



Nortek AWAC Waves Sensor at Ambrose Light

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Waves at Ambrose Light



- Ambrose Light (ALSN6) is a highly visible C-MAN station located outside the entrance to New York Harbor.
- Laser wave sensor performance has been unsatisfactory.
- Advancements in technology offer to improve wave measurement at this and other locations.
- Sensors from five leading vendors were evaluated. The 1 MHz Nortek AWAC is best.
- Beside wave height, AWAC returns the wave spectrum and the Fourier coefficients of the directional wave spectrum
- Additionally, the AWAC produces a current profile.



Requirements and Considerations



- Acquire directional wave spectra and send this data to the payload
- Data message will comply with transmission limitations
- The system will process and format the collected data.
- Software modifications will be modular as possible to minimize future modifications that would be needed to support different wave sensors.
- The design will be straight-forward to adapt and install at other NDBC C-MAN stations



Sensor Selection



- The sensor selected is the Nortek 1 MHz AWAC.
- Using an optional transducer head, the sensor can be mounted on a leg of the tower

- The Nortek NIP will be used to process the wave data and will reside inside the AWAC
- The AWAC with NIP is an acoustic Doppler sensor that will collect directional wave and a current profile data





Sensor Selection



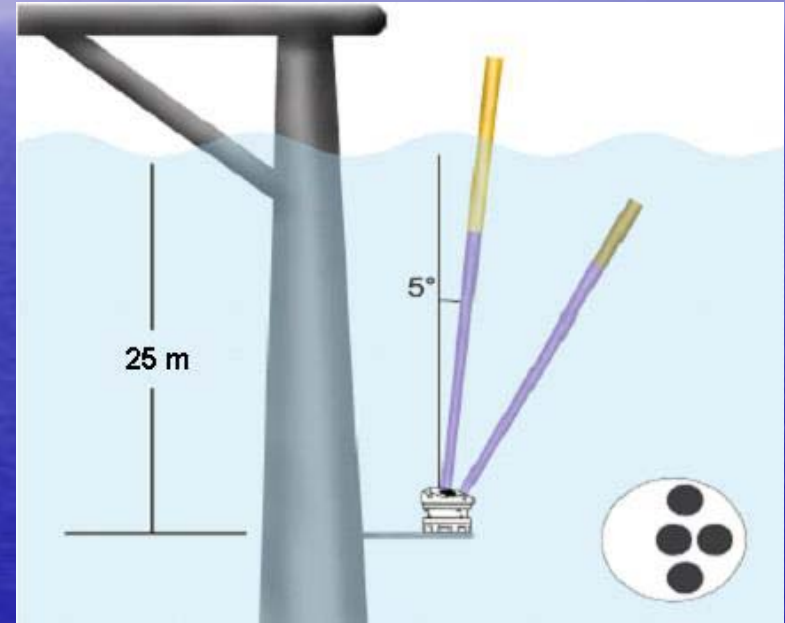
- Primary data include $C11(0.01 < f < .5 \text{ Hz})$, $a1(.01 < f < .29 \text{ Hz})$, $a2(f)$, $b1(f)$ and $b2(f)$, and $u(0 < z < 25 \text{ m} + \eta)$ and $v(z)$
- $f_n = 2 \text{ Hz}$
- 22 m Deployment
- Serial RS-232 output with custom six bit ASCII format



System Overview



- Mounted to South East Leg of tower.
- AWAC-NIP collects current profile and directional wave data hourly.
- Data logger builds payload message and transmits it through HDR GOES
- Gateway processes message and distributes data worldwide





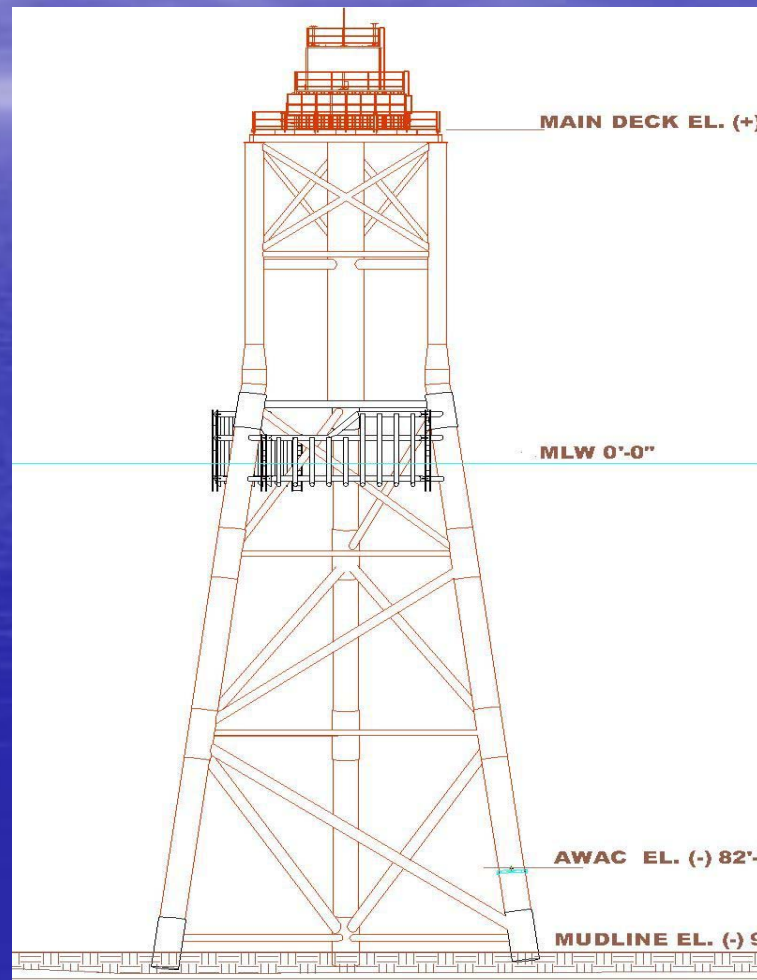
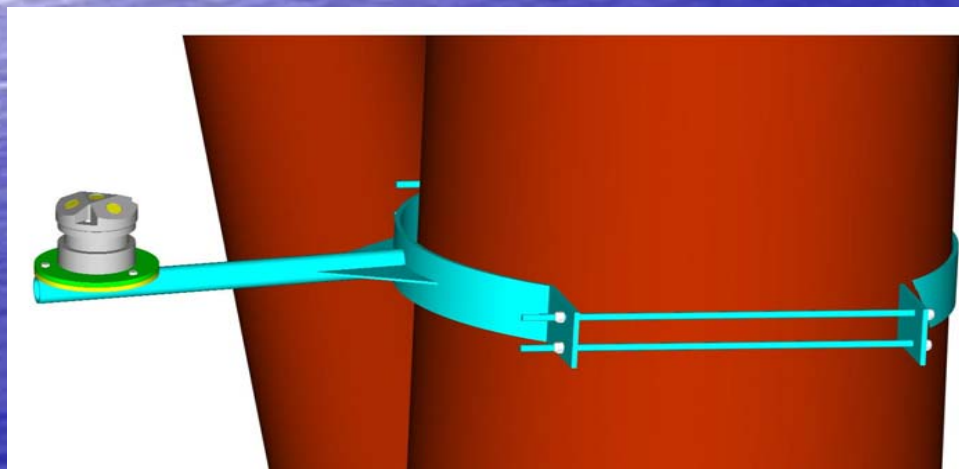
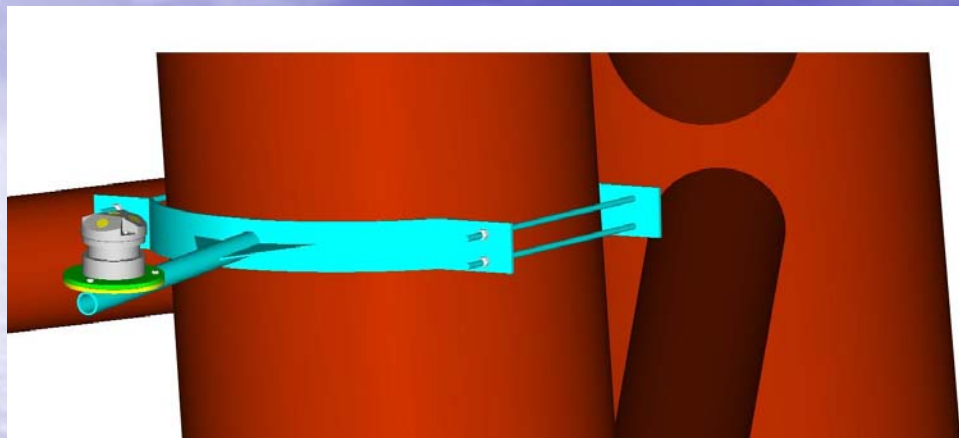
Hardware Installation

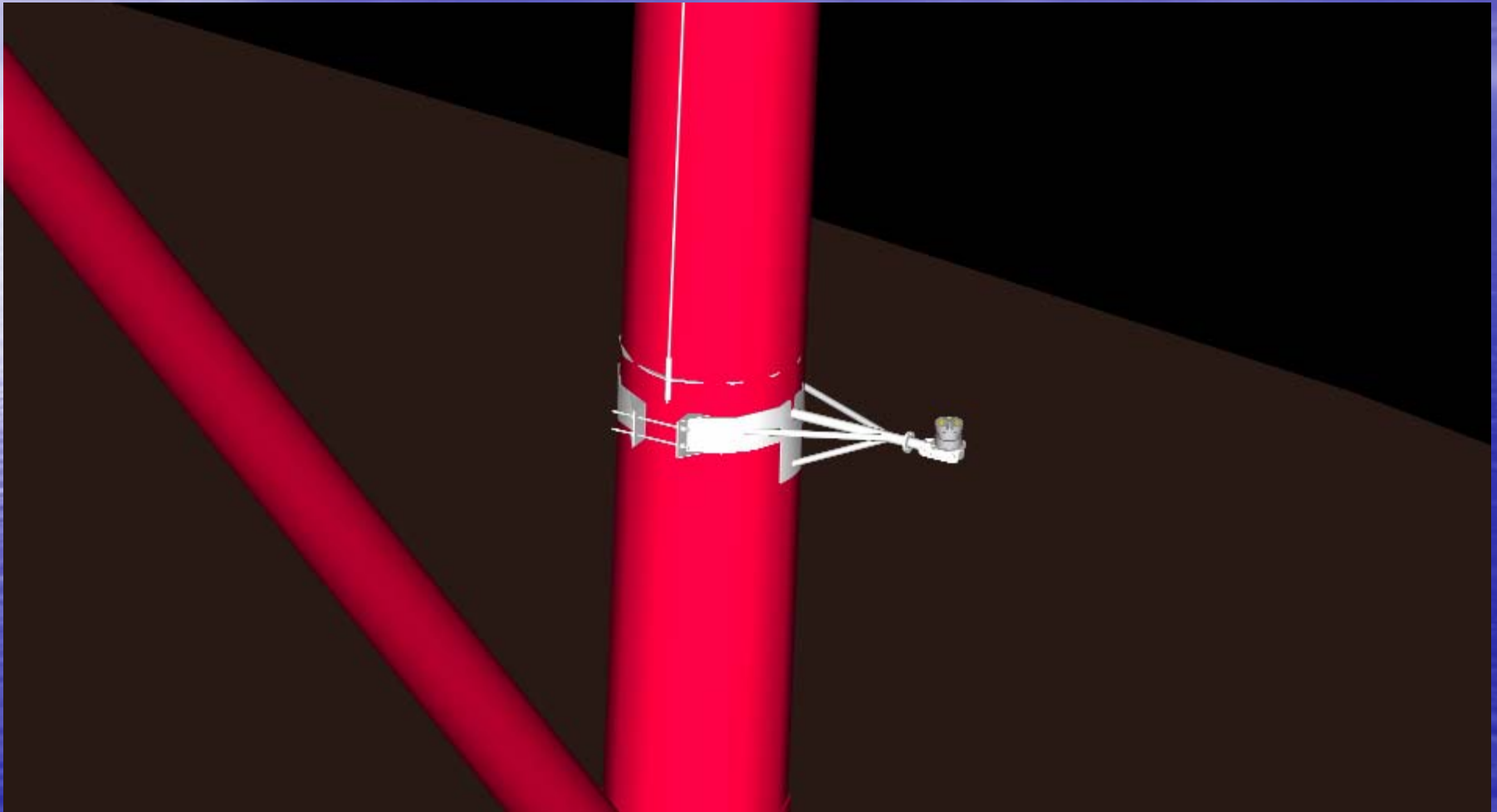


- Once installed, the sensor compass will be adjusted with an offset.
- Sensor will be polled once an hour
- 17 minute wave measurement at 2 Hz
- 5 minute current profile (300 pings)



Hardware Installation







Q & A

