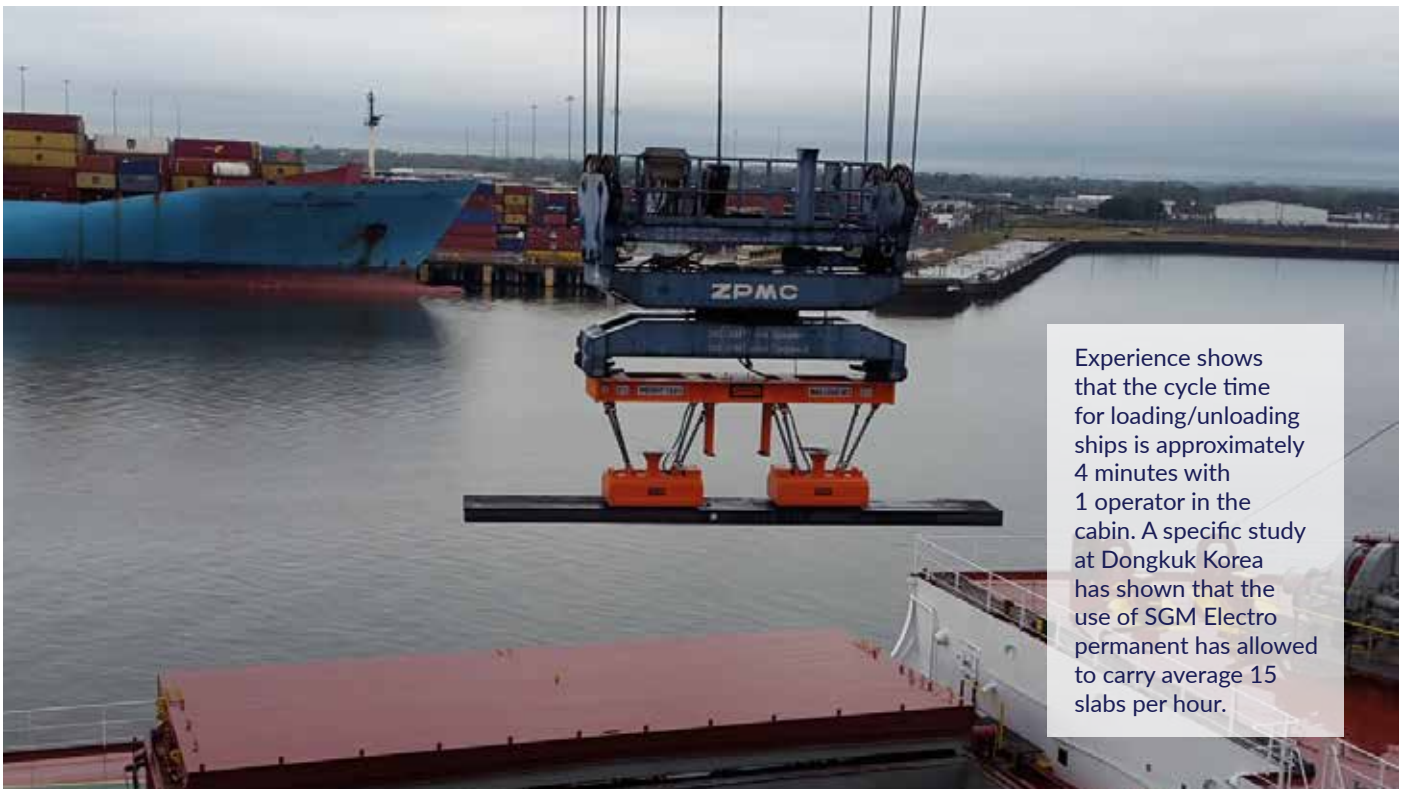


ELECTRO PERMANENT MAGNETS

Slabs



Experience shows that the cycle time for loading/unloading ships is approximately 4 minutes with 1 operator in the cabin. A specific study at Dongkuk Korea has shown that the use of SGM Electro permanent has allowed to carry average 15 slabs per hour.

SOME REFERENCES



Slabs



SAFETY

Resulting from the combination of the SGM electropermanent technology and the SGM safety monitoring device FMD.

The lifting force of the Electro-permanent magnets is independent from external energy sources = no accidental drops of the load as a result of power failure or cable interruption. The lifting force of the Electro-permanent magnets is constant in time = no accidental drops of the load as a result of a reduction on magnet lifting force.

Prior to every lift, the SGM patented Flux Measuring Device FMD checks the lifting safety conditions under which the electro-permanent magnet is working (contact conditions between surface of the load and magnet polarities).

No need for operator to get in contact with or stay by the slab. Magnet system can be operated from a safe distance using radio control or from crane cabin.

No need for slings or clamps.

Technology of the electro-permanent magnet controllers facilitates the creation of safety redundancy.

Special recommendations for the use of electro-permanent magnets is made for locations where sudden interruptions of main electrical power may happen inadvertently.

PRODUCTIVITY

Typical average time per shift for moving a slab is 4 minutes with only one person in the operator crane cabin and one person inside the vessel.

At Dongkuk- Korea, the use of SGM electro-permanent magnets permits the carrying out of 15 slab loading operation in one hour, giving an average of 300 tons of slabs stowed on board each hour.

Required just a few seconds to grip and release a slab.

Wooden spacers between slabs are no longer necessary (gain of time and money).

Unlike electro-magnets, electro-permanent magnets do not generate heat when energized which means that they do not impose limitations on duty cycle.

USER FRIENDLY

The electronic controllers for electro-permanent magnets are technologically less sophisticated than the ones for electro-magnets.

This, combined with the fact that unlike electro-magnets, electro-permanent magnets do not generate heat when energized, makes the electro-permanent magnet technology easier to maintain.

No need for battery back-up.

Electronic controller able to work in local or remote mode with a simple transfer of data and interface with other system (diagnostics).

