

EXCHANGE

NEWSNOTES & TRENDS

The capsizing of the tourboat *Ethan Allen* in October of 2005 will have some impact on small commercial passenger boats and may even impact recreational vessels. The *Ethan Allen* capsized without warning on New York's Lake George with 48 persons onboard; 20 passengers died. Though not required to be inspected by the USCG since it was operating on an inland lake, the vessel passed the Simplified Stability Test for 48 passengers when it was new in 1966. The New York state department of Parks and Recreation has jurisdiction on the lake and accepted data from the last USCG Certificate of Inspection in 1979. The criteria at the time used an average passenger weight of 140 pounds (for protected waters – 160 pounds is used in other areas). Though several modifications were added to the vessel, a new stability assessment was not done nor required by the state of New York. After the accident, a sistership failed the stability tests simulating 48 passengers. The National Transportation Safety Board (NTSB) later determined that the vessel could safely only carry 14 passengers. Their conclusion was that the *Ethan Allen* was carrying over four times the safe passenger weight; 75% of the reason was due to certifying the modified vessel for too many passengers and 25% was because the actual average passenger weight was 38 pounds higher than the standard used.

Since the accident, New York state has adopted an average passenger weight of 174 pounds and the USCG voluntary interim measure recommends a weight of 185 pounds be used for stability tests. How does this affect recreational vessels? It's not clear at this point; according to the NMMA, the Coast Guard's intent is to apply the voluntary weight increases to

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Isolation or Polarization: Which is the Safest Transformer Installation?

By Capt. David Rifkin (USN, Ret.)

In this article we are going to sort through the ins and outs of transformer installation in a boat's electrical system. There are two installation systems—polarization and isolation—both of which are diagrammed in ABYC's E-11 standard. Each will be discussed with an emphasis on the safety of personnel on the boat as well as in the water around the boat. Here's a question to keep in mind while reading this article: Would you deliberately disconnect the green grounding wire from receptacles or appliances in your home?

The advantages of transferring power in this manner ultimately depend on how the transformer is wired into the system, but all transformers have at least some basic advantages. First, the polarity of the electrical system is established on the secondary side, meaning the relationship between Hot and Neutral is determined *on the boat* at the secondary of the transformer. You can see from Diagram 1 that the polarity in the secondary is independent of the shorepower connection (meaning reversed polarity in the pedestal will have no effect

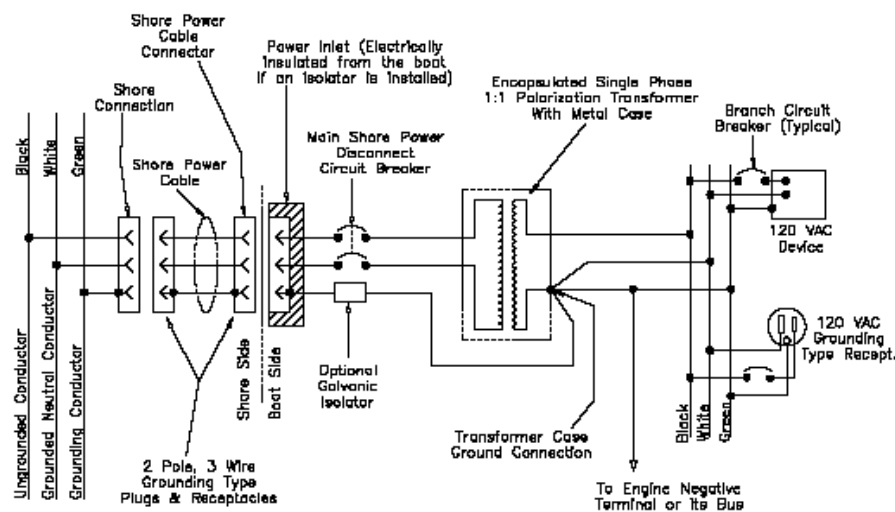


Diagram 1. In the above diagram, it doesn't matter how the ungrounded conductor and grounded conductors are connected to the primary winding. The polarity is determined by how the loads are consistently wired to the secondary winding. This is known as a "polarization system" in the ABYC Standards.

A transformer is a device that transfers power from a primary winding (input) to a secondary winding (output) through the process of magnetic induction. This secondary voltage is what powers the electrical loads on a boat without a direct connection to the electrical source ashore.

on the boat's electrical system).

Another advantage is safety. Without a transformer, an electrical fault to ground on a boat, *and* a problem with the grounding wire's capability to carry fault

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ON WATCH

Stay Alert to Possible Hazards on Boats and Equipment

The information from the Technical Input cards you submit is collated, reviewed, and published in the "On Watch" column.

If one of your surveys supports a previous "On Watch" report, make sure that you also report it. Conversely, if your survey fails to substantiate a previous "On Watch" report, send your observations to the Exchange. This will help readers determine whether the alleged defect is an isolated incident or a widespread problem. The Exchange will follow up with any subsequent reports.



HUNTER MARINE, VARIOUS MODELS FROM 24' to 46', VARIOUS YEARS. Survey on a 2002 Hunter 356 found numerous ball valve seacocks that had failed in the open position and were not operable.

Hunter Marine has issued a recall (USCG campaign number 060053T). According to Hunter, a particular brand of ball valve installed may fail under certain conditions or after an extended period of time. The suspect valves were manufactured by Marine Hardware and are most easily identified by their blue handles and a drain/grounding screw incorporated into the body (see picture). Failures have taken place when the ball valve stem corrodes prematurely leaving the handle unable to close the internal ball. If the valve cannot close, the connections could lead to water entry if a hose should fail or be removed. Hunter is supplying new ball valves and will coordinate haulouts with their customer service department. They also stress that they would like the old valves back and will reimburse shipping charges. More information can be found at hunter.com or by calling 800-771-5556.

NORTHERN LIGHTS GENERATORS, ALL. In the last On Watch, *Exchange* reported a problem on Albin Boats in which a Northern Lights generator was installed in a 2005 Albin Marine, 36'. The installer failed to connect the neutral and ground as required by ABYC. The submission noted that the Northern Lights generator installation manual specifies not tying the neutral and ground together. Bob Senter, training manager at Northern lights disputed that fact and sent the *Exchange* a copy of the manual that Senter says has been in use for over 20 years. He also said that boats destined for Europe do not have the neutral and ground connected and therefore, there is "not technically a right or wrong way." The manual he sent states: "There is no consensus of opinion on whether the neutral conductor should be connected to the bonding system (grounded) or not (floating ground). Grounding the neutral may increase electrolytic corrosion. Not grounding the neutral creates a potential shock hazard. The American Boat and Yacht Council recommends grounding the neutral at the generator for safety reasons, though this may shorten the life of the heat exchangers and other components. Alaska Diesel Electric heartily recommends grounding the neutral since personal safety takes priority over all other considerations."

RINKER YACHTS, 320 FIESTA VEE, 32, 2005. Engine compartment air intakes are inside the transom storage locker. Intake is restricted by the closed locker and further may be obstructed by gear in the locker. ABYC H 24.10.3. Each intake opening shall be on the boat's exterior surface."

Also, the fuel tank, label and fittings are completely inaccessible for inspection as no access port could be located, which is contrary to ABYC H24.10.3: "Tank connections, fittings and liquid level gauges and transmitters shall be readily accessible, or accessible through an access panel, port or hatch."

Randy Rinker of Rinker Yachts said the surveyor saw a vent for the transom locker; not for the engine intake. The engine compartment air intakes are on the side of the boat, tucked up under a fiberglass shroud and covered by a lower, making them hard to see. There are access ports for the fuel tank com-

ponents, he said, though they are not easy to find. The access port for the port tank is in the cockpit, under a storage tub. The starboard access is gained by moving the ice maker or refrigerator. An access cover is underneath.

SEAWARD PRODUCTS, PROPANE LOCKER. Newer propane bottles with overflow protection devices (OPD) that meet UL-58 are slightly too tall to fit the lockers and prevent the lid from closing. There is a possibility that propane could escape from the unsealed opening.

Tom Shultz, owner of Seaward Products said the company has a retrofit lid for the lockers and sells them at cost. He said Seaward also sells shorter, 1/2-inch-long stem adapters that go between the POL fitting and the tee to the gauge and regulator so newer tank valves with the inside and outside threaded POL fittings can be used. The new lid and adapter kit for the higher OPD tank is Seaward PN 80233. Seaward's phone number is (562) 699-7997.

SEAWARD SAILBOATS/HAKE YACHTS, 32', 2003. The overboard discharge fitting for the galley sink and bilge pump

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Vol. 22 No. 4

October 2006

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The “Seaworthiness” Warranty?

“Boats that sink at the dock will stop being built when underwriters stop paying for losses resulting from boats that sink at the dock.” Whatever happened to the Seaworthiness Warranty?

I hope that some discussion can result from my comment. This spring, I saw many boats that sank at the dock because of rain accumulation or just poor design. Self-bailing? Can’t someone figure out that if the boat is supposed to be self-bailing that the scuppers should be well *above* the waterline and so should the deck? Shouldn’t the deck be sealed with something other than plastic press fit hatches? I handled one the other day that had scuppers below the waterline, a large 24” press fit hatch in the engine well, two 8” Beckson plates in the deck, and hatches to the bilge that were not dogged down. What the??? Why did the boat sink? It got water in it.

Daniel K. Rutherford, IAMI-CMI
Cape May, New Jersey

Mysterious Halos

We have taken continuity measurements on black bottom paint and it is, in fact,

non conductive. The technical director at International Paints told me that a couple years ago also. Paul Fleury does not talk about what the electrons do when they “enter” the paint[Bridge to Bridge, July]. They have to be reacting with something to keep a current flowing. This is the key to explaining the mechanism.

What we have discovered is that the cuprous oxide paint gives off copper ions. The copper ions are what discourage organisms from attaching to the surface and give the paint its antifouling capabilities. They found that putting copper oxide in the paint, rather than copper dust, produced far more copper ions in the vicinity of the painted surface and was therefore more effective.

When these free copper ions come in contact with a bonded metal fitting they will pick up electrons and form pure elemental copper atoms, and then proceed to “plate-out” on the fitting and surrounding area. As the process progresses, a copper skin begins to form and grow outwards from the hull fitting. This skin is being protected from oxidizing (corroding) since it’s really hooked up to an anode via the metal fitting and the bonding system. Organisms love elemental copper! Both calcium and tiny organisms

will attach to this thin copper skin and the result is the discoloration of the paint (i.e. halos). Also, the copper skin (anywhere in the vicinity of the halos) is, in fact, conductive! With every two electrons picked up by a copper ion, a zinc ion is ejected from the anode. This additional load on the anodes can be dramatic, resulting in excessive anode usage. Jim Shafer scraped off a bottom with these halos and part of the copper skin was still attached to the little animals!

Paul got the fix right but I would add that you first should remove the copper skin from the affected area. This usually means going down to the epoxy base coat (if there is one) or down to the gelcoat. We also recommend leaving an inch or two gap around the hull fitting, which will be coated directly with the same barrier that’s applied to the metal fitting. It just puts a barrier between the hull fitting and the paint to discourage contact with copper ions (bottom paint is very porous compared to epoxy).

When protected by a barrier, you can apply the antifouling paint to the entire surface, including the hull fittings. His fix may work fine in many cases.

James Shafer
Capt. David Rifkin (USN, Ret.)

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are routed into a plastic tee, which is threaded onto the through-hull fitting on the port side. The through-hull fitting is just above the boot stripe. The bilge line is connected to the top of the tee and when heeled, water runs in to the through-hull and enters the bilge through the Rule 350 submersible pump. ABYC standards require all fittings that penetrate the hull below the maximum heeled waterline be equipped with a shut-off device operating through a 90 degree arc.

Dave Brady, sales manager for Hake relayed the concerns to owner Nick Hake who said the 26 has a high-quality diaphragm pump with a built in check valve. As for as the through-hull, he said there is no risk from water backing up into the sink drain as the hose travels straight up to the sink. The bilge

pump connection is safe because the check valve in the bilge pump prevents back flooding, he said. However, after researching the HIN, Dave called back to say the boat in question is an older 25-foot model. The 25-footer, he said, did not come from the factory with a bilge pump as standard equipment, and could have been installed after the sale, which would explain why a non-diaphragm Rule 350 pump was sighted. When asked about the ABYC requirement for a seacock, Dave said that Hake does not necessarily build to ABYC standards and felt that the current arrangement was adequate.

VOLVO PENTA TAMD 74 AND TAMD 75 DIESEL ENGINES, ALL. Vessels equipped with these engines may suddenly shift gears without operator involvement.

According to Rick Pruitt, director of

marine diesel support for Volvo, the TAMD 74 and TAMD 75 engines are controlled by an electronic shift and throttle system (fly-by-wire) that is designed to respond to the operator’s movements of the control lever. Several reports have been received of unintended gear shifts – both forward and reverse – without operator input when the lever is in the neutral position. According to Rick, their investigation revealed that voltage on the electronic signal between the lever control box and the engines can drop and cause unintended gear shifts if the connections within the system become loose. He said Volvo has begun a campaign to secure the connections at no charge to consumers. He also said that Volvo is warning operators not to leave the helm area while engines are idling in neutral until the repairs have been made.

Civil Liability of Marine Surveyors

What You Should Worry About and What You Should Ignore . . . *A Guide to Helping you Avoid Becoming Entangled in the Legal System. Part I*

by Phil Brown, JD, DPA, SAMS-SA
Certified Marine Investigator

A national LEXIS search discovered 18 cases involving marine surveyors; nine of them were pre-purchase surveys; three were insurance surveys; one was a finance survey; one was a damage survey; and four were commercial ocean surveys. Of the 18, nine found the surveyor liable or summary judgment was denied; six dismissed the surveyor or found in the surveyor's favor after a trial; and the disposition of three is unknown. The causes of action used against marine surveyors were breach of contract, breach of a warranty of workmanlike performance, negligence, and misrepresentation.

A further search, this time on the SAMS message board, discovered another 23 cases spanning 26 years. Seven of these were 15 years old or more; nine were disposed of in the last five years; and four in the last three. Of the 23, seven were dismissed; eight were settled; one went to judgment; four are pending; and the disposition of three is unknown. Five resulted from water or fuel leaks; two from rot; three from blisters; two from UTT testing; one from alleged misrepresentation; one from CO; six miscellaneous; and three from causes unknown to the author. Seven sought in excess of \$10,000 and only one involved loss of life. One thing that all of these legal actions had in common: many, perhaps most, could have been avoided.

Principles of Civil Liability

Shipping and boating accidents involving extensive property damage, loss of life and environmental cleanup often lead to litigation. By virtue of what they do, marine surveyors can be caught in the middle of this litigation. The role of the marine surveyor and the importance of the profession to boaters were noted by one Texas court: "A marine surveyor, particularly one who engages in the burgeoning pleasure boat field where a majority of boat owners are not edu-

cated and experienced mariners, performs an indispensable service, often a life-saving service to his clientele. Whether the survey be conducted for insurance purposes or for the purchase or sale of a vessel, this examination may be, in all likelihood, the only one made by an experienced hand. The landlocked public can perhaps rely on workmen to inspect and repair most household appliances and not be placed in jeopardy of serious injury or death, at least in the majority of instances, in the event that the repairman inspects in a cursory manner or performs sub-standard work. But reliance by laymen on such skilled professionals as marine surveyors . . . [is] one of which the law must take cognizance in a proper case."

With such a vital role goes great responsibility. Though the Texas court did not state what duties it required of marine surveyors, it did say that, "given the social utility of surveyors, courts should not assess liability against them blithely." The litigation involving marine surveyors is based most frequently upon the legal theories of negligence, misrepresentation, and breach of contract (including breach of an implied warranty of workmanlike performance).

Breach of Contract

Privity: With whom is your contract?

It was firmly established in the nineteenth century that only a person in "privity" could sue on the contract. In this context, privity refers to those who exchange the promissory words or those to whom the promissory words are directed. The doctrine of privity made it clear the only parties who could sue on a contract were the parties between whom the bargain was made. It was a theoretical device of the common law that recognized limitation of liability commensurate with compensa-

tion for contractual acceptance of risk.

Applied in the marine surveying context, privity means that the only person who can sue the marine surveyor for breach of contract is the other party to the bargain. In this strict sense, that would be the party who contracted for and is paying for the survey. In a court that recognizes it as a requirement, lack of privity is a legal defense that bars an award of damages. Therefore, under the privity doctrine a marine surveyor would ordinarily have no contract liability to the seller of, insurer of, or lender for a boat on a pre-purchase survey commissioned by the boat purchaser. Likewise, there would be no liability to boat purchasers on a seller's survey. Under this doctrine, third parties cannot sue the marine surveyor because they are not parties to the contract. Damage surveys initiated by the insurer or lender and pre-purchase surveys shared (with the surveyor's knowledge) by the seller and the buyer are a different matter, making them all contracting parties.

Privity brings greater certainty to the marketplace in which the surveyor operates and limits the surveyor's risk of liability to parties with whom there has never been a business relationship. It also limits liability in the monetary sense, because the surveyor is not put in the position of acting as an insurer for damages to others outside the business relationship. Thus, from the perspective of the marine surveyor, a privity requirement is good.

But over the last 60 years privity—though its existence endures with some courts—has been subjected to relentless attacks, causing some to say it has been eroded to the point of extinction. One contract law theory that has contributed to serious erosion of privity is the concept of third-party beneficiaries.

Next issue: Third Party Beneficiaries and Performance Standards □

The International Association of Marine Investigators

“ I A M I N E W S ”

N E W S L E T T E R

A Message from the President



Dear Fellow Members:

It is hard to believe we are reading the third quarter edition of the *Exchange*. Where has the year gone? Soon it will be February 25th, 2007 and we will be starting the 17th Annual Training Seminar in Panama City Beach, Florida. The Board of Directors is very focused on ensuring this seminar provides the quality of training IAMI members have come to expect. It will also be another chance for members to obtain their Certified Marine Investigator (CMI-I) certificate. It is never too early to start the ball rolling if you are planning on taking the CMI-I examination.

This time of year also means there is only one more chance to send in your investigator of the year stories. Any IAMI member who has participated in a case that has led to a major arrest or discovery, particularly as a direct result of IAMI training or networking, should submit the story to the *Exchange* for publication. Stories can be emailed directly to Bob Adriance at badriance@boatus.com or mailed to: Technical Information EXCHANGE, C/O BoatU.S., 880 South Pickett Street, Alexandria, VA 22304.

Since the last issue of *Exchange*, IAMI has been busy working with several organizations (IAATI, NASBLA, SAMS, NAMS, NMMA, ABYC, USCG and FMIU) to ensure positive progression in the recruitment of new memberships, retaining existing members, developing stronger partnerships around the world on key issues such as the 17-character HIN, providing necessary training opportunities, and improving member services.

One thing that has been driven home to me through my involvement with our members: IAMI is not a proper noun—it's a verb. This is proven by the many regional training seminars that have taken place or will take place this year across the United States, Europe and Canada. It's also evident on the Fraudfighters reflector, which has also been busy with members helping other members resolve investigative concerns. IAMI members are doing, not just talking, and that is what success is all about. The men and women who make things happen are too numerous to mention here, but everyone in IAMI has benefited by their efforts. These members didn't wait for something to happen, they made it happen. I am very proud of the hard work and dedication of IAMI members around the globe who have stepped up to the plate and have gotten "involved."

I want to share a quote that I read while attending the IAMI Europe conference. I think it best describes who and what the success of IAMI is all about. The quote reads, "The mind is like a parachute, it only works when it's open."

I look forward to seeing all of you in Panama City Beach, Florida next February!

Sincerely,

Sam I. Bean, CMI-1, President

News from the Directors

From Mike Smith, First Vice President: With rising fuel prices adding to the cost of boating, we can expect to see more boat fires, property theft, etc. This will mean more investigations for law enforcement and more claims for marine insurance companies. IAMI plays a critical role by educating our members through the training they receive, which helps bring these cases to a successful conclusion.

Having been a member since 1993, I have had investigations that led to other states and countries where an investigation is almost impossible without someone on site to help. I have yet to make a phone call to an IAMI member asking for assistance where I wasn't given full cooperation. That is what IAMI can do for you as well.

You can help to keep IAMI moving forward. Whether it is becoming a board member, regional coordinator, committee member or just writing a letter to your legislatures supporting things like 17-digit hull identification numbers or mandatory titling for vessels and outboard motors, you can make a difference!

From Martin Aberg, Second Vice President: IAMI Europe held its 9th Annual Conference on September 27 – 28, 2006 at the Ariadne Hotel in Stockholm, Sweden. There conference was the largest ever in Europe, with 84 delegates from 15 countries. It was generously sponsored by the Swedish Insurance industry.



European Training Conference, 2006

Mrs Annika Lundius of the Swedish Insurance Federation opened by welcoming delegates and talking about the growing crime problem in the Baltic. Other speakers included Officer Stig Lindeberg from the Board of Boarder Guards in Estonia, Officer Kent Widing who is in charge of the Interpol, Stockholm, Sweden, Officer Arek Skrzypczak from the Polish Police Department, Officer Mikael Lindgren from the Swedish Customs, and Charles E. Meacham,



Martin Aberg and the incoming Chairman, Patrick Helmsmoortel

ICL Investigations inc. in the United States. Patrick Helmsmoortel from the Belgium River & Marine Police talked the situation on the European canals. Peter Siegfried from Marine Claims Service, Hamburg, Germany talked about GPS tracking and Jonas Bjurström from Pilot Fish, Sweden

gave information on the use of GPS tracking systems. Gerhard Welly, Data Trace DNA, Austria talked about DNA marking of different materials and how they can be traced. Past IAMI

president Pat Rowland informed us about 17-character HIN and IAMI President Sam Bean showed pictures and films from hurricane Katrina. One especially important topic was a discussion on IAMI Europe registration, which will be done in Belgium. Within the next few months, IAMI Europe will become a chapter of its own.

IAMI Europe Steering Committee Chairman, Martin Aberg resigned as the chairman of IAMI Europe and was replaced by the vice chairman, Patrick Helmsmoortel. Martin will remain on the Steering Committee as a past chairman for the next three years. Two new members were elected to the Board: Jayson Sibley from C Claims adjusters in Mallorca, Spain and Simon Lofting from the Essex Marine Police in Great Britain.

In other business, IAMI President Sam Bean gave the 2006 President's Award to Wolfgang Benner "In recognition of his outstanding efforts and contributions to the fight against marine crime and his continued support to the IAMI."

I'd like to thank a few of the people who made this conference a success IAMI "mom" Ronnie Rowland, Goran Juninger, Carina Birking, Niklas Antonsson and Stefan Spendrup and our assistant Carina Norberg-Schmidt. Next year IAMI Europe conference will be held in Italy.

From Bill Dobson, Regional Coordinators and Membership:

One of my goals is to have regional coordinators in each of the six IAMI regions as well as have at least one state coordinator from each state. My stretch goal is to have two state coordinators—one each from law enforcement and non-law enforcement—representing each state. I am happy to report that we have made great strides in this effort, with 78 coordinators having volunteered. There is also a membership coordinator in the Bahamas! All but 13 states are now represented. If you live in Arkansas, W. Virginia, Kentucky, Maine, Vermont, Utah, Colorado, Minnesota, Alaska, Montana, North

Dakota, South Dakota, or Wyoming your help would be very much appreciated. Please "Get Involved!" Email me at bdobson@amtus.com with the names of any prospective members who would be willing to serve as a State Coordinator in the aforementioned states.

Plans are in full swing for regional training sessions in Yorktown, Virginia for October 2006, and in Hanna City, Illinois for May 2007. Just to mention a couple. We will update the IAMI web site with training opportunities and information as soon as the arraignments are complete for each session. So if you have not checked out and logged on to the IAMI web site, (www.iamimarine.org), please do so. It is the best tool we have to keep you informed.

From Eric Lundin, Training and Public Education: Congratulations to Martin Aberg and the entire IAMI Europe Steering Committee for a fantastic European Training Conference September 27 and 28, in Stockholm, Sweden, with a thorough overview of marine crime in Northern Europe and the Baltic states, plus some networking over great scenery and food. A very special congratulations to our newest (and only second

News from the Directors (Continued)

European) Certified Marine Investigator, Simon Lofting of the Essex Police Marine Unit!

Regional training sessions are being proposed and scheduled in a number of areas throughout North America, as well as internationally. Even more sessions are in the works for 2006 and 2007; by the time this goes to press, you should have further concrete information on a Virginia regional training session, planned for late October. Enthusiastic state coordinators in Illinois are putting together training for early May, 2007; Michigan coordinators are gearing up for training early 2007; and training with CMI testing has been discussed for November 2006 in the Vancouver, BC area. If you or your agency/business would like to put on IAMI regional training, please contact me or Bill Dobson directly (elund90@aol.com) so we can get started.

The Board of Directors is putting together information on

how to set up an IAMI regional training session; our goal is to maximize resources, involvement and attendance while minimizing costs. To that end, I am compiling a list of active IAMI-certified instructors and their areas of expertise. Current IAMI certified instructors, please re-submit your information, including instructor number, areas of expertise, etc. to me. Anyone wishing to become certified as an instructors in HIN 101, Marine Theft/Fraud, or other areas can complete the instructor applications found on the website and forward them to me or through IAMI Headquarters. Several applications are being processed now—I look forward to many more!

From Judy Vollbrecht, Marketing: IAMI is working hard to bring together a great training conference for February, 2007 in Panama City Beach, Florida. This is a beautiful place, especially in February. Come for some training and networking, and get involved. This is what IAMI is all about. Please go to iamimarine.org to see some of the upcoming events. □

China is Calling

Identifying Stolen Boats in an International Marketplace: Will We Still Be Able to Recognize Stolen Boats in the Future?

By Larry Burden

China is calling and we had better listen. Its no secret, the economic boom in China is impacting the world in ways we could never have imagined 20 years ago. Hundreds of thousands of manufacturing jobs in the so-called industrialized world are disappearing faster than we can rush to Wal-Mart. Initially it was the cheaper goods that were attracting our spending dollars but now the boat manufacturing industry has joined other large manufacturing industries beating a path to China and taking jobs with them.

Beginning in 2006, Brunswick Corporation is expected to produce 5,000 SeaRay boats annually in China at their new plant in the boat manufacturing industrial zone of Zhuhai. Brunswick is not the only boat manufacturer who has recognized the enormous advantages China provides with its cheap labor and slack environmental and worker protection regulations. Other big players in the marine manufacturing community such as Taiwan's Hershine Marine and Germany's ZF

Marine are manufacturing in China as well.

With a population of 1.3 billion people, many of whom work for pennies an hour, the allure of China to any type of manufacturer is overwhelming. If Brunswick Corp. has made the jump to China you can bet that other boat and engine manufacturers will follow suit. What this will mean for the marine industry in North America and Europe will be a decline in manufacturers and jobs in the boat building industry. If you doubt what I am saying, take a look at other manufacturing industries and consider reading "China Inc." *How the Rise of the Next Superpower Challenges America and the World* by Ted C. Fishman. In his book he explains in detail the stark realities of the Chinese rush to modernization and the impact it is having on the United States and the rest of the world. For example, so many people are migrating to industrial centers to find work, that over 140 cities now have populations of a million or more. The country has to build new housing and infrastructure that is equivalent to building a city the size of

Houston Texas *each month!*

Many large corporations are being lured to China believing that they can get a slice of that 1.3 billion consumer pie, but what many fail to recognize is that most of the Chinese consumers have very little purchasing power, let alone free time for recreation, and are not likely to be buying pleasure craft any time soon.

Another issue that has to be of concern to all manufacturers is that if you are going to build in China you are going to have to get into bed with the State. You can forget about intellectual property rights—the country's legal system is ineffective and heavily slanted to protect Chinese interests. China is famous for borrowing corporate technologies and then backing Chinese corporations that produce a very similar product only cheaper than the original. Ask the automobile industry!

Boatbuilding is a very labor intensive
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CHINA IS CALLING, *from page 7*

trade and the largest cost factor in the industry is wage and benefits. China is aggressively marketing the advantages of setting up business there. Some of the competitive advantages they offer include:

- An unlimited supply of cheap laborers who are willing to live on site and work long hours. A manufacturer's labor costs are only 5% of what they are in the U.S.
- Fewer site planning costs and environmental regulations.
- The availability of cheaper fittings and hardware essential to the manufacturing process. Many manufacturers outside of China are already purchasing product from Chinese manufacturers. As more western manufacturers move to China, higher quality components will be produced in China, thereby providing even more cost reductions for manufacturers.

It's not just boats under 30' that are being built in China, there is a growing industry for megayachts as well. The United States Department of Commerce conducted a survey in 2001 and found over 250 boat builders in China producing a wide variety of products. Though the country has an enormous population, it presently has virtually no home grown consumer market. Therefore existing Chinese boat builders have to export their products and this has led to cost cutting, price gouging and low-quality products. As China learns from western manufacturers how to build better products, they will improve their ability to compete and then undercut existing manufacturers.

Not only are western boat builders looking at China, the Chinese government is actively looking for manufacturers around the world to partner with them in creating companies. All you have to do is Google "boatbuilding in China" and you will find government web pages soliciting prospective manufacturers such as one from The Economic and Commercial Section of the Peoples Republic of China in Vancouver. Their site has an advertisement that reads a Chinese Shanghai

based company looking for Canadian partner jointly manufacture aluminum boat. *"The Chinese company looks for opportunity to form a joint venture company in Shanghai, the leading metro city in China, to manufacture 5-12 meter length aluminum leisure boat. Details are as follows. . ."* Included in the details are the six beneficial points for the partners who contribute to the joint venture in aluminum boatbuilding with Huayi Group, Shanghai PRC. The beneficial point that caught my eye was the following:

"Oversea party contributes "Technical transfer" involving (a) Patents, complete technical documents & drawings for manufacturing the qualified products (b) personnel training includes training schedule in details. (c) technical support from beginning to the end of production. Three items above must put together as technical transfer to JV."

This past April, 195 delegates from 20 different countries attended the Boat Tech China 2006 conference in the city of Guangzhou; included on the speakers list were John Adey, the Technical Director of the American Boat and Yacht Council, and Jeffrey Seah, General Manager of Brunswick Asia Pacific Group. There is lots of interest getting into the Chinese market by nearly every aspect of the marine industry. The only voice that appears to not be at the table is IAMI's voice! Take a moment and surf into their web site at www.boat-techchina.com and download the Boat Tech China Report; it is interesting reading.

The fact that increasing numbers of western marine manufacturers are going to move some or all of their operations to China is a forgone conclusion; the question we need to ask ourselves is whether we are going to be left behind in our efforts to combat and investigate crime. If we are not opening our eyes to global issues that impact us and make an effort to identify future trends that will impact us negatively as well as positively than we will continue to play catch up.

In my opinion, we have to be at the table addressing issues such as this, or our jobs will become more difficult than they already are. It is one thing to say that foreign based manufacturers have to comply with our standards in order to compete

in our markets. But the reality is that many products are being imported into North America and Europe that do not comply now. Show me one government that has adequate staff inspecting imported goods for local regulatory compliance. We have witnessed a trend in the marine engine industry where permanent identification on these products has been replaced with easily removable stickers and nothing has been done about it. I have attended boat shows in Canada, Germany and the United States and at every venue I have seen products on the show floor that do not comply with respective regulations. What will we be faced with when the existing market becomes flooded with low cost Chinese products?

If nothing else, the emergence of Chinese products flooding the market should be a wakeup call for the hull identification number (HIN) issue. Whether North America likes it or not, we now have a 14-character HIN, which is a bad identification system. Europe has no effective control over the issuance of manufacturer identification codes (MIC) and the design of the HIN is not conducive to law enforcement computer systems, resulting in unacceptable inaccuracies on stolen boat data entries. We are already seeing products from China and other countries such as South Africa coming into the North American market without HIN's. What will it be like in a couple years? We have to get an effective global standard approved for a new 17-character HIN system, one that will meet the needs of the enforcement community verses making an already bad HIN system even worse. But I fear the HIN issue alone will continue to drag on and will not be resolved before the flood gates of outsourcing to Asia overwhelm this industry.

If we as an international association do not become involved now in the global trends that impact our respective fields of expertise, we will find ourselves in the position where we used to be able to teach frontline investigators how to identify stolen marine products and will fail to meet the needs of our membership and this industry. China is calling and we had better start listening!

current, will result in all grounded components on the boat rising in potential (voltage) together. This shouldn't be a problem for anyone on the boat if it is properly bonded internally since there will be no dangerous difference in potential between bonded metal components. But, there is a path back to the source from the electrified underwater metals via the grounding stake, representing a danger to anyone in the water near the boat. (See Diagram 2.)

However, if a transformer is installed on the boat (Diagram 3), there would be no path for this fault current to return through the water to the source, since the source is the secondary of the transformer on the boat. In other words, fault current will only return to its own derived source and not to some other source, like the service transformer ashore.

Additional advantages of all transformers include protection of 120v loads from a "loss of neutral" situation in a 240v service, as well as the ability to adjust voltage to 240v when using a 208v service.

Now, let's clear up some of the terminology confusion when it comes to these devices. The ABYC Standards refer to two types of transformers: Isolation and Polariza-

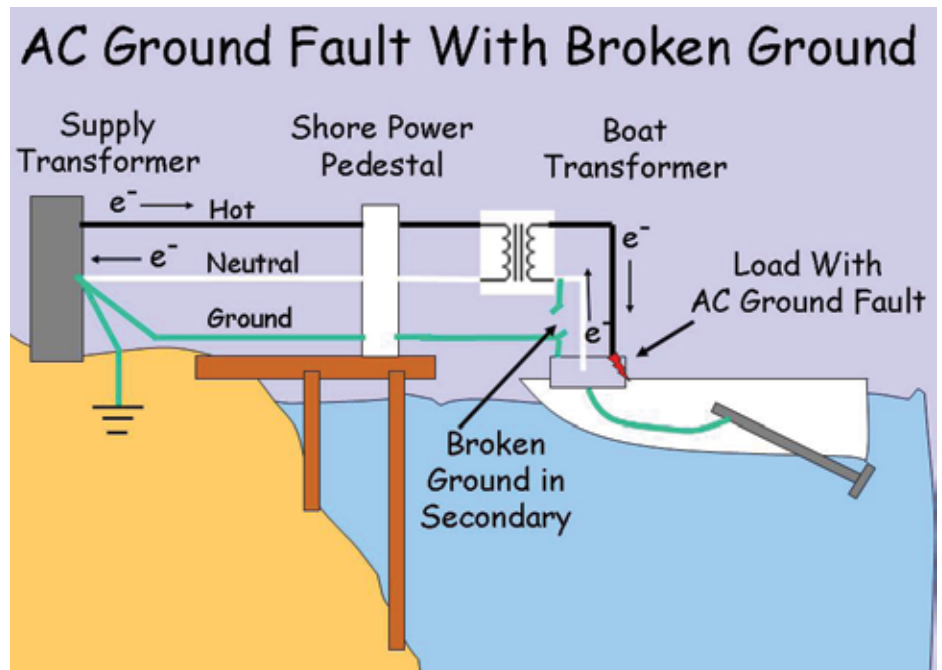


Diagram 3. In this case there is also a ground fault and an open grounding connection to the secondary of the transformer. Notice that there is no water current path. Even though the underwater metals will rise in potential, there is no path for current to flow back to its own source, in this case the secondary winding of the boat transformer. There is no fault current flow in the grounding wire to the shore transformer either because the shore transformer is not its source.

tions of the transformer. This shield must be able to withstand a 4000VAC potential for one minute applied between the shield and all other components including wind-

shield that does not meet the voltage nor fault ampacity requirements specified for the Isolation Transformer. This is okay; we're just establishing that there are two different devices out there based on ABYC definitions.

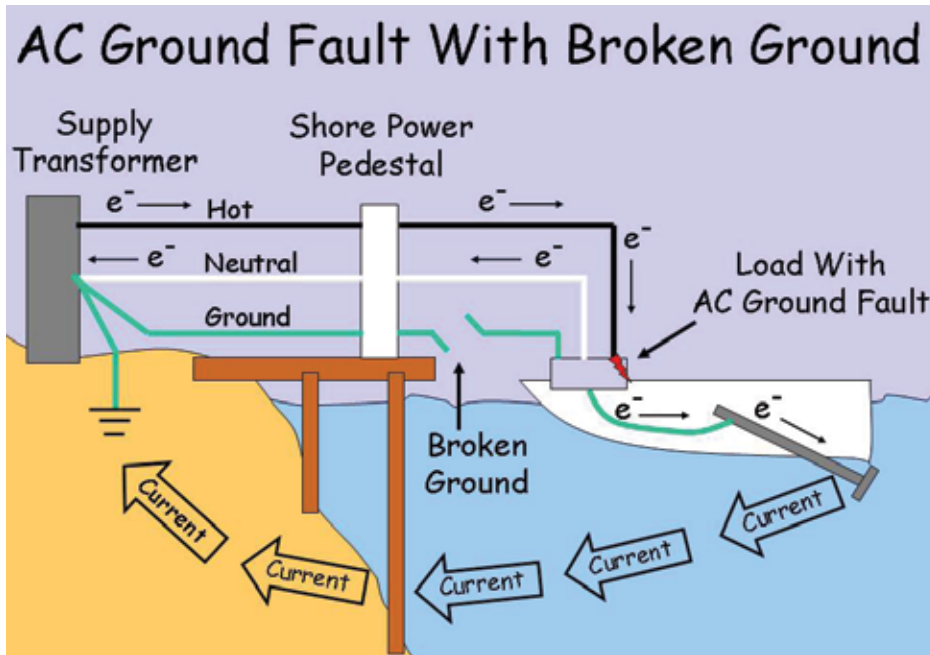


Diagram 2. In this case with a ground fault and an open grounding connection to the shore transformer, a water path for fault current exists. This water current is seeking return to its own source ashore.

tion. To be designated an "Isolation Transformer" by the ABYC Standards, it must have a metallic shield installed between the primary and secondary windings that is electrically insulated from all other por-

ings, core and the outside enclosure.

What ABYC defines as a Polarization Transformer is a dry-type, encapsulated lighting transformer, which may have a

Aside from the devices themselves, there is also a difference in how they can be installed in the electrical system. To distinguish between the transformer itself and the manner in which it is installed, ABYC uses some subtle terminology. The schematic diagrams in E-11 refer to both an Isolation Transformer *System* and a Polarization Transformer *System*. Note the word "system."

The major difference between Polarization Transformer and Isolation Transformer Systems is the green grounding wire: In all of the Isolation Systems in the ABYC standards, there is a break in the grounding wire between the primary and secondary sides of the transformer. With Polarization Systems, the grounding wire's continuity is maintained from the shore grounding connection to the secondary side of the transformer. You may now be able to see the subtle meaning of the term "Isolation" when it comes to installation of transformers according to the ABYC standards. It simply means that the shore grounding system is isolated from the boat grounding system.

Continued on page 10

Another important point: The grounding connection between a source and a load is there for one reason; to provide a low impedance (resistance) path for fault currents to flow back to the source to reduce touch potentials and cause a device to interrupt power to the faulted circuit. This is how we provide for personnel safety during equipment operation. Note

such that the primary conductor may fault to the transformer case). With this fault, there is no *effective* path for fault current to flow in a grounding wire back to the source ashore. The fault current cannot travel in the secondary grounding wire back to the secondary since the ultimate source is the transformer ashore, not the secondary winding of the transformer on the boat. Remember, current will only flow back to its own source.

Many proponents of the Isolation System claim the Polarization System depends on the existence of a good grounding path back to the source ashore to work properly. This is true. However, if the grounding connection of a Polarization System is broken you end up with an Isolation System! In other words, when a transformer is purposefully wired as an Isolation System, the ground is broken intentionally by the installer. The installer is *intentionally creating* the same condition that Isolation System proponents argue is the reason Polarization Systems are not safe!

The grounding wire from the boat's grounding system back to the service ashore is put there for safety. The establishment and maintenance of this connection is one of the principal tenets of the Grounding and Bonding section of the National Electric Code, Article 250. Isolation Systems deliberately break this vital connection in order to mitigate potential corrosion damage. Every boat with an Isolation System is missing this safety connection.

Note that the text of paragraph 11.9.1.3 of ABYC E-11 (excerpted below) actually gets it right and is completely consistent with the NEC. This paragraph explains that the grounding path must be able to carry fault current back to the source regardless of whether the fault occurs in primary or the secondary. However, the Isolation System diagrams in E-11 do not reflect the requirements of this paragraph.

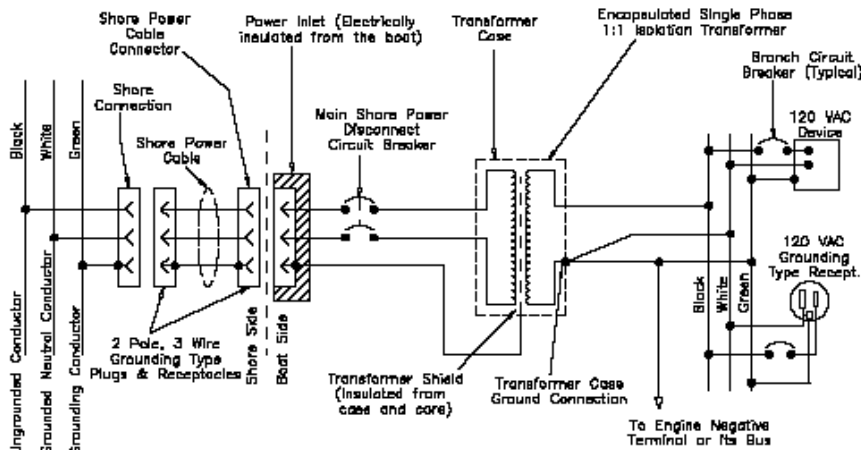


Diagram 4. This is an isolation system from the ABYC standards. The primary grounding wire is connected to the shield, and the secondary grounding wire to the transformer case. Do you see that there is a definite break in continuity between the shore and boat grounding systems?

that the terms grounding and bonding are often used interchangeably. To be technically precise, a grounding wire refers to a connection to earth itself (e.g. through a ground stake) while a bonding wire connects metal enclosures of electrical equipment together which includes the green wire normally referred to as the "grounding wire."

The logical question: Why design a setup that intentionally breaks the safety grounding connection?

The answer: To prevent the flow of galvanic DC currents between the boat and dock grounding systems, which can result in excessive sacrificial anode usage and corrosion of underwater metals. *When the grounding wire continuity is broken, safety is sacrificed for the sake of corrosion protection.* Here is but one of many examples of how safety is adversely affected by an Isolation Transformer System. Please refer to Diagram 4 above and the following paragraph.

In Diagram 4, let's suppose that a fault occurs such that the transformer's case becomes energized from the primary side ungrounded (hot) conductor. (Based on conversations with a senior electrician at Ward's Marine Electric, it is not uncommon to find loose connections to the primary, or chafed primary conductors,

Also, if the transformer case goes up in potential (voltage) from a primary-to-case fault, look at what's also attached to this case: All the underwater metals attached to the engine negative ground! Now there *is* a path back to the source ashore, and yes, again, it's through the water. This is because the source of the fault current is the transformer ashore, and this fault current's only path back to its origin ashore is through the water. In this situation, there is a significant danger to anyone in the water (particularly in freshwater; the topic of a future article...) and to anyone in the boat who gets between something attached to this grounding system and something that's making contact with the water and not bonded to the system (e.g. an isolated engine block or shaft).

Now look at this same fault (the primary-to-case fault discussed above) as it might occur in Diagram 1 (the Polarization System). Can you see how the fault current will now be carried directly back to the source ashore via the green grounding wire? This will likely cause a circuit breaker on the primary side to trip, cutting power to the electrical fault. *This is the main reason why the polarization setup is safer than the isolation setup.* For this reason, both the NEC and the ABYC require that metal enclosures of all electrical equipment be bonded (grounded) together.

11.9.1.3. The shield and its connection are to be of sufficient ampacity to provide a sustained fault current path for either the primary or secondary windings to ensure operation of the main shore power disconnect circuit breaker when subjected to a fault current level in accordance with TABLE V-B.

Looking again at Diagram 4, it's clear that a fault between the secondary windings and the shield cannot result in any fault current flow directly back to the secondary winding via a grounding wire, since the shield is only connected to the primary side ground. In fact, if this fault situation were to occur, the dock grounding system, along with the underwater metals of any boat properly connected to it, would go up to the same potential as the secondary grounding system. This would result in a water current path since the fault current is trying to get back to the secondary of the transformer on the boat. The exact path would be from hot side of the secondary, to the shield, to the dock grounding system, to underwater metals of boats hooked to the grounding

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passenger vessels and not to recreational vessels. But the USCG is also in the process of preparing a rule that would amend its regulations to address the stability issues caused by increases in passenger and vessel weight. This rule would “apply to the same group of small vessels covered by the voluntary procedures...as well as all pontoon vessels,” according to the Coast Guard. The problem is that recreational boat manufacturers don’t use actual passenger weight to determine stability; instead, calculations are based on boat and machinery weight, displacement and other factors. Similarly, pontoon boats use calculations of maximum load capacity based on either the geometry of the pontoon tubes or by conducting an immersion test. Passenger weight is not used. The USCG capacity and labeling regulations apply to most recreational monohull boats less than 20 feet in length, while ABYC standards apply to boats less than 26 feet in length. The NMMA has sent a response to the Coast Guard and is hoping for clarification.

Marine surveyors who work with small commercial T-boats have already seen changes. In one case, the owner of a small captained charter trawler on Lake George was told his capacity would be automatically cut by 25%. Kirsten Trego, a marine surveyor and former USCG inspector in New York said that so far she has seen no changes in the way authorities scrutinize recreational boats, though small passenger boats now must prove stability in addition to the 25% weight reduction.

At least one surveyor has come up with a potential solution to both passenger and recreational boat overloading; a loadline similar to the Plimsol line used by ships. The idea is that just a glance at the line will indicate if the vessel is overloaded. Trego agrees that it’s a good idea, but has seen first hand how boat owners over the years change the waterlines of their boat. The loadline mark, she says, would have to be permanently etched into the hull.

Smoke alarms are not required by the ABYC on recreational boats yet, but one man is glad his boat was equipped with one. In January of 2005, Freddy Vanderverre was asleep aboard his Cal 39 in

Jacksonville Florida when he was awakened by a smoke alarm. A fire had erupted at the base of his navigation station due to an electric heater that was too close to the wooden base. Mr. Vanderverre was able to put out the fire with an extinguisher; though he was not injured, the boat was significantly damaged.

Damage to fiberglass tanks due to the inclusion of ethanol in gasoline has been well documented and this fall, there may be additional problems with ethanol. One company that makes non-toxic antifreeze—commonly used for winterizing engines and water systems—is now adding ethanol to its formula. This could be a problem for boats with fiberglass water tanks and possibly even stringers and bilges if the solution is splashed into bilges to prevent freezing, as some boat owners do. Additionally, ethanol in contact with flexible water pump impellers could weaken them or shorten their lives.

Chris-Craft is expanding their facilities and opening a second manufacturing location in Kings Mountain, North Carolina. Yachts over 30 feet will be manufactured at the new facility while those under 30 feet will still be manufactured in Sarasota, Florida. For more information, contact Chris-Craft at (941) 351-4900.

A marine UL listing is an expensive proposition, as most marine products are manufactured in relatively small numbers. Marine manufacturers will often design and build their products to meet UL requirements but don’t pay to actually have them tested. And sometimes there are even more requirements than just the UL listing. As an example, ABYC A14.5.4 says, “[vapor] detectors shall be certified by an independent third party to meet the requirements of UL 1110, Marine Combustible Gas Indicators.” According to a spokesman at Xintex/Fireboy, their vapor detectors are not UL approved, but “meet the requirements.” Similarly, according to Brian Tofeldt, engineering manager for Guest, their battery chargers are not UL marine approved but are ignition protected for installation in gasoline engine spaces. Brian said that UL 1236 listing by itself does not mean a charger is ignition

protected—that’s a separate test. Brian said that Guest chargers are fully potted and are labeled “ignition protected.” But Brian said that, due to a manufacturing oversight, some of the chargers were not labeled though they were still ignition protected. Charles Industries, on the other hand, labels their battery chargers both UL 1236 and ignition protected.

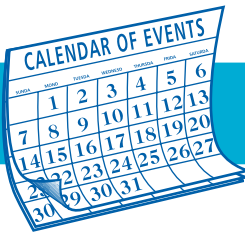
So where does this leave surveyors? If say, a potted charger is unable to create a spark or the heat necessary to ignite vapors in an engine compartment, should it be condemned because it’s not labeled as ignition protected? How about a unit that is labeled as ignition protected, but not UL listed as required by ABYC? It’s a tough call sometimes, but most experienced surveyors say that it’s wise to note that a unit is not in compliance with whatever the standards call for and allow the boat owner to make the decision whether or not to replace it.

Have you read your HMO insurance policy lately? Probably not. An insurance policy isn’t exactly gripping prose. But if you were to be involved in an accident, the policy could read like a Hemmingway novel: *To Whom the Bill Goes*.

After a sling broke and dumped a 20’ boat on his chest, Tom Benton sent the \$60K in medical bills to his wife’s HMO only to learn that its policy’s coverage doesn’t extend to job-related accidents.

For that, he should have had Workmen’s Comp. Therein lies another potential glitch. If you work on a “Navigable Waterway,” in order to be covered you need to get a Longshoreman and Harbor Workers endorsement. Yet another glitch has to do with navigable waterway, which is defined as any waterway used for interstate commerce. New York harbor, the Chesapeake Bay, Puget Sound, etc. are obviously navigable waterways. Any lake or river that is bordered by two states, automatically becomes a navigable waterway. But what about the Neosho River in Oklahoma? Because the Neosho was used in the 1800s by fur traders who were moving goods to other states, it too is considered a navigable waterway.

In Tom’s case, he is now paying \$1,400/year vs. \$900 for Workers Comp without the endorsement. The moral? Read the fine print. Or never get sick or get hurt. □



2006 Planning Calendar Of Educational & Association Events

October 10-13, 2006 **Society of Naval Architects and Marine Engineers (SNAME)** is having their World Maritime Technology Conference in Fort Lauderdale, Florida at the Greater Fort Lauderdale/Broward County Convention Center. The conference will provide a forum for discussion and exchange on issues related to the future of the global maritime industry. For more information, contact Brenda Elmore-Feliciano at (201) 798-4800, ext. 3035 (belmore@sname.org) or visit www.sname.org.

October 18-21, 2006. **The National Marine Electronics Association (NMEA)** 2006 convention will be held in Naples, Florida at Naples Grand Resort & Club. Contact the NMEA National Office at 800-808-6632 for registration information or visit www.nmea.org.

November 1-3, 2006 **The International BoatBuilders' Exhibition & Conference (IBEX)** will be held at the Miami Beach Convention Center in Miami Florida. For more information, contact Judith Neary at (312) 946-6247 or jnearly@nmma.org.

November 6-9, 2006. **American Boat and Yacht Council (ABYC) Marine Corrosion Certification** will be held in Seattle, Washington. The two-day course emphasis includes metal corrosion as it pertains to the design, construction, repair, and maintenance of boats. Corrosion theory and chemistry is discussed in detail. Contact ABYC at (410) 956-1050 or email jbusch@abycinc.org.

November 9-12, 2006. **American Boat and Yacht Council (ABYC) Diesel Certification Course** will be held in

Jacksonville, Florida. Contact ABYC at (410) 956-1050 or email jbusch@abycinc.org.

November 13-16, 2006. **American Boat and Yacht Council (ABYC) Electrical Certification Course** will be held in Nashville, Tennessee. The three-day course will cover basic theory, alternators, generators, inverters, battery chargers, etc. Also, AC & DC circuits will be covered in detail, as well as troubleshooting practices. Contact ABYC at (410) 956-1050 or email jbusch@abycinc.org.

December 5-8, 2006. **American Boat and Yacht Council (ABYC) Marine Systems Certification Course** will be held in Charlevoix, Michigan. Contact ABYC at (410) 956-1050 or email jbusch@abycinc.org.

ISOLATION OR POLARIZATION, from page 10 system, into the water, and back to the secondary (neutral) of the boat's transformer via the faulted boat's grounded underwater metals.

However, if the primary side grounding wire was also connected to the secondary side grounding wire (as required in a Polarization System), then the requirement of paragraph 11.9.1.3 above would be met, and a circuit breaker would likely trip, securing power to the fault and stopping dangerous current flow in the water.

It's important to recognize that any isolation transformer device (as recognized by ABYC, meaning it has a qualifying shield) can be wired as a Polarization System by connecting the shore grounding wire to the transformer case, shield, and secondary. Most installers simply choose not to do it this way since they are out to stop any corrosion that may be associated with a direct connection to the shore grounding system.

But there is a technical solution that enables all objectives to be met simul-

taneously: a galvanic isolator. A properly engineered isolator, one that never compromises the continuity of the safety grounding path (i.e. designated "fail-safe"), may be installed in the grounding circuit to minimize the likelihood of corrosion problems. This will also ensure that the benefits of having an *effective* fault path back to the source are maintained.

Back to the original question: Would you intentionally go around your own home and selectively sever the green grounding connections on receptacles and appliances? Of course not! The same argument applies when the grounding connection is severed on a boat using an Isolation Transformer System!

Although there is much controversy surrounding this topic, primarily because it is not well understood, there are many staunch proponents of using Polarization Systems. One of those is Ward Eshleman of Ward's Marine Electric. Ward only installs transformers as Polarization Systems for all of the customers who have requested transformers. His policy is clearly based on the lessons from which the National Electric Code was developed

over the years.

Ignoring these lessons, as is commonly done today with Isolation Systems, represents a potential safety hazard to those *on the boat as well as anyone in the water around the boat*. This in turn has potential liability implications when there are safer methods for obtaining the benefits of using transformers on boats.

Clearly, the motive for intentionally severing the grounding connection to the shore service is technically misguided and contrary to the safety provisions outlined in the National Electric Code. It's time to re-evaluate this practice and establish conformance to the lessons established in this area by prevailing standards. This will ultimately improve the safety of the equipment we provide to marine industry consumers.

Dave Riskin is an ABYC Electrical and Corrosion Certification instructor. You can contact him at qualitymarinesvcs@comcast.net for any clarification needed or for further discussion. □