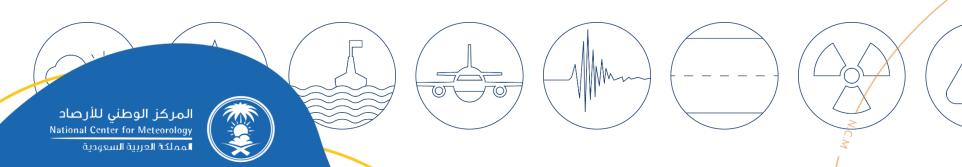


# Design, Supply, Installation, Operation & Maintenance of 5 Met-Ocean Buoys for National Center for Meteorology (NCM)-KSA

**Project: Floating Marine Buoys** 

**Increase the Geographical Coverage of Observation Stations Initiative** 



### INTRODUCTION

The National Center for Meteorology has lunched one Initiative aimed to Increase the Geographical Coverage of Observation Stations related to Surface, Upper air with Remote Sensing.

As part of this initiative NCM launched project to supply and install floating Marine Buoys stations in the Red sea and Arabian Gulf to Observe the Met Oceans.

The Floating Marine buoys station will provide instant data to NCM HQ which will be used for early warning, notifications, further metrological studies and to provide the needed metrological information for the related entities in the kingdom of Saudi Arabia.





### INTRODUCTION

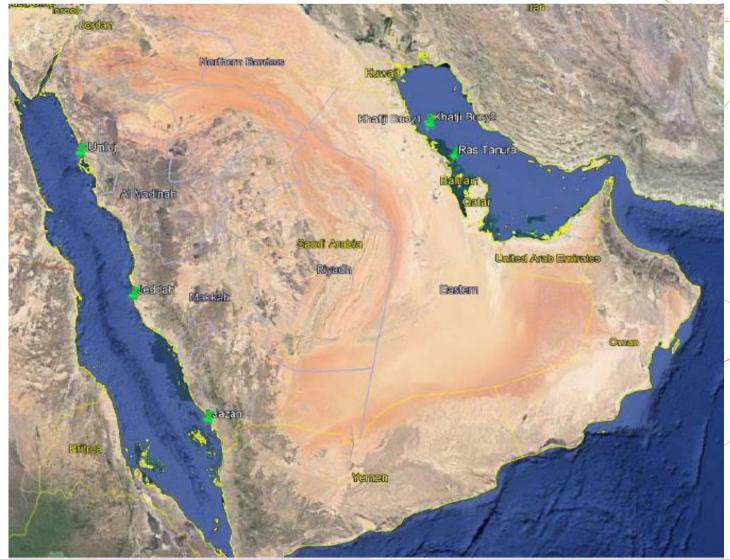
Met ocean Observation is an important field of study for many applications, weather forecasting, climate studies, operations & safety, maritime safety and marine awareness.

Typical Ocean and Coastal Observation buoys gather data of wind speed and direction, waves, currents, atmospheric pressure, air temperature, water temperature, and water quality parameters.

Data is acquired, processed, logged and transmitted through cellular or satellite telemetry to the end user. Buoy based met ocean deployments can be in various locations, from calm shallow water until 5000m depths in the open ocean. Buoys are typically powered by solar panels and rechargeable batteries, which enable them to remain deployed for long periods of time.



# **FLOATING BUOYS LOCATIONS**







# **BUOY LOCATIONS COORDINATES**

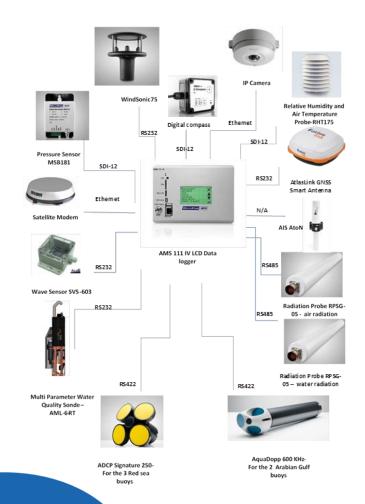
- Deployment site locations are 5 locations 3 in Red sea, and 2 in Arabian Gulf.
- Below are the final 5 locations, where the site survey would be conducted.

Red Sea Site Buoy Location Details								
S.No	Site Location Name	Site Location Co-ordinates	Water Depth at Site Location	Nearest Port				
1.	South of Jeddah	Lat: 21° 4'41.261"N Long: 39° 5'6.91"E	48m	Jeddah Port				
2.	Between Umluj and AlWajh	Lat:25° 46'15.744"N Long: 36° 27'10.897"E	270m	Umluj Port				
3.	Jazan	Lat : 17° 9'38.689"N Long: 42° 6'28.846"E	74m	Jazan Port				
		Arabian Gulf S	ite Buoy Location Det	ails				
4.	Ras Tanura	Lat: 26°36'56.97"N Long: 50°14'40.58"E	14m	Al-Dammam Port & Ras Tanura Port				
5.	Khafji	Lat: 27°39'29.60"N Long: 49°19'24.75"E	11m	Ra's al Khair Port				





# **BUOY SCHEMA**







# **STATION LIST**

#### **Buoy platform**

- Buoy platform
- Hexagonal aluminum topside
- Top side sensor ring mast
- Float Collars
- Marine lantern
- Radar reflector
- Solar panels
- Batteries power pack
- Electronics Enclosure
- Battery Enclosure

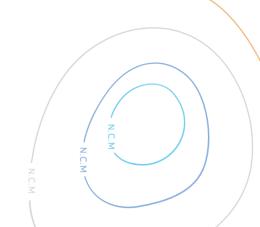




#### Integration of the Marine data buoys to the existing NCM Central System

- The buoy stations has been integrated to the existing NCM UDCS/CLDB software to collect and archive all the marine data as well as meteoroidal data in one unified structure
- The NCM IMS UDCS/CLDB software has been upgraded to accommodate the buoy stations for data acquisition and processing, as well as reporting of met-marine parameters.
- The Upgraded IMS UDCS provides users with easy-to-use and efficient web interface on HTML technology. An authorized user has access to all data, statistics and full functionality from any computer on the network.



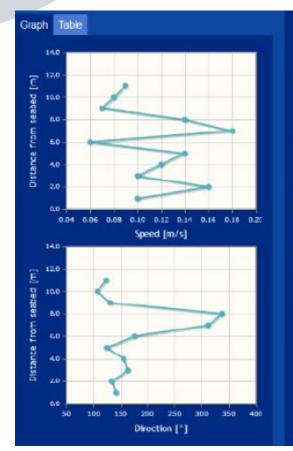












Wave Da	ata
Spectral significant wave height	0.21 m
Significant wave height	0.17 m
Wave height	0.23 m
Max wave height	0.31 m
Mean period	1.8 s
Peak period	2.07 s
Mean zero-crossing period	1.9 s
Direction at peak period	23.47 °
Spreading at peak period	78.95 °
Wave main direction	90.34 °
Wave mean pressure	8.25 dbar
Near surface current speed	0.15 m/s
Near surface current direction	144.88 °

Longitude (x): 48.183298	Latitude (y): 28.999804					
	Sensor Data					
0.21 m	Temperature		21.76 °C			
0.17 m	Pressure_sensor		8.185 dbar			
0.23 m						
0.31 m	Positioning					
1.8 s	Pitch		-4.3°			
2.07 s	Roll		-8.8*			
1.9 s	Heading		363.3 "			
23.47 °	The state of the s					
78.95 °	Instrument Properties					
90.34 °	Sound speed		1635.1 m/s			
8.25 dbar	Awac battery		12.7 V			



## **CERTIFICATES AND COMPLIANCES**

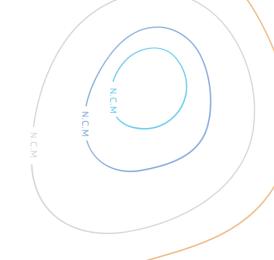
#### Certification provided with buoy:

- 1. IALA Certification.
- 2. Company ISO Certificate.
- 3. Impact test of Poly foam density test.
- 4. Coil and Tensile Test.
- 5. Steel Core test.
- 6. Sensors calibration certificates.

#### WMO conformance and compliance:

Marine Buoys systems fully conforms to the following WMO documents:

- 1. WMO No. 306 Manual on Codes
- 2. WMO No. 386 Manual on Global Telecommunication System



# **Thank You for Your Attention**

