



NMA REPORT #R-395, Revision 3

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Asserting our right "...to petition the Government for redress of grievances."

Amendment 1, U.S. Constitution, Dec. 15, 1791

[**Publication History:** Our Association published and distributed the initial edition of this report on May 19, 2004 to Members of Congress. **Revision 1** updated the report to describe Congressional action taken on September 2004 and request for regulatory follow-up. **Revision 2**, Nov. 22, 2006 further updates the issue to include a successful mariner lawsuit to recover damages in a potable water case. On Jan. 1, 2008, our Association formally changed its name from Gulf Coast Mariners Association to National Mariners Association. **Revision 3**, Sept 21, 2010 changes the title of the report and adds new information and by Capt. Kelly Sweeney. We separated ofFood Serviceo from this issue and placed it in a separate report #R-455, Rev. 1. Research File #GCM-44.]

REPORT TO CONGRESS – PROVIDING SAFE POTABLE WATER FOR MERCHANT VESSELS

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EXECUTIVE SUMMARY

Although the National Mariners Association (NMA) speaks on behalf of the safety, health, and workplace issues affecting approximately 126,000 "limited tonnage" merchant mariners serving on tugs, towboats, offshore supply vessels, small passenger vessels, and other workboats, we believe the potable water issue affects all merchant mariners as well as members of the public using waterborne transportation.

Before Sept. 9, 2004 when Congress amended 46 U.S. Code §3305 (below), our Association presented serious concerns about the poor quality of potable water used for drinking, cooking, and bathing aboard many vessels. This potable water often carried, stored aboard, and delivered from other merchant vessels. The water on board many vessels is of poor quality, carelessly handled and stored, never tested, unpalatable, unsafe, and unsanitary. Although we reported this information to several Federal Executive Branch agencies including the Coast Guard, we were led in circles until Congress clearly delineated responsibility for regulating potable water quality and quantity by statute to the Secretary of the Department of Homeland Security.

We respectfully ask Congress to ensure that the Coast Guard trains its vessel inspectors to inspect potable water systems on all merchant vessels to ensure that they are properly constructed and maintained and that the water in those systems is regularly tested to ensure clean and sanitary fresh water for drinking, cooking, laundry, and bathing purposes.

Congress recently provided additional billets for Coast Guard inspectors and investigators and established the Towing Vessel National Center of Expertise in Paducah, KY, to prepare inspectors to address this large class of previously uninspected vessels where many of our "limited tonnage" marinersø work and many (but not all) potable water complaints originate. Although the details of the new towing vessel inspection rulemaking are not yet public, our Association previously requested the inclusion of potable water system inspection in our comments submitted

to the rulemaking docket in 2005. [⁽¹⁾Refer to our Report #R-276, Rev. 9, Issue #42.]

Since providing clean and sanitary potable water remains a problem on many vessels, we respectfully ask Congress to call upon the Secretary of the Department of Homeland Security to direct the Coast Guard to train and use its inspectors and investigators to attend to all aspects of the potable water issue that affects many working mariners as well as members of the public utilizing public and private sources of marine transportation.

The Coast Guard opened a docket⁽¹⁾ on July 11, 2005 and solicited input from the public and, to the best of our knowledge, have not further addressed the issue. [⁽¹⁾70 FR 39699-39700, July 11, 2005, Docket #USCG-2005-20052.]

EXISTING STATUTES AFFECTING POTABLE WATER

46 U.S. Code §2103 states that “The Secretary has general superintendence over the merchant marine of the United States and of merchant marine personnel insofar as those vessels and personnel are not subject, under other law, to the supervision of another official of the United States Government. In the interests of marine safety and seamen’s welfare, the Secretary shall enforce this subtitle...the Secretary may prescribe regulations to carry out the provisions of this subtitle. The Secretary may prescribe regulations to carry out provisions of this subtitle.”

46 U.S. Code §3305(a)(1)(D): The inspection process shall ensure that a vessel subject to inspection has an adequate supply of potable water for drinking and washing by passengers and crew.

46 U.S. Code §3305(a)(2)(A-D): In determining the adequacy of the supply of potable water under paragraph (1)(D), the Secretary shall consider..

- (A) The size and type of vessel;
- (B) The number of passengers or crew on board;
- (C) The duration and routing of voyages;
- (D) Guidelines for potable water recommended by the Centers for Disease Control and Prevention and the Public Health Service.

46 U.S. Code §10902. Complaints of unfitness.

- (a)(1) If the chief and second mates or a majority of the crew of a vessel ready to begin a voyage discover, before the vessel leaves harbor, that the vessel is unfit as to crew, hull, equipment, tackle, machinery, apparel, furniture, **provisions of food or water**, or stores to proceed on the intended voyage and require the unfitness to be inquired into, the master immediately shall apply to the district court of the United States at the place at which the vessel is located, or, if no court is being held at the place at which the vessel is located, to a judge or justice of the peace, for the appointment of surveyors. At least 2 complaining seamen shall accompany the master to the judge or justice of the peace.
- (a)(2) A master failing to comply with this subsection is liable to the United States Government for a civil penalty of \$500.
- (b)(1) Any 3 seamen of a vessel may complain that the provisions of food or water for the crew are, at any time, of **bad quality, unfit for use, or deficient in quantity**. The complaint may be made to the Secretary, commanding officer of a United States naval vessel, consular officer, or chief official of the Customs Service.
- (b)(2) The Secretary, officer, or official shall examine, or have examined, the provisions of food or water. If the provisions are found to be of **bad quality, unfit for use, or deficient in quantity**, the person making the findings shall certify to the master of the vessel which provisions are of bad quality, unfit for use, or deficient.
- (b)(3) The Secretary, officer, or official to whom the complaint was made shall -
 - (b)(3)(A) make an **entry in the official logbook** of the vessel on the results of the examination; and
 - (b)(3)(B) submit a report on the examination to the district court of the United States at which the vessel is to arrive, with the report being admissible into evidence in any legal proceeding.
- (b)(4) The master is liable to the Government for a civil penalty of not more than \$100 each time the master, on receiving the certification referred to in paragraph (2) of this subsection -
 - (b)(4)(A) does not provide other proper provisions of food or water, when available, in place of the provisions certified as of bad quality or unfit for use;
 - (b)(4)(B) does not obtain sufficient provisions when the certification includes a finding of a deficiency in quantity; or
 - (b)(4)(C) uses provisions certified to be of bad quality or unfit for use.

THE POTABLE WATER ISSUE

Potable Water: Whose Problem is it?

Our Association asserts that an employer (e.g., boat owner or operating company) must provide adequate quantities of clean and safe potable water for an inspected vessel on a voyage of any duration. While this is done routinely by many well managed companies, it is clearly a problem with many others.

While providing bottled drinking water may be suitable and may provide a suitable solution in some cases, water is also used for bathing and cooking, uses that are amenable to an engineering solution (below). The difficulty arises in the fact that there is an absence of meaningful Federal regulations, an absence of state control over private water systems. Until our Association contacted Congress on this matter, no government agency we contacted appeared to be willing to step up to the plate to protect the health and safety of our mariners. Not only does the problem of potable water affect our limited tonnage merchant mariners, also exists for other workers who may be aboard a vessel as passengers or persons in addition to the crew and on every type of commercial vessel including drilling rigs and offshore production facilities.

Our attempts to solve this problem were frustrated by two federal agencies, the Coast Guard and the Department of Health and Human Services that both exhibited little regard for our mariners. Consequently, we asked that Congress clarify the issue and direct an appropriate Executive Branch agency to provide regulatory coverage to protect the health and welfare of our mariners by whatever means is necessary.

Reform Stalls in "Marine Safety"

Congress clarified the issue in 2004 by amending 46 U.S. Code §3305 and assigned the task of managing potable water to the Secretary of the Department of Homeland Security (DHS) and the Coast Guard. The Coast Guard opened a docket⁽¹⁾ on July 11, 2005, solicited and received meaningful input from the public and postponed further action on the project. Nevertheless, the problem with safe potable water persists and a new approach may be necessary. We respectfully ask Congress to revisit this issue on behalf of our working mariners. [⁽¹⁾70 FR 39699-39700, July 11, 2005, Docket #USCG-2005-20052.]

New Approach

- **Inspection issue.** There are no meaningful provisions in any set of vessel inspection regulations that require testing the quality of an inspected commercial vessel's potable water. We ask that the Coast Guard develop and implement a reasonable and scientifically valid inspection and testing program. In cases where deficiencies are found, the inspection regulations should require that they be corrected. We ask that towing vessels specifically be included as inspected vessels.
- **Amend 46 U.S. Code §10902, Complaints of unfitness.** We ask Congress to amend the statute to allow mariners on small vessels with small crews to file complaints directly with Coast Guard inspection personnel that would trigger scientific water sampling, testing and evaluation and correction if necessary at times other than those normally set aside for vessel inspection. Mariners would receive whistleblower protections for reports made in good faith as currently authorized by Congress. The existing statute dwells on foreign voyages and utilizes courts and officials our mariners seldom interact with.

EXAMPLE #1 – WORMS FOUND IN A TOWING VESSEL'S DRINKING WATER

The M/V Dan MacMillan was a 27-year-old steel, 10,500 hp linehaul towboat owned by the American River Transportation Company of Decatur, Illinois, operating on the Lower Mississippi River on Oct. 12, 2001.

At around 0805 Deckhand Red Gonzales informed me he was washing his hand in the sink in the deck locker when a small parasite worm came out on his hand. He went and got a jar for a sample and put the parasite in the jar.

I immediately call(ed) (the) operations (office) for Port Captain Raymond Hopkins who transferred me to Port Engineer Neil Platt who I informed what he had found. I contacted Helena Marine Service for bottled water as per Neil Platt. s/Captain Larry Gwin

Around 8 a.m. on Friday Oct. 12, 2001, I was informed that there was something in our water supply. It looks like two worms. I then checked our water system and changed two filters. Everything looks good even the old

filter. Neil Platt was informed. s/David Perry, Chief Engineer

øHe called me back later that morning and said he would have a crew at Wepfer Marine on standby for our arrival and they would inspect and clean the water tanks.

øUpon arrival at Memphis, I pushed the towí into the lake í with the help of harbor boats. Tied off, secure. Proceeded light boat to Wepfer dock where I contacted the fleet dispatcher. He said there was a bucket of swimming pool cleaner, and we were supposed to pour it in the water tank and put the crew in the tank to clean it.

øI objected because we did not have the proper gear or personal protective equipment. This made Mr. Platt very mad. He said (that) this is what you put in your backyard (swimming) pool. I told him I did not care (and) that I was not putting my crew in the confined space anyway.

øFinally they got the Wepfer shipyard managerí to come down and proceeded to clean the tanks with the help of my crew.

øSupposedly, (the shipyard manager) took water samples but we never heard the results. Later we went to the shipyard and after the boat was raised on drydock, you could see water spraying out of cracks (and) splits in the hull. If water leaks out, common sense will tell you that it will leak back in (from the river) when the water in the tank reaches a low level. s/Captain Larry Gwin

EXAMPLE #2 – DRINKING WATER ON OLD OFFSHORE SUPPORT VESSELS

The M/V STINGRAY is a 25-year old, Coast Guard-inspected steel oilfield øliftboatö owned by Global Marine Industries that carries a crew of three mariners and 16 øpersons in addition to the crew.ö These øpersonsö are oilfield workers who perform work from the liftboat while it is jacked up out of the water at an offshore job site. They live on the øliftboatö while they work on nearby oilfield installations. øLive” includes working, eating, sleeping, bathing, washing clothes and watching TV when there is a signal available.

One of our mariners commented on the situation as follows (edited):

øDuring the month of June 2003, I was transferred to the liftboat STINGRAY í I have dealt with some bad experiences aboard this vessel as well.

øIn January 2004 we were working on a job for Apache at Eugene Island (block) 188P. We arrived on location on a Fridayí without a cook on board. The cook did not arrive until Saturday afternoon in time to prepare the 5:00 PM mealí several other Captains on (company redacted) boats had run this cook off their boats for being filthy as well as for being caught cooking with so-called potable water that the boats carry in their rusty and contaminated steel tanks. This water is dirty, nasty stuff that is often pumped to us from offshore supply boats!

One of the construction crewmembers came to me and saidí I believe that cook is using sink water to cook with. So I began to watch the cook closely and caught him cooking some grits with the øsinkö water. Members of the 12-man construction crew and I began to have a serious diarrhea problem and severe stomachaches and cramps. So I went in and confronted the cook about the situationí

Same Company – Different Liftboat

During my stay on the Liftboat POMPANO (June 2001 to June 2003) there were times when we would run out of bottled water that our employer allowed us to order on the weekly grocery list. I recall one time when our Captain called our General Manager and told him we only had 4 cases of bottled water left on the boat. At this time we were offshore on an (oilfield) diving job with a full diving crew.

The Captain told us the General Manager said we would have to use the potable water in the boatø tanks for drinking and the cook would have to use it to cook with as well.

I approached the Diving Superintendent and explained the situation to him. He became very upset and telephoned his immediate superior who, in turn called our General Manager. The General Manager called the Diving Superintendent with an apology and sent the bottled water out on the next crewboat.

The Diving Superintendent uncovered the fact that our Captain had ordered the bottled water on his grocery list from the beginning but that the General Manager had arbitrarily cancelled the water from the grocery list. s/ Mark A. Blackman, Feb. 5, 2004

EXAMPLE #3 –EPOXY TANK COATINGS ON NEW & REFURBISHED WATER TANKS

Our Association received reports of the faulty applications of two-part epoxy tank coatings on a new inspected oilfield utility boat and a refurbished harbor tug. The two part formula on the utility boat was improperly mixed and never dried. The boat was put into service in spite of the crew's complaints. Eventually, it was withdrawn from service and a crew from the shipyard with fresh air breathing apparatus entered the water tank and wiped off the original coating, dried the tank, and applied the coating properly over a two-day period.

On the refurbished uninspected harbor tug, the potable water from an old steel tank had a strong chemical taste and an overpowering chemical odor as in the case of the utility boat (above). A crew member took a water sample and a supervisor turned the sample in to company management. The water sample was never tested and the crew had to work the vessel until the taste and odor went away. Crew members did not report the incident to the Coast Guard for fear of losing their jobs.

EXAMPLE #4 – UNSAFE CHEMICALS IN TANK COATINGS. MARINER WINS CONTAMINATED POTABLE WATER LAWSUIT

[Source: Lee J. "Jeff" Bloomfield, Esq. and Brian S. Katz, Esq. Bloomfield & Katz, 2226 Broadway, Suite 1, P.O. Box 2903, Paducah, KY 42002-2903. Richard L. Taylor v. Teco Barge Line. United States District Court, Western District of Kentucky, Paducah, KY, 5:04cv33-R. As reported in GCMA Newsletter #42, Aug./Sep. 2006.]

Taylor was a second mate for Teco Barge Line, Inc. working on the board its vessel, the M/V ANN PETERS.

Beginning in Nov. 2000 and continuing through early May 2003, Taylor was repeatedly exposed to Bitumastic 300M, a hazardous coal tar based product that was used to line the potable water tanks of the vessel. As a result of these exposures, Taylor developed chronic contact dermatitis, and he now suffers from chronic rashes on his body, which will continue for 30 to 40 years. He has to undergo regular phototherapy to help alleviate the condition. He also suffered an increased risk of cancer as a result of this exposure.

Taylor sued the company, alleging negligence under the Jones Act in that it knew or should have known of the presence of Bitumastic 300M on its vessel, and also that it should have known of the dangers of the product. He also alleged that the company failed to provide a safe place in which to work, and that it failed to provide adequate confined space entry equipment or procedures. He also alleged that the presence of the product rendered the vessel unseaworthy.

The company denied that the plaintiff was exposed to the extent that he claimed, or that his injuries were caused by his exposure. It claimed that any damages that he suffered were a result of hypersensitivity. It also claimed that Taylor was negligent.

A jury awarded the plaintiff \$1,000,000.00. There had been no settlement offers from the company.

The Coast Guard Clearly Understands the Health Problems

In Oct. 1999, the Commandant promulgated COMDTINST M6240.5 titled Water Supply and Wastewater Disposal Manual to provide standards and public health information for Coast Guard personnel responsible for producing, storing, monitoring, and using potable water and wastewater systems at afloat and ashore units and states that this Manual applies to all active and reserve afloat and ashore commands. The Table of Contents reveals the extent of the Agency's knowledge of the subject. This book is also evidence that the Coast Guard has an active concern for its own regular and reserve personnel. Apparently, the Coast Guard is unwilling to extend its concern to our merchant mariners and to other persons utilizing marine transportation.

We note recent declarations that ferries transport over 20,000,000 passengers each year. We have no figures on crews transported by boat to inland and offshore oilrigs and platforms.

In addition, the Coast Guard identified several publications by the International Organization on Standardization (ISO) that provide technical standards they believe are pertinent:

- ISO 14726-2:2002 Ships and Marine Technology- Potable Water Supply on Ships and Marine Structures; Part 1- Planning and Design.
- ISO 15748-2:2002 Ships and Marine Technology ó Potable Water Supply on Ships and Marine Structures; Part 2- Method of Calculation.

Regulations of Other Agencies

The Department of Health and Human Services, Food and Drug Administration, has regulations in 21 FR Parts 1240 and 1250 dealing with the source and use of potable water and sanitation facilities on vessels. Although we are familiar with DHHS inspectors visiting new vessels under construction in shipyards as a part of the vessel inspection process, we sought additional information on how many vessel re-inspections by trained HHS public health personnel have been made. We are not familiar with whether visits to new or existing uninspected towing vessels are required since these vessels never have been part of the Coast Guard's inspection process and, after six years, the Coast Guard still has not even published a Notice of Proposed Rulemaking (NPRM) on towing vessel inspection regulations. **Consequently, many vessels our mariners serve on have never had their potable water systems inspected or the quality of the water tested.**

[NMA Comment: We ask that Congress specifically require by statute that the potable water systems on towing vessels be subject to meaningful inspection standards.]

We note in reviewing Marine Safety Manual, Volume X, Interagency Agreements and Acronyms, COMDTINST M16000.15, that there are no interagency agreements between the Coast Guard and the Food and Drug Administration regarding the inspection and maintenance of potable water systems on vessels served by our mariners. We also note that, while DHHS has a high profile on the cruise ship industry which is largely "foreign flagged." At the same time, few of our mariners witness comparable sanitation inspections and even fewer of our American-flag vessels enjoy any government oversight on their potable water systems.

We respectfully requested that the Coast Guard work with DHHS to craft an appropriate agreement between the two agencies to ensure that the potable water systems on all vessels served by our mariners were satisfactorily protected. Thereafter, we requested that the Coast Guard (or DHHS) introduce an appropriate set of regulations to protect our mariners from waterborne diseases comparable to existing COMDTINST M6240.5 promulgated by the Commandant for Coast Guard personnel. **We specifically requested that this include periodic mandatory periodic testing of potable water in vessel storage tanks.** We note that the Environmental Protection Administration recommends that using laboratories certified by individual states to perform tests on drinking water taken from the potable water systems of our vessels. **Unfortunately, nothing of this nature was undertaken following the 2004 amendments to 46 U.S. Code §3305 (above!)**

OUR ASSOCIATION'S POTABLE WATER RULEMAKING EFFORTS

On Dec. 27, 2002, the Gulf Coast Mariners Association (now "NMA") initiated a petition to the Executive Secretary of the Marine Safety Council at Coast Guard Headquarters requesting regulations to ensure safe potable water on inspected and uninspected vessels of less than 1,600 gross register tons. Our petition was assigned Docket #USCG-2003-14325⁽¹⁾ in the Docket Management System. **We learned the hard way that opening a "docket" does not mean that regulatory action will be forthcoming.** ⁽¹⁾ Refer to the docket on the internet at <http://dms.dot.gov>]

A review of existing Coast Guard regulations, policies and guidance reveals little attention to potable water systems on commercial vessels. A review of existing Navigation and Vessel Inspection Circulars shows there is no active guidance published on this matter whatsoever. Nor is there any mention of potable water systems in Marine Safety Manual, Volume II, Materiel Inspection. Nor is there any mention in any Coast Guard vessel inspection regulations including existing regulations governing uninspected towing vessels, where over 32,000 mariners are employed, that even direct readers to regulations enforced by any other government agency – such as those of the Department of Health and Human Services (DHHS). **There is a complete void.**

The Health Problem

Our Association is actively concerned with the matter of seamen's health and welfare. **Since humans cannot live without water, we are concerned that our potable water be clean, pure, and free of disease causing organisms.**

Working vessels such as tugs, towboats, ferries, small passenger vessels and offshore supply vessels take on water from a number of different sources including hoses on docks, water barges, and from water passed through the storage tanks other vessels including tanks not dedicated to potable water. Many of the tanks used to store

potable water are steel tanks that may or may not have appropriate coatings to protect human health. (See Example #4 (above)) Many potable water tanks are not be accessible or fitted so they may be cleaned. **No records are required that will show when potable water is chemically treated, with the amount, or even the identification of the chemicals used to treat it. The same is true of the absence of records requiring or substantiating periodic potable water tank cleaning.**

Rust is often a serious and visible problem as are deteriorating coatings and the lack of basic filtration of solids. Rust also causes the tops and sides of potable water tanks to deteriorate and allow contaminants to enter the damaged tanks.

Water treatment almost exclusively consists of **pouring undetermined and unregulated quantities of bleach into the storage tanks at undetermined periods.** There are many brands and formulas, some of which may be inappropriate for human consumption.

Almost all of the estimated 6,000 towing vessels currently remain "uninspected" for all intents and purposes although some vessels in service now receive a Coast Guard "examination" under an interim "bridging" program. Some potable water tanks may be constructed on a common bulkhead with fuel, ballast, or cargo tanks or in contact with an adjacent polluted bilge. Few hose spigots are equipped with vacuum breakers that could prevent contaminated water from flowing back to potable water tanks. Some vessels do not have dedicated water hoses that are used for no purpose other than to handle drinking water. Tanks and associated plumbing often leak while homemade repairs may compromise the integrity of the system.

Congress Caught the Coast Guard Passing the Buck to DHHS

Previous editions of this report informed Congress of how the Coast Guard tried to pass the buck to the Department of Health and Human Services. We will omit the details and move forward other than to say that Congress exercised good judgment in amending 46 U.S. Code §3305 in 2004. (see "Existing Statutes" above)

Coast Guard plan approval for "inspected" vessels does include a review of the configuration of potable water systems. The Coast Guard Marine Safety Center examines potable water systems for compliance to 21 CFR Part 1250 and applicable 46 CFR regulations.

[NMA Comment: While this may be true for inspected vessels, most of the nation's estimated 6,000 uninspected towing vessels served exclusively by our "limited tonnage" mariners were built over the years without going through any regulatory "plan approval" process.]

The Coast Guard pointed out to us that although the Coast Guard is not the approving authority, the Marine Safety Center advises submitters of noted problems and requires submitters to obtain approval from either the local FDA or Public Health Service office responsible for potable water systems on vessels and provide documentation of approval to the OCMI. The improper configurations we pointed out regarding potable tanks sharing common bulkheads with unsuitable tanks should be brought to the attention of the HHS for their action.

[NMA Comment: We believe that Coast Guard inspectors require suitable training to deal with all potable water problems and that the Coast Guard rather than our mariners or company officials must deal with other government agencies including DHHS wherever necessary.]

State Health Agencies

As part of our background preparation for earlier editions of this report, NMA contacted the Louisiana Department of Health and Hospitals on several occasions and in particular Ms. Karen Irion, the administrator for the state's safe drinking water program. We learned that scientific testing of public potable water supplies is a **highly technical matter**. The problem that affects our mariners most likely occurs as or after the water leaves the public water system and is taken aboard "private" vessels and is no longer a part of the public water supply under state control. Essentially, the water is now out of the public realm and **belongs** "to the boat owner" - complete with any problems it may have.

The Louisiana Department of Health and Hospitals provided us with a list of EPA-approved laboratories that can perform microbiological and chemical analysis of drinking water. We contacted ENTEK Environmental Laboratories in Baton Rouge, LA, and established a commercial relationship to arrange for testing potable water specimens provided by our mariners. They insisted that water samples be collected in a scientific manner and brought without delay and often under controlled temperature conditions to the lab for analysis. This is often very

difficult for our mariners to accomplish on their own, especially without the cooperation of their employer.

A typical chemical analysis costs approximately \$170 and the microbiological analysis, if requested, could run over \$1,000. These estimates are more than individual mariners can afford to check upon the safety of the water that they are expected to drink, cook with, or use for bathing purposes.

ENGINEERING SOLUTIONS OFTEN ARE POSSIBLE

[Source: *Purification System Clears Onboard Water*, by Katie Antalick, *The Waterways Journal*, Feb. 23, 2004, p. 7]

Contaminated drinking water on towboats may be a thing of the past. Bill Meek and Pam Mitchell co-owners of Controlled Water Systems said their three-step water purification process leaves unsafe, smelly, and bad tasting water behind. Meek and Mitchell had worked on purifying water in hospitals or large buildings for several years, but decided to give towboats a try with the suggestion of Mitchell's father, Jimmie Brown, a retired captain from Southern Towing.

"My dad just retired from the riverboats after 46 years and he asked what we could do to clean up the water," she said. ***With onboard water tanks typically contaminated with sediment, dirt, trash, or bacteria***, Meek said. There was a problem with the 8,000 to 10,000-gallon potable water tanks not staying clean from cracks or leaks in a hull wall or other means, such as chlorine becoming inactive after 48 hours.

"A lot of these old boats will have galvanized lines or steel piping, and trash, dirt, dust and rust gets into the tanks, making water have an objectionable taste and smell," said Meek.

In order to counteract the contamination, Controlled Water Systems installs a three-step system that includes sediment removal, purification of water by UV light and polishing by removing any bad taste or odor. Meek said the system is very similar to systems that are used on cruise ships.

Both the sediment removal and polishing processes use filters, but the UV purification process uses an electro polished stainless steel reaction chamber.

"That lamp has an output of 240 nanometers," Meek said. "The National Sanitation Foundation (NSF) said that it kills 99.99 percent of bacteria including cryptosporidium and giardia."

The system also has a monitor to alert boat personnel if anything needs cleaning or if a lamp needs replacement. The only electricity required to run the system is 120 volts at 0.5 amps.

A differing system can also be installed for bathrooms. With the use of washable and reusable sediment cartridge, Meek said problems with silt and sediment build up will disappear. Another system prevents hard water buildup in ice machines.

So far, Meek said the 25 owners of the boats in which his company has installed the systems have been pleased.

"They said the water has been crystal clean, tastes great. Coffee and tea tastes much better with this and their laundry isn't stained," said Meek. "I had a guy tell me that he wouldn't take anything for this and he was the chief engineer. He could get a glass of water right out of the tap."

The cost of the water purification system is about **\$4,500** for an average size boat.

Since many companies are purchasing bottled water or cartridges for current systems that require more replacement, Meek said the cost of the system is relative.

Some companies who have elected to use the systems include Magnolia Marine Transport in Jackson, Miss. and Southern Towing in Memphis Tenn. For more information, call (731) 645-3222.

[NMA Comment: Water purification equipment of all types is readily available. What is lacking is a clear set of Coast Guard regulations that will require *periodic water testing* and, if required, installation and professional maintenance of necessary equipment on commercial vessels.]

ADDITIONAL INSIGHT REVEALS FURTHER PROBLEMS WITH POTABLE WATER

Onboard Systems Don't Always Provide Clean, Safe Water

[Source: By Capt. Kelly Sweeney, *Professional Mariner Magazine*, Oct./Nov. 2010, pgs 55, 56. ***Emphasis is ours!*** Kelly Sweeney holds the licenses of master (oceans, any gross tons) and master of towing vessels (oceans), and regularly sails on a wide variety of commercial vessels. He lives on an island near Seattle. You can contact him at captswweeney@professionalmariner.com.]

One morning while out on deck having my first cup of coffee, I started talking with Dan, a QMED (qualified member of the engine department) who was enjoying his usual breakfast of a cigarette and black coffee. We were on a ship working off the coast of Panama, so when conversation turned to the subject of coffee, I touted the fresh Panamanian brew the steward had brought aboard.

He agreed, but then added, "Regardless of the coffee and the machine, Kelly, it's good water that makes the best coffee and you won't find good water on merchant ships."

"What do you mean?" I asked. "The distilled water you engineers make on board is great."

He shook his head and said, "If the seawater we take on board is loaded with chemicals, distillation won't eliminate them. We have been making water within 12 miles of the coast, so the toxic pesticides and herbicides from the shore runoff and rivers ends up in our drinking water."

All of a sudden my coffee didn't taste so good.

Fresh water is vital on board, and making sure that the ship has an ample supply is one of the many important jobs the engineering department takes care of. Most seagoing vessels employ either an evaporator system that uses distillation or a pressurized screening/filtering system called reverse osmosis to convert seawater into potable water. In the evaporator system, seawater is heated and turned to steam, after which the fresh water condensate is collected and used for drinking, cooking, and washing on board. Reverse osmosis forces seawater through progressively finer filtering to produce fresh water. These two methods have been used for decades, but nevertheless have definite drawbacks and limitations. For example, neither will remove volatile organic compounds such as benzene or trichloroethylene.

Another time when I was chief mate on an oceanographic ship working off the coast of California, we took on fresh water while docked in port. After nearly three weeks at sea doing coastal research, and with nearly 50 scientists and crew aboard, it wasn't long before we had to utilize our reverse osmosis system. One night, after a hard rainstorm, as we watched the local TV news in the lounge, the anchorman reported that the coastal waters had been declared unsafe for swimming because of the runoff. Hearing that, and remembering Dan's remarks, I thought to myself, "Great, the same water that's unfit to swim in we're making drinking water from."

As part of the Coast Guard and Maritime Transportation Act of 2004, the government established that the quality of potable water made on board merchant ships must meet the U.S. Centers for Disease Control (CDC) guidelines. These guidelines essentially deal with filtering and the addition of a disinfecting agent, like chlorine, to keep people from getting sick from water tainted with bacteria or viruses. They do not, however, address the amount of chemical contaminants found in the intake seawater, such as petrochemicals from industrial areas, agricultural runoff, crude oil or dispersants used during an oil spill.

Recently, water quality on commercial vessels was in the news when it was reported that Mobile Offshore Drilling Units (MODUs) working near the site of the *Deepwater Horizon* disaster were using seawater tainted with crude oil and the dispersant Corexit in their shipboard watermakers. Crude oil contains several dangerous carcinogenic components such as benzene and toluene, while Corexit has a large percentage of petroleum distillates, propylene glycol and sulfonic acid. According to the material data safety sheets (MSDS) for both crude oil and Corexit, neither is supposed to be taken internally. Yet reports from the Gulf pointed out that no one was testing for their presence in the drinking water on board MODUS making water in the contaminated Gulf of Mexico oil spill area.

The word among mariners at the scene was that when confronted with the possibility of U.S. Coast Guard inspections of the water systems on the rigs, fresh water from U.S. ports on the Gulf Coast was quickly delivered. The fresh water from shoreside sources met not only CDC guidelines, but U.S. Environmental Protection Agency (EPA) regulations as well and exemplifies the double standard of water quality that exists on commercial vessels.

When an engineer takes on water at the dock in a U.S. port, he is assured that it meets EPA standards for chemical contaminants like benzene. When his ship uses its onboard watermaker to convert seawater to fresh water, however, those same standards don't need to be met. A U.S. Navy study conducted several years ago recommended that, because of the risk of chemical contaminants in the seawater used to make fresh water on board, the Navy should monitor and test for these impurities in the shipboard drinking water on its vessels. In my opinion, the same should hold true for U.S.-flagged commercial vessels.

There is no reason why mariners should have to drink water that is unsafe or unhealthful. To help solve chemical contamination issues, additional filters could easily be added to existing evaporation or reverse osmosis systems on board. As part of a commercial vessel company's International Safety Management procedures, regular maintenance or replacement of filters (in accordance with the water-maker manufacturer instructions) could be included. In addition, onboard water testing for contaminants and periodic third-party testing by labs ashore

would help guarantee that the quality of water made at sea meets EPA standards.

In the days before the Jones Act was passed, merchant mariners were often not provided clean and sanitary potable water. **U.S. Code Title 46, Section 10902 is still U.S. law, and gives merchant mariners on inspected vessels the right to petition to have the vessel declared unseaworthy if they feel the water on board is unfit to drink.** The U.S. government has established that safe drinking water must not only be disinfected, but essentially free of chemical contaminants as well. **Thirty-six years after the Safe Drinking Water Act of 1974 was passed, its time that our government address the chemical contamination of drinking water made aboard ship.** The EPA standards for clean water should apply to all American citizens including those who work on U.S.-flagged commercial vessels.

Till next time, I wish you all smooth sailin'.

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