

## **Appendix B – Health and Safety Plan**



# Health and Safety Plan for Dominion Met Facility Deployment

Created by Gary Bradford of Cape Henry Launch Services

## Work Activities

### **Deployment**

- Offload truck containing WindSentinel buoy to land storage site
- Assemble WindSentinel buoy structure to operations status on land (diesel generator off)
- Stage all mooring components
- After land test complete, assembly of first section of mooring to WindSentinel buoy and transport to water, and place overboard (diesel generator can now be activated)
- Complete assembly of mooring on barge and connect WindSentinel buoy to system
- Vessel operators and crew will review the marine trash and debris awareness Gulf of Mexico Notice to Lessees No. 2012-G01
- Transit to offshore location and deploy mooring system and WindSentinel buoy
- Return to base and stow all gear

### **Operations and Maintenance**

- Transit to offshore location and perform visual inspection and preventative maintenance on the WindSentinel,
- Transit to offshore location and disconnect the WindSentinel Buoy platform (leaving the mooring system in place) and tow to shore for full service, return to mooring system when service complete
- Return to base and stow all gear

### **Decommissioning**

- Transit to offshore location and recover WindSentinel buoy mooring and tow the WindSentinel buoy and mooring back to port
- Transit to offshore location and survey to confirm obstructions have been removed
- Return to base and stow all gear

## Involved Organizations

- Cape Henry Launch operators and technicians
- AXYS technicians

## Duties

- Cape Henry Launch Services (CHLS) to perform all duties involved in offloading, assembling the mooring, assisting AXYS technicians to assemble the structural WindSentinel buoy components, placing of all components overboard, the transportation with deployment of the buoy/mooring system, transportation for operations and maintenance activities, and transportation for the decommissioning of the WindSentinel Buoy and mooring
- AXYS technicians to perform the technical aspects of the WindSentinel buoy commissioning, as well as maintenance of the WindSentinel buoy

## Authority Path

AXYS technicians to direct CHLS Staff in the procedures of assembling the WindSentinel buoy structural components as well as any other duties CHLS is required under their direction. CHLS to be responsible for the offloading, moving of the large WindSentinel buoy components, mooring fabrication, as well as deployments. Both parties have the authority to stop all activities for a safety concern.

**Work Locations**

**Barge Site** – Cape Henry Launch Services, Inc.  
 2377 Ferry Road  
 Virginia Beach, Virginia 23451.  
 Contact – Gary Bradford = (757) 377-3535 [gary@capehenrylaunch.com](mailto:gary@capehenrylaunch.com)

**Deployment Sites** –

Platform Identification	Latitude (decimal degrees)	Longitude (decimal degrees)	Mean Lower Low Water Depth (m)
WindSentinel Buoy	36.882938	-75.475578	25.5

**Alternate In-water storage site** –

Cutty Sark Marina  
 4707 Pretty Lake Avenue  
 Norfolk, Virginia 23518  
 (757) 362-2942

**Emergency Response**

- First Aid kit is located in the welding equipment building
- Virginia Dial 911 for emergency service (fire, medical & law enforcement)
- On the water VHF 16 for contact to the USCG for all emergencies on the water
- The closest urgent care center to Cape Henry is:
  - I&O Medical Center**  
 1290 Diamond Springs Rd.  
 Virginia Beach, VA 23455  
 (757) 460-0700  
[www.iandomedical.com](http://www.iandomedical.com)
- The nearest hospital is:
  - Sentara Virginia Beach General Hospital**  
 1060 Colonial Rd.  
 Virginia Beach, VA 23454  
 (757) 395-8000 (Emergency Department = (757) 395-8890)

**Authorized Workers**

- Any staff working on the CHLS barge site, Wharf site or on CHLS vessels to read and acknowledge receipt of Health and Safety plan
- This includes CHLS staff working on Met Facility equipment

**Noted Risk Sources**

1) Crane Operations/Rigging, 2) Manual Lifting, 3) Vehicle/Equipment Operations, 4) Waterfront Operations, 5) Confined Spaces, 6) Welding/Cutting, 7) Electrical Hazards, 8) Lasers, 9) High Noise, 10) Pressure Systems, and 11) Outdoor Exposure

### **Risk Analysis**

#### **Risk Source**

#### **Risk Controls**

##### 1. Crane/Rigging

- All Crane operations, blocking and rigging to be performed by CHLS designated staff
- Pre-lift discussion/planning by stakeholders on all lifts over 5,000 pounds (lbs)
- Required Personal Protection Equipment (PPEs) – hardhat, work boots, long pants, eye protection, and gloves
- Personal Flotation Device (PFD) – must be worn when working near the water
- Load cell – used on all initial lifts or lifts presumed over 5,000 lbs

##### 2. Manual Lifting – Single person lifts limited to 50 lbs. Multiple persons to assist above 50 lbs.

The following recommendations should be considered when lifting or preparing to lift a heavy load:

- Split heavy loads into smaller loads, and reduce the size of individual loads
- Bring the load close to the body
- Remove any horizontal barriers
- Avoid lifts near the floor or ground surface
- If loads near the floor or ground surface cannot be avoided, the load should fit easily between the legs
- Raise/lower the origin/destination of the lift
- Reduce trunk rotation by rotating the feet
- Reduce the lifting frequency and duration
- Provide longer recovery periods
- Use mechanical lifting aids whenever possible

##### 3. Vehicle Operations

- The barge site and waterfront wharf are busy with barge construction, container port operations and container repair operations
- Buoy work activities to be confined to the designated areas
- Care to be taken before transiting other work areas
- High visibility vest to be worn when working outside of CHLS designated work area
- Permission to access and use the wharf area must be obtained from the transatlantic site manager. Gary Bradford must obtain this permission, and brief all workers using the area, of other site activities and known hazards. Vehicles are not to be left unattended in the wharf area.

##### 4. Waterborne activities

- PFD to be worn when working on or at water's edge.
- PPEs – work boots, long pants, to be worn at all times. Hardhats to be worn during lifting and rigging operations. Gloves when handling materials.
- Float Plan must be created and filed with stakeholders prior to voyage.

- A safety orientation to non-CHLS crew/passengers to be held prior to a voyage. Topics to include, location of life vests, first aid kits, location and use of lifesaving devices, man overboard procedures, fire emergencies, and flooding procedures.
- Be prepared for offshore conditions (take seasickness medication BEFORE leaving shore, if it may be needed).
- Stay alert to weather bulletins and changing environmental conditions.
- Satellite phone to be carried onboard for the voyage to the deployment site.
- Vessels to be equipped with e-pirbs and survival apparatuses.

#### 5. Confined Spaces

- The Lidar buoys have four hatches on top that contain instrumentation (Hatch 1), 40 Sunlyte 12-5000x sealed, rechargeable lead acid batteries (Hatch 2), diesel fuel tanks (Hatch 3), and an onboard generator (Hatch 4). The staff working in these spaces to have training on confined space access prior to accessing and working in these spaces.
- Special note: batteries in confined spaces can be hazardous under certain circumstances (e.g., <http://maritimeaccident.org/2013/02/beware-the-buoy-bomb-bird-droppings/>). Staff will read the accident report (URL above) as a lessons-learned.

#### 6. Welding/Cutting

- Anticipated welding/cutting to be limited to the fabrication of the mooring assembly by CHLS staff.
- These operations to be performed at the barge build site by CHLS crew where daily welding operations are performed away from LIDAR buoy, AXYS staff would perform any welding if needed for the WindSentinel buoy.

#### 7. Electrical Hazards

- Hatch 2 on the buoys contains 40 Sunlyte 12-5000x sealed, rechargeable lead acid batteries. AXYS does use a solid-state battery charger / regulator to optimize power and prevent over-charging. The entire battery/charging system is limited to 24 volts DC. This area to be accessed by AXYS staff. Any CHLS staff to work in this area to be briefed by AXYS staff prior to entry.
- Barge site contains one overhead 460Volt 3 phase powerline. Precautions in this area to include a 10' minimum safety zone from this power source.
- Power cords used at this site to be in good condition, avoid standing water, avoid pinch point and connected to GFI receptacles.

#### 8. Lasers

- The Vindicator LiDAR is a Class 1M laser product. It is labeled, "Avoid Exposure. Invisible laser radiation is emitted from apertures. Do not view directly with optical instruments (binoculars or telescopes)."
- The lasers are installed above eye-height on the buoy and point skyward. Staff will not look directly into the apertures while the unit is powered on.

#### 9. Noise

- It is possible that the generator, while operational, as well as other machinery and equipment could be above thresholds for working without ear protection, hearing protection will be available to those working on the buoy.
- Hearing protection is stored in the welding shack next to First Aid Kit.

#### 10. Pressure Systems

- Two empty SCUBA tanks will be shipped to Virginia. These will be taken to a local dive shop where a visual inspection of the interior will be performed prior to filling them with air. The tanks will be installed on the WindSentinel buoy. They will be secured in the vehicle during transport to/from the dive shop. They are Aluminum 80 cu ft tanks rated for 3000 psi (standard off-the-shelf SCUBA tanks with DIN valves).

#### 11. Outdoor Exposure

- The WindSentinel buoy will be on land for assembly, and will be outside where staff working on them will be exposed to outside air temperatures and possibly rain and wind (though a tent or carport-like shelter may be utilized). Staff may be on an open deck at sea depending on the vessel utilized. Staff will dress appropriately for the weather (e.g., layers, warm hats, gloves, rain gear, etc.) and will be able to find shelter in one of the Cape Henry buildings or in a vehicle if necessary to warm up or dry off. It is also possible it could be warm outside. Again, staff will dress appropriately and will carry food and water to the site to stay fed and hydrated.