

Q&Q with Steve Candito, CEO of Ecochlor, Inc. bringing to market a Ballast Water Management System that uses Chlorine Dioxide to Disinfect Water coming onto Ships and allows Shipowners to meet IMO and US Coast Guard Regulations



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CEOCFO: Mr. Candito, what is the concept behind Ecochlor®, Inc?

Mr. Candito: Ecochlor is a ballast water management system manufacturer. As most of the industry knows there are both international regulations such as the IMO (International Maritime Organization), and US Coast Guard regulations that require ships to have these systems on board now to prevent the spread of invasive species. Compliance from these two regulatory agencies will require significant shipowner resources, as many shipowners and their technical

personnel now realize the futility of buying low cost, deficient systems when full functionality is expected by Port State Control. Ecochlor offers the best system on the market to shipowners looking for ease-of-mind when their ships are inspected for compliance.

CEOCFO: Would you explain ballast water?

Mr. Candito: Ballast water is water that ships pump on and off depending on whether it has cargo on board. The ballast water ensures that the ship is properly positioned in the water; both from an up and down perspective as well as side -to-side. As you can imagine, when you load or unload cargo that has significant weight you have to equalize that on or off weight to make sure that that ship is always in a stable position.

CEOCFO: Where is the water coming from? What happens to it that we need to worry about where it is going when you dump it?

Mr. Candito: The typical example that people use is with a ship coming from China with ballast water loaded there. The ballast water loaded in China may have some kind of crabs or muscles that are common to Chinese waters, but not to the destination. Now, suppose this ship comes into San Francisco Bay and discharges the ballast water because it is taking on cargo. When that Chinese ballast water is released into the San Francisco Bay these crabs or muscles or shrimp are now in water where there may be no natural predators. Those organisms tend to multiply very rapidly and can cause significant damage to the environment. That damage might be that they start consuming other organisms that are in the water that are supposed to be there, or it could be something like clogging up a power plant cooling water intake, because these muscles multiply so quickly. These organisms without natural predators are called invasive species. The newly required ballast water treatment systems are designed to kill any of those organisms while they are on board the ship before the ballast water is discharged into San Francisco Bay as in the example that I was using.

CEOCFO: *If they are dead when they are discharged, it does not matter?*

Mr. Candito: That is the idea, right? When you load them on board they are alive and if you did not do anything to them they would be alive when you discharge them. However, you also have to be careful with the treated discharged water, not to harm any organisms that are intended to be there. Electro chlorination treatment systems need to neutralize their ballast water before discharge to make sure the residual chlorine does not do any harm. UV ballast water treatment systems need to have a second treatment prior to discharge to make sure they kill the invasive organisms.

CEOCFO: *Would you tell us about the Ecochlor ballast water treatment system that fixes the water perfectly?*

Mr. Candito: I appreciate you asking that question, because Ecochlor has the best system on the market. The Ecochlor system uses chlorine dioxide, which is sometimes compared to chlorine, but is actually a very different chemical compound. Chlorine dioxide has 2.5 times the disinfectant capabilities than chlorine. It works across a wider pH range and its effectiveness is not impaired by variations in salinity, temperature, turbidity, organics, and vibration. Because of its unique properties, it can be generated safely and reliably on demand and will not affect ballast tank coatings. Chlorine dioxide naturally decomposes, while chlorine does not and needs neutralization of the toxins prior to discharging the ballast water into the local waters. Chlorine dioxide has been used in the shore-side water treatment industry for more than 70 years and it really is the best way to treat ballast water.

CEOCFO: *Is the water constantly being treated or is it a certain time of day or every so many hours? What is the process?*

Mr. Candito: The Ecochlor System only treats the ballast water on intake. As ballast water comes through the pipes into the ship we treat it and then the water is clear of invasive species. After treatment there is a 24 hour hold time for the chlorine dioxide to naturally degrade before discharge. Other systems treat on intake and discharge or treat the ballast water on intake and then need to neutralize prior to discharging the water. This additional process can add to the system's complication and can become much more expensive and complicated for the crew to run, not to mention the additional power required for these processes.

“The reliability and simplicity of the Ecochlor system is a welcome option for ship owners who seek a system that is fully approved by the USCG and IMO.”- Steve Candito

CEOCFO: *Why is everyone not using Ecochlor? What is the competitive landscape?*

Mr. Candito: The market is driven by regulatory requirements and there have been numerous delays in the implementation of the guidelines. Therefore, the market is really just starting and we are very optimistic that Ecochlor is going to capture a significant portion of the market because our technology is comparatively better and our support services are better than our competitors because we constantly monitor our systems.

The Ecochlor System is best suited for mid-sized to the largest vessels in the world. The system has minimal scale-up in size as the ship gets larger – this is particularly important when installing a system on a ship that is not new. The OPEX on our system is very predictable and likely considerably less than our competitors when compared on an apples to apples basis including ballast water type, quality and power requirements to run the systems.

CEOCFO: *Do people buy the systems? Is it one per ship or might large ship needs four? Or, is the system at the dock and you hook up to it from there?*

Mr. Candito: Right now every ship is putting in their own treatment system. Some vessels would like an option for shore-side treatment in ports where the ship can pull up and get the clean ballast water it needs – this is particularly true of vessels that are typically smaller in size and don't have the space on board to fit a treatment system. Also, with partners we are looking at creating portable systems that are on a barge, allowing ballast water operations alongside the ship to either provide clean ballast water into their tanks or treat their ballast water during discharge. Currently, shipowners are still seeking these and other alternatives that might be either more cost effective or more user-friendly for the crew in the long run.

CEOCFO: *What is involved with operating this system?*

Mr. Candito: Ease of operation is one of the major advantageous of Ecochlor's System. It is a very simple system to operate.

A small amount of supply water flows into the generator to create a vacuum that draws the precursor chemicals, Purate™ BWT and acid, into a mixing chamber to generate chlorine dioxide on demand to treat incoming ballast water.

When the chemicals mix they form a solution which is then injected into the ballast water line prior to entering the ballast tanks.

Our competitor's systems can be much more complicated depending on the water, shipping route and length of time at sea as well as weather related issues. If you have very dirty water, UV light systems are going to have difficulty killing the organisms because they cannot penetrate the dirty water. Those systems have to have the power turned up or slow down their ballasting operations, which complicates that system and can add significantly to the operating costs. There are electro chlorination systems that depend on salt water to generate chlorine, so if you are in a freshwater port then that system will need to adjust for the salt content. Any variations from 'perfect' operating conditions for these treatment technologies can make it more complicated for the crew to operate. To some extent, the Ecochlor System is basically an on and off switch and is all automated based on the flow rate in the system.

CEOCFO: *Do you have to store chlorine dioxide in a particular way?*

Mr. Candito: No, chlorine dioxide is generated on demand and is not stored on the vessel. The precursor chemical metering pumps are flow paced to produce the treatment required for the ballast water flow rate prior to entering the ballast tanks. That is one of the advantages of our system, in that it kills all the organisms, but 24 hours later it is gone after naturally degrading to salt.

CEOCFO: *Who are the regulators that have a say in any or all of this process?*

Mr. Candito: As previously mentioned, the IMO, which is an international regulator for the maritime industry has guidelines that require compliance and in the US it is primarily the Coast Guard that is setting the regulatory guidelines. However, in the US, the EPA also has some requirements that come into play primarily in the efficacy of the discharged ballast water. Actually, there is a court case challenging whether it is the Coast Guard or EPA who should have the lead on inspections. Adding to the confusion, certain states also have their own individual requirements that can be more stringent than either the Coast Guard or the EPA requirements.

CEOCFO: *Are these ship owners paying enough attention or do you feel that many are waiting till it all sorts out before they get too concerned or involved?*

Mr. Candito: The regulations were proposed more than a decade ago. Back then, clearly, the shipowners were waiting for more guidance and appropriately so. Historically, there has been concern over systems that did not work but had still received IMO Type Approval from compromised or inadequate testing. The US Coast Guard is testing the ballast water treatment technologies under more specific guidelines. Currently, there are only nine systems in the world that are approved to be used in the US; Ecochlor is one of the nine. However, there are probably fifty or sixty different treatment systems in the market with differing technologies and levels of effectiveness. Now with this additional USCG testing, and the new tougher IMO Type Approval procedures, the wait is over and the owners are now getting more engaged with putting the systems on board as well as getting the experience needed to operate it.

CEOCFO: *How do systems differ from ship to ship?*

Mr. Candito: There are many differences. Size is a big one. As I mentioned, Ecochlor has a fairly compact system and does not change much in size from the smallest to the largest system in our inventory. Other systems may need additional banks of UV lights, use a much larger electro chlorination system or need to purchase multiple systems in order to treat the amount of ballast water necessary for the ship's operation. As ballast water needs increase due to ship size, typically our competitor's systems get much larger and sometimes are so big that they have trouble fitting it on board the ships, particularly in a retrofit. With a newly built ship then you can design around how much space you need.

Another big issue is that many of the systems use a lot of power. The Ecochlor system has very low power needs, if not the lowest in the industry. With some of the other systems you might have to buy the system and then you have to buy an additional electrical generator to have enough electricity to power those systems. That is a big disadvantage with many of our competitors.

CEOCFO: *How are you reaching out to ship owners? How are ship owners coming to you? What is the geographic reach? What is happening today?*

Mr. Candito: It is a worldwide market. In fact, many of our customers are outside the US. These customers are generally coming from major shipping centers, such as Greece or Singapore, where there is a lot of maritime activity. Our sales approach includes using both an in-house sales team and agents located worldwide. Our website receives inquiries and shipowner leads which are directed to our sales team and responded to within 24 hours. The Coast Guard website lists the nine approved companies with links to our website.

In addition, we market through a monthly ballast water regulatory update that our clients and prospects find very helpful in keeping up with the changing regulations. It does not just tell them about our system, it also includes updates on the various regulatory requirements and important news concerning the ballast water management market. In addition, we also have a twice monthly ballast water report on Maritime TV interviewing experts in the market. Lastly, our team speaks on topics of interest for audiences in the maritime market to audiences worldwide; people within our knowledgeable team write abstracts, white papers and articles for publication and we advertise in various magazines and newspapers with ballast water treatment features around the globe.

CEOCFO: *Is ballast water rising in what companies have to pay attention and not just have on the sidelines?*

Mr. Candito: Yes. Actually, the ballast water issue is just starting to peak right now. There is a tremendous focus, as it should, because the deadlines are coming up over the next five years. There is a phase in period, so not every ship has to have it on the exact same date, but the expectation is that by 2022 a majority of ships will have some sort of ballast water treatment in their management and operations plan.

CEOCFO: *What gave you the confidence way back when that this was something that was not only needed but that would become a necessity or accepted?*

Mr. Candito: There were a couple of things. The first and foremost was knowing that our chlorine dioxide technology was a great solution for ballast water treatment. Our founders knew that chlorine dioxide was being used successfully in the shore-side water treatment industry and had a terrific track record. The second thing was recognizing that ballast water management was going to be difficult for ship owners to add into the operation of their vessels and we wanted to make sure that there was a system that would be simple for the crew to use. Combining these two issues, we wanted to offer the best technology, while still keeping the system simple to operate.

CEOCFO: *Would ship owners typically look at your system for their whole fleet? Is it very much ship by ship? What are you finding?*

Mr. Candito: For the most part we are getting fleet wide contracts. Recently, we negotiated a contract with the Angelicoussis Shipping Group of Greece and they were looking at putting our system on their whole fleet. Depending on the type and size of the ship it is a very common practice to negotiate and install systems for the fleet because it makes it easier when you are training your crews or ordering spare parts. Of course, most system manufacturers are usually more cost competitive when pricing a whole fleet, rather than a one-off ship. Typically, the only time that we see owners not considering us for their whole fleet is when they have small ships where the benefit of our system scaling up well does not apply.

CEOCFO: *Once you have installed a system what if any is the ongoing relationship? Is there maintenance and servicing?*

Mr. Candito: This is a very important point! Ecochlor is in constant touch with the ships that install our system. We look at our relationship with the shipowners more as a service provider as opposed to just selling them a piece of equipment. The genesis of this service focus really started because we have to resupply the treatment chemicals, approximately twice a year. For that reason, we are in constant touch with the ships - we know that when the ship needs more chemicals or if there are some customer support needs.

Also, in response to the industry needs, Ecochlor has put in place a collaborative effort between the vessel operators and our Service Team. All ballasting operations with an Ecochlor System are tracked automatically through a Functional Data Monitoring Sheet (FDMS) which summarizes critical operational data and is then sent to us by the ship's crew. This data is reviewed by our team of engineers. If the Service Team notices any irregularities, or if the crew has concerns, they are proactively addressed through remote troubleshooting or by a ship board visit. The crew looks at this support as a key factor in assisting them to meet regulatory compliance. We also have a computer-based training program. Finally, crews and operators can reach out to us, if needed, at our 24/7 international call center.

CEOCFO: *Why is Ecochlor, Inc an important company?*

Mr. Candito: Ecochlor definitely provides the best technology to ensure compliance with an important environmental requirement. Our technology works well. It is easy for the crew to use. The Ecochlor Service Team helps to monitor the ballast water operations with the crew and we are only a phone call or an email away if they are having difficulties. The reliability and simplicity of the Ecochlor system is a welcome option for ship owners who seek a system that is fully approved by the USCG and IMO.