The Aids to Navigation Bulletin

National Aids to Navigation School **Summer/Fall 2010**

National Aids to Navigation School
US Coast Guard Training Center, Yorktown, Virginia

ATON systems of the United States and its territories are established, operated, and maintained by the Coast Guard to assist mariners in locating their position and to warn of nearby dangers and obstructions. This is done for the benefit of commercial vessels, recreational boaters, and to support the operations of the Armed Forces. Title 14 of the US Code makes this a responsibility of the Coast Guard.

The Bulletin is published to support the individuals and units involved in providing a reliable ATON system for the mariner. The Bulletin seeks to meet the following objectives:

- To provide a means of circulating job skill information among ATON technicians,
- To increase the professionalism and knowledge of all ATON personnel,
- To act as a channel for information flow amidst the ATON servicing units, Sector Office staffs, District Office staffs, Headquarters staffs, and units, and
- To publish articles and photographs about people, units, or events which may be of general interest to the ATON community.

To satisfy these objectives, it's necessary for all who read the Bulletin to take an active part in determining its contents. If you have found a "better way" or performed a unique evolution, share it with other people in the ATON field. Submissions are welcome in any form. Articles and images may be submitted electronically to the editor via email at tracy.m.speelhoffer@uscg.mil or mailed to:

ATON Bulletin Editor (tnaton)
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1 USCG Training Center
Yorktown, VA 23690

Electronic submissions are preferred. Please keep photographs in original electronic form, and send them as separate files; do not imbed or copy them into word documents.

The articles contained herein are non-directive and non-record material. They are published for informational purposes only.

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Summer 2011 - Phonebook

Volume 37, Number 3

On the Cover: *ELM crewmembers overlook collected oil in the Gulf of Mexico*

photo contributed by ENS Ian Phillips Dezalia, CGC ELM (WLB 204)

IN THIS ISSUE . . .

NATON News.....2

ATON History.....4

News Clips.....6

Technical Corner.....22

Good Times.....28

Crewmembers of USCGC ELM (WLB 204) work on the buoy deck to set up oil collection

Photo by ENS Ian Phillips DeZalia

OPERATIONS SECTION
LTJG Nick Monacelli, 757.856.2350

Aid Positioning (ANC-AP)
November 30 – December 8, 2010
January 18 – 26, 2011
February 8 – 16, 2011
April 5 – 13, 2011
May 17 – 25, 2011
August 16 – 24, 2011
September 13 – 21, 2011

Officer Basic ATON (ANC-OB)
March 7 – 11, 2011
June 6 – 10, 2011
August 29 – September 2, 2011

Officer Advanced ATON (ANC-OA)
March 14 – 18, 2011
April 25 – 29, 2011
June 13 – 17, 2011

BUOY DECK TRAINING TEAM
BOSN4 Skip Sawyer, 757.856.2145

Buoy Deck Supervisor (ANC-BDS)
December 13 – 17, 2010
February 28 – March 4, 2011
May 23 – 27, 2011
July 18 – 22, 2011

Construction Tender (ANC-C)
February 28 – March 4, 2011
August 15 – 19, 2011

MAJOR AIDS SECTION
EMCS Keith Wiehrs, 757.856.2795

Automated Lighthouse Technician (ANC-LT)
January 31 – February 11, 2011
March 14 – 25, 2011
May 2 – 13, 2011
August 1 – 12, 2011

MINOR AIDS SECTION
BMCM Brian Williams, 757.856.2066

ANT OIC (ANC-ANT)
March 21 – 25, 2011
April 18 – 22, 2011
August 8 – 12, 2011

Minor Aids Maintenance (ANC-MAM)
November 29 – December 3, 2010
January 31 – February 4, 2011
February 28 – March 4, 2011
May 9 – 13, 2011
June 13 – 17, 2011
August 15 – 19, 2011

Advanced Minor Aids Maintenance (ANC-AMA)
December 6 – 10, 2010
January 10 – 14, 2011
February 7 – 11, 2011
March 7 – 11, 2011
May 16 – 20, 2011
June 20 – 24, 2011
August 22 – 26, 2011

ATON Tower Climber Safety (ANC-TC)
November 1 – 5, 2010
March 28 – April 1, 2011
April 11 – 15, 2011
September 12 – 16, 2011

River Tender (ANC-RIV)
August 29 – September 2, 2011

Training Team Management (ANC-TT)
July 26 – 28, 2011

NOTE: All course dates are subject to change. Please check TQC's website (http://www.uscg.mil/hq/tqc/default.asp) to confirm course dates before submitting ETR's

New NATON School Chief

by LT Mark Crysler, NATON School

To all within the ATON Community,

I would like to take a minute of your time and introduce myself to you as the new NATON School Chief.

I recently reported aboard from HENRY BLAKE and look forward to working with all of you over the next several years. I have been very fortunate in my career and report aboard with an extensive aids to navigation background. My career experiences have included six buoy tenders ranging from Commanding Officer (2 WLM's), Executive Officer (WLB), 1st LT (WLB & WLM) to Officer In Charge (ANT).

As an operator, I have always held NATON School in the highest regard and it is my goal to continue to provide the field with the outstanding service you are entitled to. In order to provide that service, I ask for feedback, both positive and negative as we are constantly reviewing course curriculums and looking for improvements.

Please do not hesitate to contact myself or any member of this outstanding, dedicated staff here at NATON if we can be of any assistance. My intent during my time here is to travel with our exportable training teams as much as the schedule allows in order to make certain you are receiving the training needed to safely and competently complete your mission.

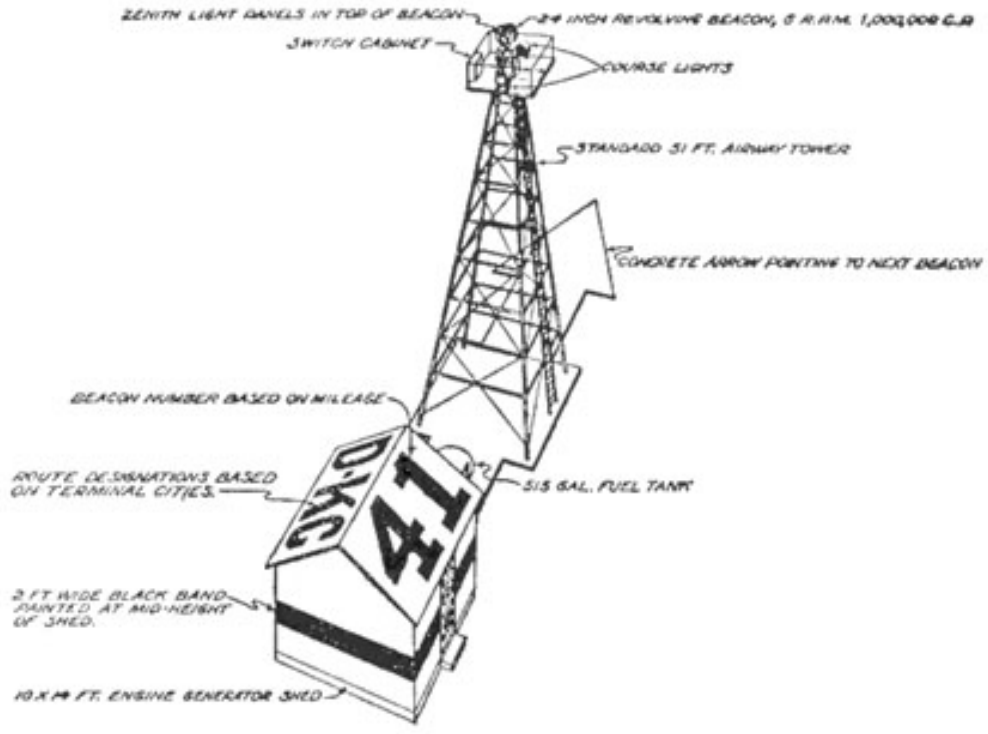
I look forward to working with all of you.

U.S. Lighthouse Service Airways Division

by BM1 Stacy R. Thomas, NATON School

On the 17th of December, 1903, Surfman John T. Daniels of the Kill Devil Hills Life-Saving Station captured what might be the most recognized photo in aviation history: that of Orville and Wilbur Wright's motor-driven, heavier-than-air flight. Aviation boomed, and by 1918, the U.S. Postal Service was using planes to regularly carry the mail. At that time, pilots navigated by following the terrestrial-based highways or railroads. This limited pilots to only flying in the daytime.

In 1923, Congress approved funding for the lighting of a transcontinental air-mail route. This would be a series of beacons spaced approximately 10 miles apart. In this manner, a pilot at night could leapfrog from one beacon to the next. The Air Commerce Act of May 20th, 1926, placed the Secretary of Commerce in charge of administrating this system. The U.S. Lighthouse Service, which was a part of the Department of Commerce at that time, was a natural choice to manage the Airway Beacon System.

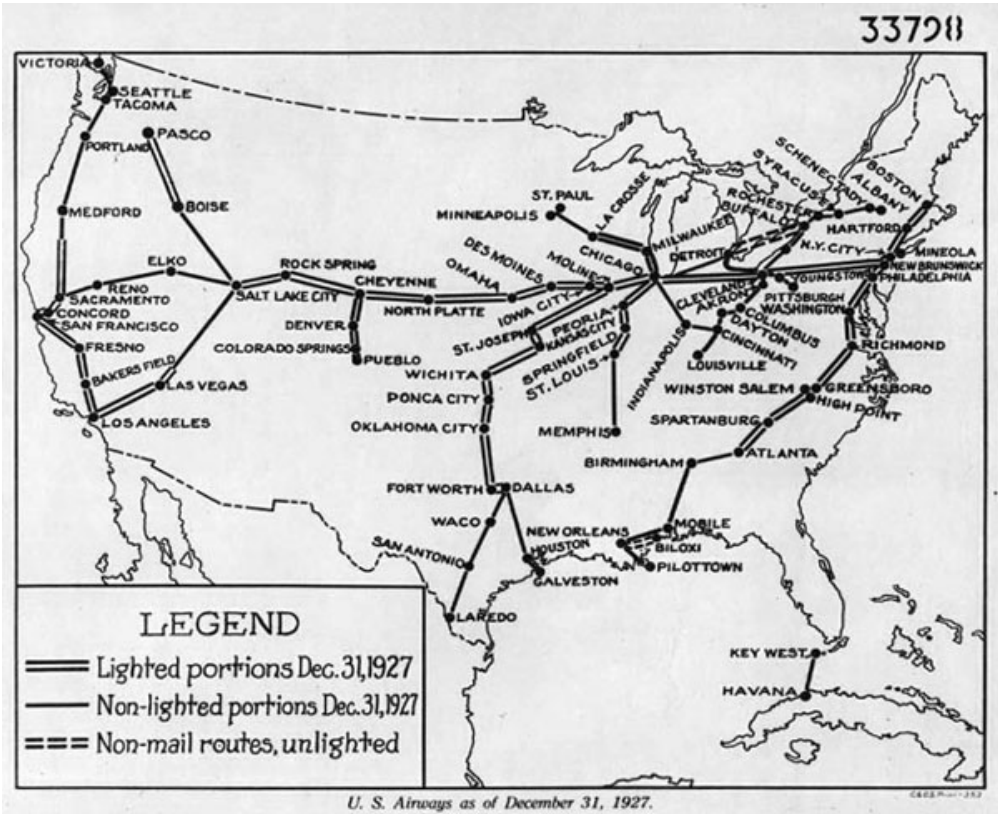


The U.S. Lighthouse Service took control of the system on July 1st, 1927. At that time, there were 1,389 miles of lighted airways in service, consisting of 755 beacons, 616 of which dated from when the U.S. Postal Service managed the system.

The Airway Beacons were standardized as much as was practical. A typical site contained a 51' steel skeleton tower, atop which was mounted a 24" rotating beacon. The beacon produced one flash every 10 seconds. Also mounted on the tower were two course lights that pointed forward and backward along the course route. They were colored red, unless the beacon had an adjoining landing field, in which case it would be colored green.

If required, the site also had a small building for an electrical generator. The tower was painted an alternating yellow and black color. The generator building was painted yellow with a 2' black band painted midway up the walls. On the roof were painted the route's designation code and beacon number. The entire aid was mounted on a yellow-painted concrete pad. To assist aviators during the daytime, the concrete pad was in the shape of an arrow pointed towards the next beacon on the route.

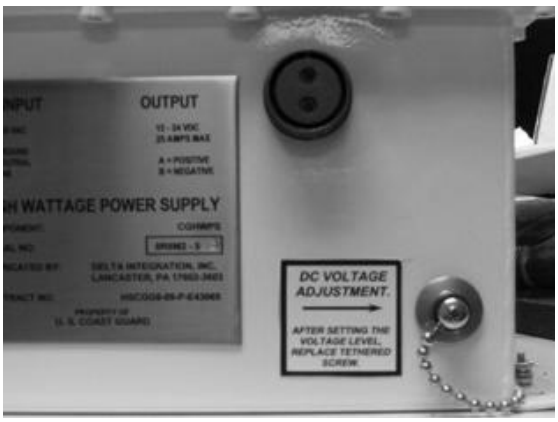
By 1933, there were 18,000 miles of lighted air routes. On July 1st of that year, the Airway Beacons were transferred out of the U.S. Lighthouse Service. Federal responsibility for lighted air routes ended in 1973. Currently, only the State of Montana maintains any lighted air routes, with 19 beacons guiding aviators through the rugged western part of the state.



U. S. Airways as of December 31, 1927.

25 AMP High Wattage Power Supply (HWPS) Safety

by ETC Wesley Richie, NATON School



The modified HWPS with Depot Change installed, providing external access to the variable resistor (R9)

The Major Aids teaching staff recently paid a visit to C3CEN and was given a tour of the ATON facilities. One of the items pointed out was the 25 AMP ATON HWPS and the presence of high voltage inside ***even when the A/C power is secured to the equipment***. Capacitor 1C1 has an excess of 300 VDC which poses a safety threat to anyone that comes in contact with the component. A SMEF advisory was released to advise ATON servicing units of this potential safety hazard. See C3CEN msg R 052126Z AUG 10/ C2CEN SRAN SMEF ADVISORY 10-002 available at following link: http://cgweb.lant.uscg.mil/c2cen/Files/C2CEN_SMEF_ADVISORY_SRAN-10-002.htm

The following HWPS and their contract numbers apply to this SMEF advisory:

A. DTCG23-96-P-TEYE69 CALTRONICS

B. DTCG23-98-P-TEYE23 DELTA INTEGRATION

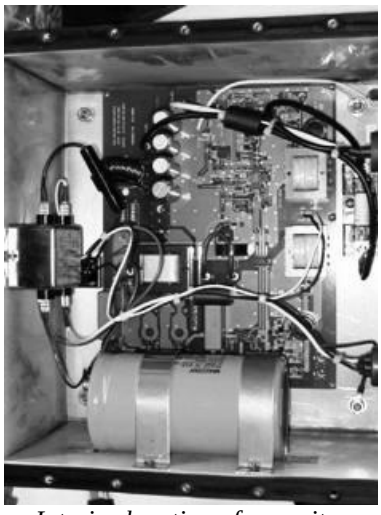
C. DTCG40-00-R-20015 GREYSTAR ELECTRONICS

Adhesive warning labels are available and are required to be applied by the ATON servicing units. Because of the need to complete adjustments of the output voltage resistor (R9), the warning label is in place to remind the field unit of the potential safety hazard. Only qualified personnel should remove the access cover to perform the PMS procedure.

Units are also advised that any replacement of the HWPS should be completed via Mandatory Turn In (MTI) MILSTRIP procedures using Federal Stock Number (FSN) 0C6130-01-464-8379.

Units requiring warning labels, or with any further questions regarding this issue, are advised to contact the following C3CEN POCs:

- Al Davis – e-mail – alan.b.davis@uscg.mil
- Paul Lamczyk – e-mail – paul.j.lamczyk@uscg.mil



Interior location of capacitor 1C1 (bottom, w/ 2 brackets)

Your e-mail should include number of warning labels required and LLNR of aid with ATON HWPS units.

A depot level Field Change has been developed, which provides external access to R9 and eliminates the need to remove the access cover. Once approved, the depot change will be installed on existing RFI HWPS inventory and equipment turned in for repair.

New Lighthouse Technician Class

by EMCS Keith Wiehrs, NATON School

In early 2008, the need for a Job Task Analysis was identified for the Lighthouse Technician course (ANC-LT) by TRACEN Yorktown's Performance Systems Branch, which helps maintain the overall health of our courses throughout their lifecycle. The analysis included input from over 40 members of the ATON community who service and maintain all types of lighthouses in their respective AOR's. Our findings identified new course objectives and highlighted the need to remove or update current course objectives to better align the course with the most current and potential future lighthouse equipment in use today.

With the new course objectives in development, it was found that combining both the ANC-SP (Solar Lighthouse, five days) and ANC-LT (Automated Lighthouse, fifteen days) courses yielded better training for technicians. Some lessons were removed, some course objectives were combined with the existing Automated Lighthouse course, and new training aid objectives were implemented to keep up with the latest changes in technology. The last ANC-SP class graduated in November, 2009 and the new Lighthouse Technician pilot class was held in January of 2010.

Training on the equipment, troubleshooting, and being able to successfully maintain lighthouse systems remain the goals of students upon graduation. Although there is no standard configuration when it comes to lighthouses—some are solar, some use commercial power (AC), and some are a combination—we cover all categories in use today.

The new course, which features new training aids to fit the material, is ten days long and is offered five times per year with a maximum of ten students per class. Prerequisites to attend are that the member is an EM or ET, E-4 or above. On a case by case basis a non-EM/ET member can request a waiver through the NATON School Chief, if the member has been at his/her unit for at least 6 months and has successfully completed ANC-MAM and ANC-AMA. When submitting an ETR, be sure to list alternate dates for enrollment and check TQC's solicitation messages. Also, check TQC's website regularly to ensure class dates haven't changed.

NATON continues to struggle with filling quotas for this class. We need at least 5 students to hold a class. Since 2008, we have had to cancel three classes. This could be due to lack of awareness or lack of interest. For now, we will assume that the EM/ET's out in the field are not aware of this excellent training opportunity. Please help us get the word out!

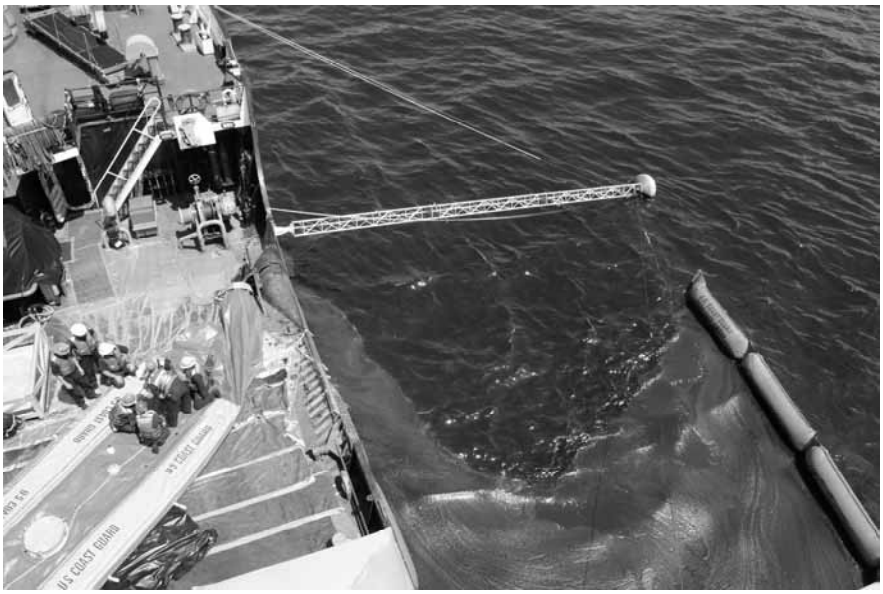
Skimming Oil in the Gulf with SORS

by ENS Ian Phillips DeZalia, USCGC ELM (WLB 204)

Oil recovery operations are among the many missions the Juniper class of Seagoing Buoy Tenders (WLB) was designed to execute. Armed with a Spilled Oil Recovery System (SORS), WLB's are able to respond immediately to emergency oil spills. However, since the first WLB's were launched in the late 1990's this capability has lain mostly dormant, except for training. This was certainly the case for ELM when it was deployed in May 2010 to respond to the Deep Water Horizon (DWH) oil spill in the Gulf of Mexico. Now, ELM deploys its fast sweep boom and weir skimmer several times a week to skim oil slicks found anywhere from floating far offshore near the DWH site to dangerously close to beaches and marches along the Gulf coast. As ELM enters its third month deployed to the Gulf it has successfully skimmed over 500,000 gallons of oil using SORS.

While the designer's conception of SORS differs from how ELM and other WLB's are utilizing it today, the basic principles remain the same. Using its crane and an outrigger arm, WLB's position their fast sweep boom alongside the vessel, creating a u-shaped collection pocket. Approximately 1 to 1.5 knots must be maintained to prevent oil from escaping from the pocket due to excessive speed and to check the boom from advancing out of station due to a lack of forward momentum. Once oil is collected to a thickness of about three quarters of an inch, the weir skimmer is lowered in position to the rear of the pocket. The skimmer is capable of collecting 440 gallons per minute with a discharge of up to 150 psi.

The major change to SORS for the DWH mission has been how the collected oil is stored. The original design called for oil storage in a shipboard compartment. However, due to a variety of mechanical and engineering deficiencies, this method was never implemented. A later modification used a dracone, or sea slug, towed astern. This component was ineffective because the excessive strain put on the vessel and the slug significantly decreased ELM's maneuverability and speed while also endangering the integrity of the slug itself. Oil was also unable to be removed from the slugs.



ELM collecting oil

WLB's in the Gulf have adopted two new storage and offloading techniques: skimming into three highway tanks stored on the buoy deck, and offloading the oil directly into a barge towed alongside the cutter simultaneous to skimming oil. These two methods have dramatically improved oil spill response flexibility and the amount of oil able to be collected in a day. The barge has allowed the recovery of up to 130,000 gallons of oil in a day. However, for dispersed oil slicks of reduced concentrations, skimming into the highway tanks offers more maneuverability and increases WLB response capability.

There are currently eight WLB's using SORS in response to the DWH spill. They are joined by two WLM's equipped with Vessel of Opportunity Skimming Systems (VOSS). With this many buoy tenders deployed away from their AOR's for such an extended period, many other units are filling in the gaps left behind, especially when it comes to ATON responsibilities. Both the WILLIAM TATE and the JAMES RANKIN have worked a significant number of buoys in ELM's AOR, making it possible for ELM to remain in the Gulf for as long as necessary. This is just one example of how the ATON community and the greater Coast Guard have pulled together to respond to this crisis.

The Coast Guard will likely have some WLB's deployed for spilled oil response in the Gulf for the foreseeable future. The DWH spill is unprecedented and tragic. However, it has afforded the Coast Guard the opportunity to test and modify its primary skimming assets: the WLB's. These experiences are invaluable and will enhance the Coast Guard's spilled oil response capabilities in the long-term.

ELM with SORS gear deployed in the Gulf

USCGC JUNIPER Responds to Deepwater Horizon Oil Spill

by ENS Andrew Kauffman, USCGC JUNIPER (WLB 201)

On June 2nd, USCGC JUNIPER began the 1,700 nautical mile transit from Newport, RI to the Gulf of Mexico to assist with oil recovery operations after the explosion on the Mobile Offshore Drilling Unit Deepwater Horizon. Having only used the Spilled Oil Recovery System (SORS) during training evolutions, the trip would prove to be an invaluable learning experience for JUNIPER, and the entire Coast Guard, in oil recovery operations. The Deepwater Horizon spill created many challenges in equipment limitations, crew fatigue, and safe operating conditions.

JUINPER with SORS gear deployed in the Gulf of Mexico

Preparations for JUNIPER's deployment to the Gulf were critical in ensuring initial operating capability upon arrival in theater. Notable pre-deployment preparations included the installation of new carbon filters for the ventilation system, portable air conditioning units for aft berthing areas, and an on demand water pump for the 4-57-0-W ballast tank. Due to the possibility of gasses emitted from the oil, Aerostar Series 550 Odor Removal Pleats were installed in the ventilation system to improve interior air quality. These carbon filters proved to be highly effective at minimizing interior odors and harmful vapors. The portable A/C units aided in cooling the surrounding spaces, including aft steering, where temperatures were recorded in excess of 100 degrees F. The on demand water pump was installed for the 4-57-0-W ballast tank to provide fresh non-potable water for buoy deck cleaning and forward laundry. With water conservation in effect due to having to secure the Reverse Osmosis units, this pump allowed JUNIPER increased endurance while maintaining adequate decontamination procedures.

The major components of the SORS collection system for WLB's include the DESMI-TERMINATOR Skimmer DS-250 pump, Control Stand, 48' outrigger arms, Fast Sweep Boom Assembly, Sea Slug, and all necessary hydraulic hoses and hardware. Each WLB maintains

two sets of gear in the SORS cargo hold, providing capability to skim on both sides of the vessel. Prior to JUNIPER reaching the Gulf of Mexico, Sea Slugs were determined to be unreliable due to high failure and inadequate configuration for at sea lightering once full. As with several elements of the SORS system, the slugs proved great in theory but impractical in execution. As a solution, three 4,200-gallon highway tanks were installed on the buoy deck. These tanks allowed for a combined 12,600 gallon retaining capacity with the option to decant the oily water. While the installation of the tanks provided a solution to the Sea Slug deficiencies, it presented additional challenges by securing access to the SORS cargo hold. As a result, all SORS gear was removed from the cargo hold prior to the tank installation and stored on the foc'sle. This allowed for easy replacement of broken parts while skimming.

The next major obstacles were the poor condition of the SORS fast sweep booms and deficiencies in their design. In most cases, the SORS fast sweeps that came with the cutter's original outfit were over 12 years old and had been packed away in the hot and damp SORS cargo hold. As a result, many of them failed within the first two weeks of use. Initial testing of the standard SORS fast sweep boom resulted in oil escaping out of the bottom of the boom while skimming at slower than design speeds. A sufficient "pocket" was not formed at the rear of the boom for the DESMI-250 to skim from. Additionally, bladder filling valves and the inner air bladders failed at an alarming rate. As a result, JUNIPER was outfitted with two additional booms to test; a foam filled boom and the VOSS sweeps. The foam boom performed well at speeds less than 0.5 kts in calm seas; however, with an increase in speed or seas greater than 2 feet, oil escaped out the back of the boom. The VOSS sweeps performed the best out of all booms tested once the netting was removed. The netting provided many challenges during deployment by twisting the boom and during skimming operations by pulling the boom away from the hull. Once the netting was removed, the VOSS sweeps were capable of retaining oil at speeds of 1.5 kts and in seas up to 3 feet.

Tug TODD DANOS and barge in side tow for lightering of the tanks

Although outfitted with three oil tanks, JUNIPER was still limited in her skimming ability by holding capacity. When skimming large patches of oil, all three tanks could be filled in as little as an hour. In order to maximize skimming operations, the tanks were either lightered to pre-staged barges or a barge was taken in a side tow for direct

pumping. The barges ranged in length from 200 to 300 feet, with a tug assist. Lightering of the tanks was accomplished by making off to the barge and using the DOP 160 hydraulic pump with JUNIPER's port SORS HPU hookup and extra SORS hydraulic control stand. The DOP 160 proved to be the most reliable and quickest method to lighter the heavy oil sludge mix at a rate of 190-200 gpm. Using this method, all three tanks could be pumped down in roughly 3-4 hours, pending any debris in the oil which clogged the pump. The ship's crane was used to lift the pump in and out of the tank, with hoses running to the barge. When the barge was set up in a side tow, JUNIPER was able to lighter tanks while pumping skimmed oil directly to the barge. Pumping directly to the barge in large concentrations of oil was the most effective method of recovery.

CWO3 Molnar, BM2 Scott, SN McCarthy, SN Gallagher, and SA Smith offloading a tank to an awaiting barge with the DOP 160 pump

The ability to have an effective "skimming day" rested heavily on the ability of air assets to vector cutters into skimmable oil as early as possible. SORS set up, break down, and approaching and departing a barge can take an hour or more per evolution, leaving limited daylight for actual skimming. Once oil was found each day, each cutter had to make a determination of whether to skim to the tanks or pump to the barge. Weather conditions, concentration of oil, barge availability, and proximity to other vessels were the major factors in determining which method was appropriate. The trade off between the tanks and barge came down to maneuverability versus capacity. When operating in strong currents, small concentrations of oil, or in close proximity to other vessels, pumping into the tanks was most desirable due to the increased maneuverability. Large concentrations of oil and calm seas were preferred for the side tow configuration. The side tow configuration enabled JUNIPER to collect more oil since there were no capacity restrictions or time constraints.

Taking a barge in side tow caused a number of concerns relating to the 225' side tow capacity. Since taking a barge in a side tow is not a common operation for the 225' fleet, there was a

large learning curve. The biggest concerns when initially taking the barge in tow were the tow strap configuration, tow strap limitations, and bit capacities. With help from tugs and lessons learned from all of the 225's, it was found that keeping the rudder and stern thruster aft of the barge would allow for the greatest maneuverability. Proper fender placement and line arrangement were critical to minimize chafing and possible damage to the barge and cutter, while maximizing maneuverability. The tow strap configuration was set up with lines 1 and 4 with a slight forward lead to assist with turning the barge, line 2 doubled from the forecastle with an aft lead and line 3 doubled from the aircastle with a forward lead. Repeated ahead and astern turns were required to adequately get all the slack out of the towing straps. This line and fender configuration enabled JUNIPER to stay tight against the barge and eliminate unnecessary movement while maneuvering. Since JUNIPER had never conducted a side tow, more substantial tow straps were needed to safely operate. Until appropriate tow straps were procured, standard mooring lines were used as the primary lines with the barges lines used as the double up. Standard double braid nylon line worked but was not an ideal solution. Of particular concern was the lack of a WLB drawing that listed official towing capacities of the bits. After considerable research it was determined that the drawing was never created and guidance for deck fitting pull limits is constrained to the capabilities of the lines originally outfitted on the WLB's.

In addition to managing the operational risks, the Deepwater Horizon oil spill response was also a lesson in crew endurance management. Daily temperatures on deck often reached 100 degrees or more. The Tyvek suits were effective a preventing dermal exposure to the oil, but they accelerated heat stress and fatigue. In addition to constant hydration and plenty of sunscreen, other solutions had to be found to reduce the effects of the heat stress. Perspiration wicking clothing was ordered for personnel to wear under the Tyvek. In addition, water fans were set up under tents on the buoy deck to provide a cool zone. Despite the optimal crewing of the WLBs, a SORS bill crewing rotation was created to limit topside work to about 2 hours per shift. Unfortunately, the oiled deck environment created a constant slip-

CGC JUNIPER preparing to deploy the VOSS Fast Sweep boom

ping environment that could not be abated. Extra precautions on top of the highway tanks, including crew rigged safety lines and non-skid, were installed over several weeks to gradually increase safety during lightering evolutions.

Despite having never conducted operations of this nature before, there were many adaptations and innovations developed with the SORS and VOSS gear to maximize skimming efficiency. With multiple 225's and 175's being deployed to the region, trials and errors by all were shared to develop the most effective means of operation. While there were many lessons learned, there are still issues that need to be addressed. All of the SORS and VOSS vessels have had a significant impact on the Deepwater Horizon oil recovery mission. Unfortunately the learning curve was steep and the equipment as designed out of the box was not operationally practical for a spill of this magnitude. Hopefully the lessons learned from the extensive operational use of the SORS and VOSS systems will be captured and refined when the next generation of oil recovery systems are designed, tested, and fielded for future environmental disasters.

In order to maximize oil recovery, skimming operations often lasted until sunset

ATON Qualification and Competency Urban Legend Killer

by BMC Ken Roberts, NATON School

During our careers, we discover certain urban legends and myths about our service. Some Coasties call them "Wives' Tales." There are many out there and sometimes when we ask the question "why is it done that way?" the answer we get is "because that's the way we've always done it."

One of the common urban legends out there is about the minimum time requirements for a member to receive qualification codes and competencies for ATON. Hopefully this article will help alleviate any confusion in the ATON world.

All qualification codes and competencies are managed via the USCG Competency Management System COMDINST M5300.2 and the Competency Dictionary. For competency types, the Competency Management System states the assigned functional or mission area where the requirement of the competency is concentrated; i.e., Afloat Operations; Aviation; Command, Control, Communications, Computers and Information Technology (C4IT). Competencies may be assigned multiple types. The complete list of competency types can be found in the Competency Dictionary.

The Competency Management System COMDINST M5300.2 and the Competency Dictionary can be found at:
http://www.uscg.mil/ppc/ps/member_competencies/competencies_multiple.htm.
This link also provides valuable information on how to add and manage competency codes in Direct Access. I encourage all personnel to check their competency codes in DA to ensure they are correct.

The Competency Management System also states the complete listing of all qualification requirements (schools, Personnel Qualification Standard [PQS], time, prerequisite competencies, etc.) for competencies, as well as any restrictions on who the competency may be assigned to (military only, civilian, enlisted, Auxiliary, or pay grade). According to the Competency Dictionary, for ATON competency codes other than Coxswain and Crewmember of ATON platforms (which require time as per U.S. Coast Guard Boat Operations and Training (BOAT) Manual), there are no minimum time requirements. But, any CO/OINC can create a unit specific JQR and add time requirements before qualifying/certifying personnel at their commands.

The Competency Dictionary is an online database developed, maintained, and published by the Competency Management System Administrator (CMSA) that contains the complete listing of every approved competency. The dictionary includes the competency code, title, complete description and requirements, type, category, and the sponsoring Program Manager for each competency available in DA.

An Electronic APR

by Ms. Marie Sudik, NAVCEN

APR's – you have to print them out and sign them – and then mail them to your dpw office. Or you can try to "go paperless" and send the forms to dpw via e-mail. ATON units and dpw's can determine the best method for their district/unit. Two methods of generating electronic APR's are described here; either method is endorsed by Headquarters.

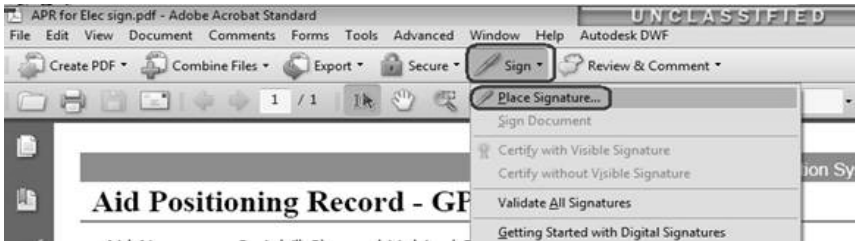
The first method for an electronic APR requires your workstation and a scanner/printer. Create the APR, then print and sign/date with the usual two signatures: Prepared by, and CO/OinC. Once signed, scan the signed document, save the file as an Adobe Acrobat .pdf file, and send the scanned file to your dpw.

The second method uses Adobe Acrobat to sign the APR form electronically. It takes more steps, but there is no paper/printer/scanner involved. The specific steps are described below:

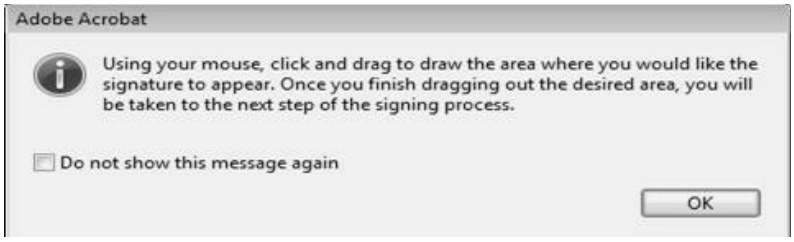
1. Create the APR and save to Adobe Acrobat via printing to a file. Open the document in Adobe Acrobat.

2. Begin the digital signature process – NOTE: do **not** use the CERTIFY process, just use the SIGN process.

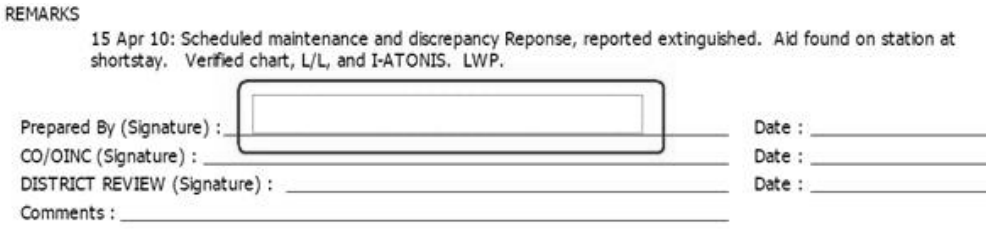
3. To begin the signature process, CLICK SIGN/PLACE SIGNATURE from the toolbar and drop down menu.



4. The following message is displayed

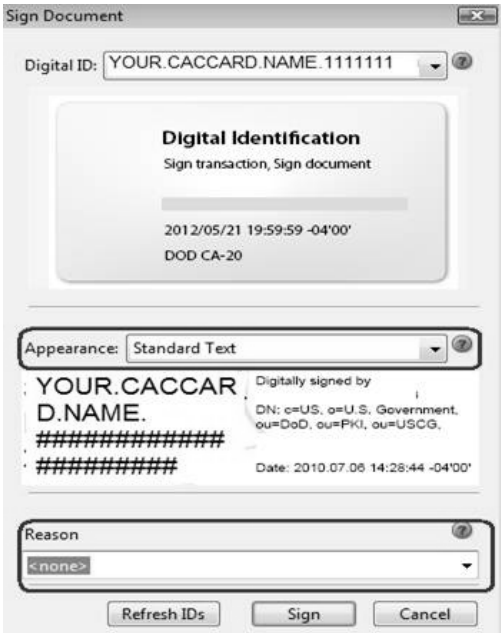


   a. Using your mouse and crosshair on the screen, create a box for the signature:

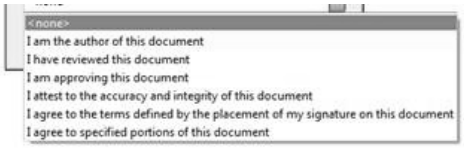


b. The following warning may be displayed – if you want a larger box, this message provides a "START OVER" opportunity:

5. CLICK SIGN and the following Dialog Box displays:



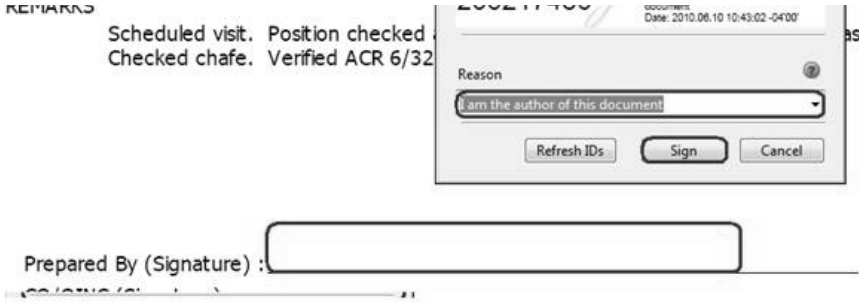
6. CLICK the drop down menu under REASON



Prepared By (Signature) : _____ Date : ___
CO/OINC (Signature) : _____ Date : ___
DISTRICT REVIEW (Signature) : _____ Date : ___
Comments :

If you are the **APR Preparer** (BM), **SELECT** "I am the author of this document".
If you are the **CO/OIC, SELECT** "I am approving this document".
If you are the District, **SELECT** "I have reviewed this document".

In this example, “I am the author of this document” is selected and the signature will be placed on the “Prepared By” line where you drew the box for signature.



7. Once you click SIGN, ADOBE will prompt you to SAVE the document since you have just changed the document by applying your signature:

8. E-MAIL the file as an attachment to your CO/OINC for his/her review/signature. Once both signatures have been applied to the document at the ATON unit, E-MAIL the file to your dpw contacts. The dpw can then electronically sign the document and email back to the unit.

9. Units receiving completed APR’s still must print the form and file in the Aid Folder. Units can also establish a folder on your shared drive for each aid in your AOR. You can add the electronic APR to this file folder. It is also a good idea to print and file APR’s that have been signed by the unit while they are being routed to District. Once you receive the District-signed copy, you can replace the APR that was only signed by the unit. But this ensures you still have a copy of the APR on hand if something happens as the APR makes its way to dpw.

If you need more guidance on saving APR’s as an Adobe Acrobat form, see the tutorial on the I-ATONIS website covering electronic APR’s.

Climbing ATON Structures

by BM1 Stacy Thomas, NATON School

"Old School" climbing...things have changed a bit since then

Tower climbing is not new to the Aids to Navigation community; however is still confusion in regard to tower climbing procedures. In an attempt to dispel some myths, I will outline common questions from the field. The first being that the Coast Guard's Aids to Navigation Manual – Structures (COMDTINST 16500.25A) has been cancelled. This is untrue. Promulgated in 2005, this manual is still in effect and is one of your primary references for tower climbing.

Another common question is at what height is fall protection required? In general, the Coast Guard follows OSHA regulations. Several OSHA publications use a height of 6' as the requirement for fall protection. Some units are quick to point out that our own Structures Manual uses a height of 4', promptly dismissing that as a typographical error. In fact, OSHA has different thresholds for different work, and 6' applies to the construction industry. For general work, a height of 4' is prescribed, and this is what the Coast Guard has adopted.

As members of the Buoy Deck Training Team, one thing we often observe while visiting buoy tenders throughout the Coast Guard is an ATON Technician not securing themselves to the buoy cage with a work positioning lanyard when servicing the light. It's not for lack of trying, as these members are usually outfitted with a proper harness and some sort of shock absorbing lanyard. It's important to remember, however, that if a member falls from a buoy, the member may hit the deck before a shock absorbing lanyard fully deploys. A work positioning lanyard can help prevent this. Options for this include three strand line with a snap hook in each end, or something more efficient, such as Petzl's Grillon, which is adjustable and quite versatile. It is important to note that work positioning lanyards cannot be fabricated by the unit, as they must meet certifications set forth by the American National Standards Institute (ANSI).

Much like you, we here at NATON are eagerly awaiting word on the new Basic and Advanced Tower Climbing PQS. The latest word on the street is that CG-432 and CG-531 are working towards completion and final approval. We understand and have expressed your concerns up the chain and we hope to have approval soon.

The National Aids to Navigation School continues to host four Tower Climber Safety courses throughout the year. CEU also offers tower training including a Train the Trainer course. Both NATON School and CEU can qualify a member to climb. For someone to be "certified" to climb, the individual must be a responsible volunteer, physically capable, completed a PQS, be recommended as "qualified" by a certified trainer , and have final written certification by the unit OinC or CO to climb ATON structures. Remember, safety is paramount and always inspect your gear before you climb.

Vibration Hammer Makes its Debut on the Western Rivers

by BM1 Robert Owens, USCGC WYACONDA (WLR 75403)

Working with the new vibration hammer

Most of the members of the ATON community are aware that two of the Coast Guard's River Tenders that service our country's aids to navigation throughout the Western Rivers can also double as Coast Guard Construction Tenders, with a few modifications. For years, these boats have been driving piles into the Western Rivers using various piston-driven hammers. These hammers that have been used are, to say the least, very dangerous to use as they near the Appleton Crane's SWL.

The USCGC WYACONDA (WLR-75403), homeported out of Dubuque, Iowa, was the first River Tender to perform pile driving missions using a vibration hammer, a piece of equipment that has been used by the commercial industries for decades. The WYACONDA was underway last July with 11 steel piles and a James King & Co. V 5 E vibration hammer. The crew of the WYACONDA was itching with anticipation and hoping that this piece of equipment could drive piles as it advertised and hoped it would outperform their existing Del Mag hammer.

The first test came in mid-July. The WYACONDA pushed into the river bank just below McGregor, Iowa and her crew was set to go. The pile was set into the pile jig with ease as usual. As the crane swung around to pick up the vibration hammer, you could feel the excitement on deck from the crew and the nervousness that something weighing only 6,500 lbs wouldn't be able to drive a pile into the Mississippi River.

The hammer slid onto the pile with ease and was rested atop the pile. When the

A close-up of the hammer

Another shot of the hammer at work

BDS gave the signal for the hammer operator to close the jaws onto the pile, the hammer stood at attention like a young recruit. Finally, the BDS gave the command to slack the crane wire and engage the vibration of the hammer. The end result was having a 50 foot steel pile driven 38 feet into the bottom of the Mississippi River in less than 45 seconds; a sight to behold for sure. The cheers and astonishment exploded from the buoy deck and the bridge alike. But was this a true test? After all, the pile was driven into a sandy bottom.

The third pile that we had to drive was into a rocky bottom. All of the literature on the vibration hammer indicated that it could drive piles into any bottom that the Del Mag could. We were about to find out. The performance of the vibration hammer did not drive the pile as far down as we had wanted it to (only about 12 feet). This might sound bad but on a previous pile trip with the Del Mag, it would only drive about 10 feet into a rocky bottom.

Captain Steven Hudson, Commander of Sector Upper Mississippi River, visited the WYACONDA in La Crosse, Wisconsin to see the operation first hand. The pile Captain Hudson witnessed was driven off of the bow of WYACONDA's barge; something that could never be considered with the Del Mag impact hammer. By adding a pile collar to the front of the barge, that operation went just as smooth as driving a pile off of the side.

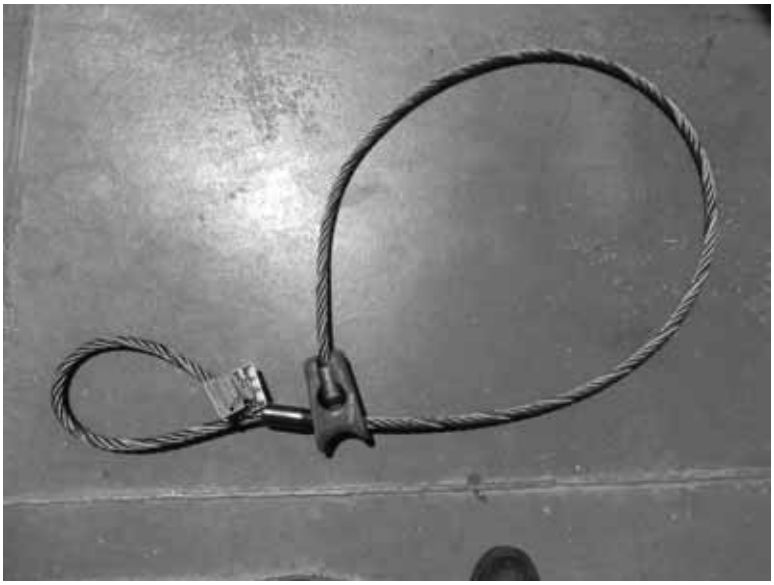
WYACONDA drove a total of 10 piles in 10 days. Some days she drove 2. By the end of the trip her crew was able to safely drive a pile, install a header kit, ladder, dayboards, and a 155mm lantern in a record 1 hour and 25 minutes. That is the same amount of time it would take just to get the Del Mag hooked to the pile and pile jig.

The only thing to complain about with a vibration hammer is the weight and lack of flexibility of the hoses that run from the hammer down to the controls and engine. However, with so few people needed to operate the hammer, you have plenty of bodies to help maneuver the hoses.

My hope is that when the Heartland Security Cutter is designed and established, this technology gets incorporated and all other units have the ability to drive piles. It is a lot safer for our shipmates to work around and it cuts the time by nearly three quarters.

Using the Bardon Hook Sling on Construction Tenders

by BM2 Eric Wieczorek, USCGC VISE (WLIC 75305)



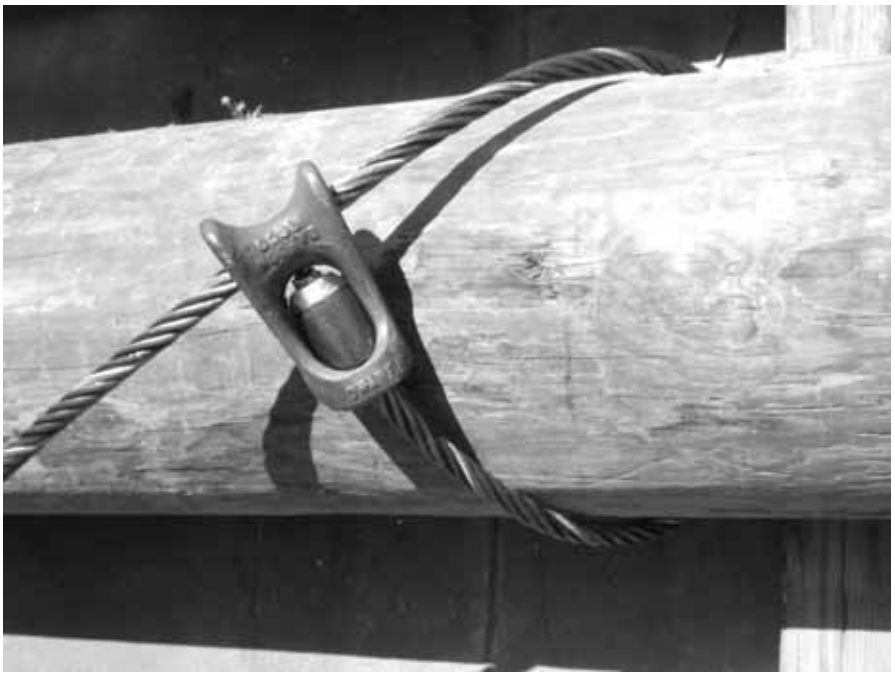
The rig as a whole

We in the construction tender fleet have many parallels with the logging industry due to the nature of our work (wood piles, plenty of wood materials for structures and piers, etc.). Given the similarities among us, we use many of the same tools in the field. Common logging tools found on deck could be forstner drill bits, peavey poles, chain saws and the like. One item that may not be as common is the Bardon hook logging sling. This tool can really increase safety and ease of operations on the construction deck.

The first Bardon Hook came about in the early 1900's. Charles F. Swigert formed a steel foundry in Portland that revolutionized metal working. His new electric furnace allowed for the creation of new, stronger alloys for use in railroads, logging, and bridge building. His new furnace also allowed for easier mass production of metal products. The new alloys were used in the manufacturing of a special hook and socket sling for use in hauling logs out of a cut stand. By the 1920's the sling became an industry standard, and is still in use today in all types of logging (http://www.escocorp.com/about/history.html).

The back side of the Bardon Hook

The Bardon hook sling can be useful on the construction deck for several reasons. It holds the pile positively (the socket locks in to the hook), and holds everything tight against itself. The sling is a choker style rig, and



The proper way to rig the sling to a pile

this wears on the choked area of the wire. Proper rigging is very important, as the weight of the load held flat against itself ensures the rig holds securely. Once the pile is raised out of the rack on deck, and put into the bonnet, the CDS can maneuver as required and safely control the pile. They can raise, lower, or re-spot the pile as needed. Once the pile is on the bottom and the hammer is lowered down, the sling can be lowered and removed as the choke will release itself once the weight is removed.

The Bardon Hook is a safe, reliable, and cost effective tool for the WLIC deck. The sling can be assembled at your local rig shop for $80-$100 a piece, and the Bardon can be recycled and recertified when the wire wears out.

NOTE: Ensure the socket goes into the back of the Bardon and lays flat on the pile; otherwise the hook will not work properly.

Logging Sling Specifications:
Total length: 8 ft (eye to socket) (I recommend 6x37, 5/8" RRL, XXIP, Preformed, IWRC); WLL is approx 7.8 tons; Fittings Required: 8-9 foot long wire of selected size, 1 swage eye (12" opening), 1 bardon hook for appropriate wire size, 1 swage socket or plug to fit Bardon Hook.

A Word on Rotation Detection and the VRB-25 Rotating Beacon

by Mr. Kam Agi, CG-432 (Ocean Engineering Division)

Recently I've had the opportunity to re-examine the way we hook up the rotation detection wiring for monitoring the rotation of a VRB-25 Rotating Beacon. My findings have resulted in a few minor recommended changes to the standard system configurations that will improve the reliability of VRB-25 rotation detecting and monitoring.

Depending on your system type, the hardware that does the actual monitoring of rotation and decision making, or the “brains” of the system, is either the Solar Aid Controller (SACII or SACIII) or the NAVAID Sensor Card (via the Audio Visual Controller) based on channel activity provided by VRB-25's rotation detector. The channel activity signal this hardware looks for is a periodic zero-volt signal, or “ground” pulse as close to zero-volts as possible, in order to hold off internal timers from timing out and posting a rotation failure. What provides this channel activity signal to the hardware is an integrated rotation detector inside the VRB's CALC-20 controller, which is comprised of a solid-state relay optocoupler. Since there is a resistance associated with the output side of this opto relay, a closer look at this and all the other components in the "rotation detection loop" in each system has resulted in the recommendation to minimize the total resistance of the loop for highest reliability operation and best rotation detection performance. The loop is the circuit path starting at system negative (0-volts), running up to the rotation detector, and then back to the monitoring input. If you'll recall, magnetic reed-relay rotation detectors we used in previous-generation rotating beacons had dry-contact closures with essentially no associated losses or resistances to account for. With the VRB-25, things are a little different (for the reasons stated above). As such, I will discuss each configuration separately as there are a few differences between the SAC-based and NAVAID sensor-based rotation monitoring circuits. These changes will be reflected in future revisions to the standard drawings and servicing guides.

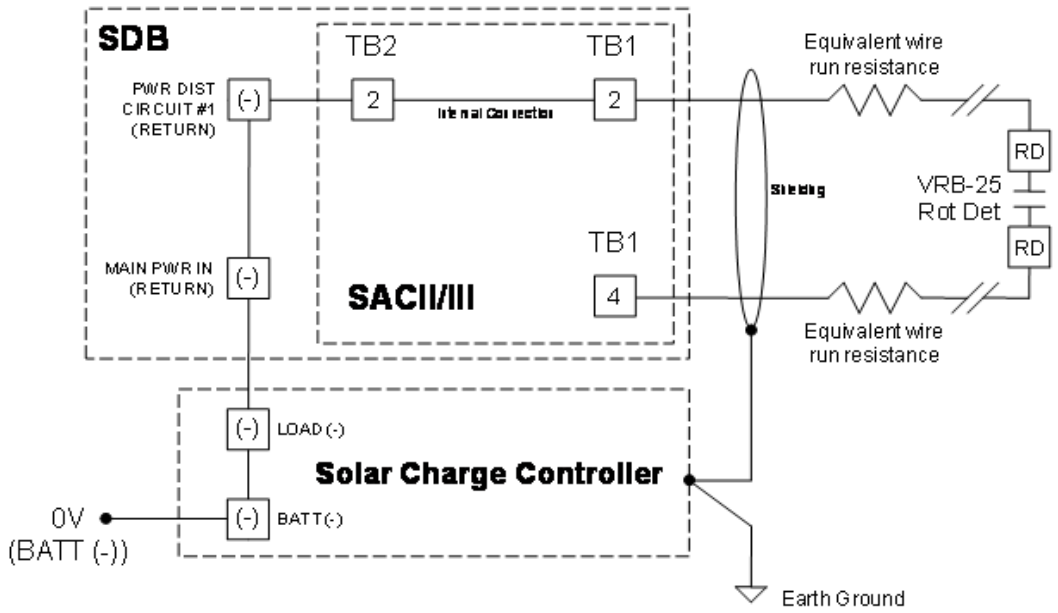
VRB-25/SDB/SACII (or SACIII) Configuration. Referring to standard drawing 140410, the main issue with the present design is that the negative leg of the rotation detection loop taps off the motor (-) inside the VRB’s housing. The problem with this is that as soon as the motor turns on and starts drawing current, the voltage at the motor (-) terminal is no longer zero-volts due to the associated voltage drop across the power feeder line; and, long wire runs between the SDB and VRB only exacerbate this problem. Remember though, the rotation detector signal, or channel activity, that the SAC is looking for are “ground” pulses, or as close to zero-volt pulses as possible. If the signal drifts too far north from zero-volts, the information may not register properly within the SAC and eventually a false rotation failure alarm will occur. Additionally, since the negative (-) power feeder to the motor is not shielded (which, by the way, is also one-half of the rotation detection loop in the present configuration), there could be electro-magnetic interference issues associated with that. Here is the recommended change for this configuration:

a. Inside the VRB housing, disconnect and discard the jumper wire that bridges one side of the Rotation Detector terminal to the Motor (-) terminal.

b. Disconnect and replace the existing shielded one-conductor rotation detector cable with a shielded two-conductor cable (three conductors total) but do not connect the shielding itself to any terminal inside the VRB. The rotation detector input from the VRB-25 should now come in to the SACIII (or SACII) on this new shielded two-conductor cable. The two shielded wires should be the only wires connected to the Rotation Detector terminals inside the VRB housing with the other ends connected to the SACIII (or SACII) at TB1-2 and TB1-4. Please DO NOT use the shielding here as the "ground" side in the rotation detector circuit loop, but instead tie the shielding to earth ground at the SCC's (Solar Charge Controller) ground stud/terminal only (or at another more convenient connection to earth ground); and, to avoid problematic ground loops, the cable shield at the other end should be left disconnected (i.e., trim back but DO NOT connect the shielding to anything inside the VRB housing).

c. After this change has been implemented you should have only the two shielded wires connected to the Rotation Detector terminals (RD) up inside the VRB housing, and nothing else, as depicted in the diagram below. Ensure that the jumper wire that had previously bridged one side of the Rotation Detector terminal to the Motor (-) terminal inside the VRB housing has been removed and discarded and that the shielding of the new two-conductor shielded cable is tied to earth ground down below at the SCC only and nowhere else.

Rotation Detection Loop
VRB-25 / SDB / SACII/III Configuration



VRB-25/AVC/NAVAID Configuration. This one is a little more complicated. As in the SAC configuration, the rotation detector input from the VRB should come into the AVC at 2TB2-15 and 2TB2-16 on a two-conductor shielded cable; but in this case the two shielded wires must remain isolated from BOTH earth and system ground. You must not use the shielding here as the "ground" side in the rotation detector circuit loop either - the two wires MUST be and remain isolated from all grounds. The shielding itself, however, should be tied to earth ground at a convenient point to the AVC chassis only. Conductor size of the two shielded wires is not too critical though since it adds only a few ohms to the circuit (for example, a #20AWG wire adds only about 1-ohm per 100 feet). However, if total roundtrip resistance in the "rotation detection loop" approaches approximately 500 ohms or more, then yes, it will cause real problems with the NAVAID sensor circuit. Although currents are small in the rotation detection circuit, as determined only by the impedance and circuitry of the Channel 1 terminal (CH1) in the NAVAID sensor card (pin 11 on NAVAID card, AVC terminal 2TB8-9), which is a one-shot multivibrator comprised of a NE555 timer chip (it's a trigger for a more-involved circuit down the line in the NAVAID's operation) and a 1,000-ohm pull-up resistor onboard the NAVAID card, the critical point here is that unfortunately the pull-up resistor is fairly small at only 1,000-ohms. This means that unless the rotation detection signal is very close to zero-volts, the input voltage at CH1 may be biased a little too high to properly trigger the one-shot. Not helping the situation is that the 0-volt level picked up within the AVC at AVC's 2TB2-15 terminal, sent up to the rotation detector in the VRB, and then transmitted back to 2TB2-16 and on to the NAVAID's CH1 is not really 0-volts – it is the signal picked up on the other side of the 1CD1 current detector's switch “contacts” from 0-volts (but only while the light is on - that is, only while there is sufficient lamp current flowing through 1CD1) (please see below for possible 1CD1 replacement info). The trouble here is that these switch “contacts” have a voltage drop and a resistance associated with them as well. Additionally, since the rotation detector in the VRB is a solid state relay optocoupler, as was discussed earlier, there's a bit of an insertion loss (typically 30-ohms) in the line that adds to the overall resistance in the rotation detection loop. Now, if all the resistances in this loop add up to a considerable value (approximately 500 ohms), including the voltage drop across the switch “contacts” of current detector 1CD1, we're setting up a voltage divider in conjunction with the 1,000-ohm pull-up resistor on-board the NAVAID at the trigger input to the NE555 chip that may result in a net voltage not low enough during every "0-volt" channel activity “ground” pulse to trigger the one-shot. The NE555 one-shot triggers only when the voltage at the CH1 input drops below 1/3 the supply voltage (Vcc). In this case, the Vcc is 5.0 VDC; so the voltage at CH1 input must go below 1.67 VDC in order for the one-shot circuit to trigger and reset the timer. The duration of VRB’s rotation detection pulses is very short. As a result, the voltage at CH1 input during each rotation detection pulse may be difficult to measure with a standard digital multimeter (DMM) due to limitations of the DMM’s response time. As an alternative, a digital storage oscilloscope may be used if necessary to accurately measure and confirm that this signal pulse registers below 1.67 VDC at CH1 input each time. The recommendations for this configuration are:

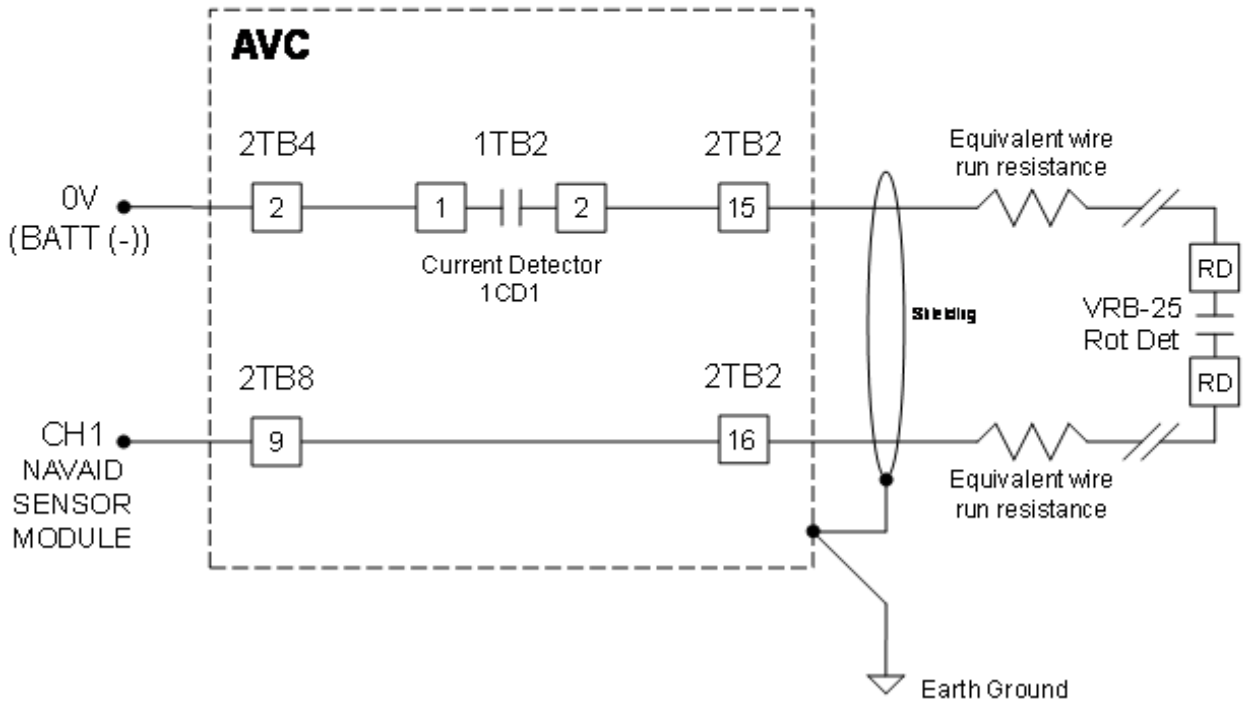
a. As depicted in the diagram below, ensure that the rotation detector line is a shielded two-conductor cable (i.e., three conductors total), ensure that the shielding is tied to earth

ground at a convenient point in the AVC chassis, and ensure that the shielding is never used as a "signal ground" line for channel activity purposes; and, to avoid problematic ground loops, the cable shield at the other end should be left disconnected (i.e., trim back but DO NOT connect the shielding to anything inside the VRB housing).

b. Ensure timing switch S1 for CH1 is set to the proper position for each specific light as determined by its "flash" characteristic (or its rhythm). Please remember that the VRB provides two rotation detection pulses per rotation. For instance, a FL5 signal in a VRB-25 gives one pulse every 15 seconds (2 RPM); a FL15 signal in a VRB-25 gives one pulse every 45 seconds (2/3 RPM).

c. Contact C2CEN's SRAN Product Line group for info on obtaining a new current detector (1CD1) w/on-board indicator LED for installation (replacement) in the AVC. The existing current detector (NK Technologies' p/n D150-2/2A and all other previously used NK models) is no longer manufactured. The LED provides a visual cue for the technician, allowing a quick and accurate current threshold adjustment using the top-mounted trim pot. Proper current detector setup is critical because if the detector's switch does not close while the light is commanded on, the rotation detector channel activity signals will be blocked from reaching the NAVAID sensor and an erroneous rotation failure alarm will ensue.

Rotation Detection Loop
VRB-25 / AVC / NAVAID Configuration



Positioning Word Search!

by BMC R.C. Patten, NATON School

A C U Y S O S S D S V L K H V L N W A V S Q T Z E
S C N A A H E X S M X F N Z C A O H J E Y O O F Q
A B C J N T R F Q W M R A L N J I G B R S E J E W
G R V U F O S M L J N C F K R Y T S U I L K P W R
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