

# HOW TO POWER NAVIGATION LOCKS WITH ELECTRICITY

by

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## ABSTRACT

The Air Lift Lock is a device that is made of steel. The device is used to raise the water level in a navigation lock; such that electrical energy provides energy to raise the ship in the lock. This device is used to convert electrical energy into the hydropower needed to operate the navigation locks. On the Panama Canal, the addition of electricity as supplemental energy to canal operations would allow the Canal to exploit the traffic demand without the limits imposed by the availability of water. Also, the availability of potable water to the population would be guaranteed.

With the retrofit of the Panamax Locks working in full coordination with the device, we will witness a promising ratio of annual revenues to investment costs. The design of the device, for this retrofit, is advanced to size the components and estimate costs. The device is parallelepiped with a square top and bottom, 3.50 m wide, and rectangular sides 11.00 m long. The device expands, 8.61 m, in a telescoping manner. The device is installed below the floor of the lock chamber to cover the floor like a tile. The device is expanded by a hydraulic piston 0.60 in diameter. The operation of the device is based on three fundamental principles - the First Law of Thermodynamics, Archimedes Principle and Pascal Principle.

## KEYWORDS

Navigation locks, electricity, Panamax Locks, hydraulic power, new technology.

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