-site work."

"Our client was nervous that Moog's motor wouldn't be big enough," Jeffrey adds, "but it exceeds our specifications."

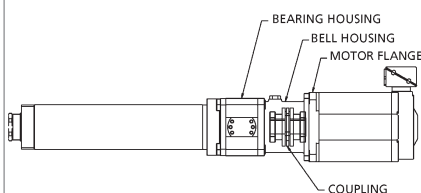
Moog's Ohara explains that his firm customizes its products for each application, matching the available power supply with speed and torque requirements.

"At the outset, in order to provide an optimum solution, we need to understand everything we possibly can about the application, such as duty cycle, load and peak power requirements. We normally gather all of that data ourselves, but in this case, Davis is extremely knowledgeable and provided us with everything we needed," Ohara says. —John Day

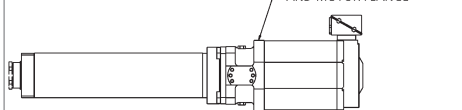
## MOOG

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CONVENTIONAL DESIGN



COMBINED BEARING HOUSING AND MOTOR FLANGE



MOOG INTEGRATED DESIGN

**SIMPLER APPROACH:** Moog's electromechanical actuator combines bearing housing and motor flange, eliminating the need for couplings.