

WATER AT SEA

**By
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Water; water every where, but not a drop to drink. Fresh water at sea is a most precious commodity. All mariners must plan for water on all voyages.

On large cruise liners with thousands of guests and crew, water handling is critical to the success of the voyage. For example, let's take a liner of 965 feet; it displaces 92,000 tons with 1974 passengers and at least another 400 as crew, making water management a prime concern. On average, 290,599 gallons of water are used daily.

This fresh water is supplied from two sources. The first is in on-board storage tanks with a capacity of 845,000 gallons. The second source is converting sea water to freshwater. The ship can convert 474,000 gallons daily. This is done by distillation. The water is evaporated leaving all salts behind, then condensed back to its liquid state.

The trick to this process is to get the water to evaporate at a lower temperature than normal. Water boils at 212 degrees Fahrenheit normally. If the air pressure is lowered it will boil at a lower temperature. On board ship, the air pressure inside the evaporators is lowered to 11.89PSI. Normal air pressure at sea level is about 14.5 PSI. Ambient atmospheric air pressure is constantly changing. We have learned to predict weather by the change in air pressure.

How used water is moved and handled at sea is quite different than on the land side. On land all used water is collected in drain pipes and these are all slanted to allow gravity to move the used water through the pipes. At sea slanting the pipes is almost impossible. The ship movement changes the slant all the time. The distance the used water has to travel on these large ships does not allow for slanted pipes to be effective. Instead, a vacuum system is used. It works at 7.25 PSI to suck the used water for collection.

Waste water is treated and aerated through tanks causing a breakdown of the matter. When they are underway, proceeding at a minimum of 6 knots and at least 12 nautical miles from shore, they can discharge the treated waste water. However, most used water is recycled and used for other purposes, such as washing down the ship to remove accumulated salt. Some ports do have facilities to handle waste water and it is discharged there when possible.

At some ports fresh water is available. The water is tested before it is brought onboard. Water onboard is regularly tested.