

»ACQUISITION OF A HIGH FREQUENCY RADAR FOR MEASURING SURFACE CURRENTS AND WAVES«

TECHNICAL DESCRIPTION AND SPECIFICATIONS OF THE EQUIPMENT

The subject of public tender is supply of the high frequency radar for measuring surface currents and waves stage that shall be used for INTERREG Italy - Croatia Programme, project FIRESPELL overall objective is to enhance the capacity of Emergency Service Organizations to increase cross-border effectiveness in tackling natural and man-made disasters, decreasing the exposure of the populations to the impact of hazards and increasing the safety of the Croatian and Italian Adriatic basin by improving emergency prevention and management measures and instruments.

TECHNICAL CHARACTERISTICS

The technical characteristics are given exclusively in English in both tender documentations, because the Italian terminology in a specific technical field is not specific enough.

1. General

The ocean radar should provide reliable and accurate ocean surface current velocity, wave height and wind data. Radial component of sea-surface velocity from a single station should be compatible with data from multiple stations to provide maps with current vectors.

System have to be flexible, the same hard- and software should be able to be configured as high resolution short range system or long range system. The reconfiguration should be possible to be carried out by trained personnel.

The ocean radar system (antennas and electronics) should be easy to transport in a van or trailer and to install and operate at various locations.

The radar will be installed on the old dam of Trieste harbor (LAT 45°39.478'N LON: 13°45.669'E)

The ocean radar should provide current mapping, wave direction and height within a range of 25 km in the Gulf of Trieste.

2. Required accuracy

- current velocity bellow 10 cm/s,

- mean wave direction better than 10° (direction is not available from a single station, this parameter strongly depends on the geometry between the two sites),
- mean wave period around 1 s.

3. Single ocean radar station should provide

- radial current velocity on the radials or on a user defined grid,
- significant wave height and period,
- information about data quality on the radials or on a user defined grid.

4. The radar should be integrated in the current HF network of radars operating in the gulf of Trieste

The radar is going to contribute to the gulf of Trieste monitoring jointly with the already operating radars (OGS and NIB). In that configuration it should provide:

- current velocity vectors on a user defined grid,
- wind direction on a user defined grid,
- significant wave height and period on a user defined grid,
- quality flags for each pixel of the user defined grid.

5. Technical Features

- An effective lightning protection system should be integrated.
- An uninterrupted power supply should be integrated to guarantee a secure shut down and storage of all acquired data.
- The local data storage should archive at least 6 months of raw data.

6. Indoor and outdoor components

Indoor components (two year warranty)

- 1 x system hardware (12 channels), control software and license for current, wave and wind mapping, with a user interface PC for remote control of the system.

Outdoor components

- 12 x Receivers Antennas
- at least 4 x Transmitter Antennas

Other hardware

- Air conditioner with separate inverter, >12000 BTU including installation by a local service company
- 2 x Video Camera system, with solar panel and wireless data link, including mast, mounting material and outdoor installation

- Server for running the DataViewer and the Ocean Current Drift Prediction software.
- APC UPS 2200 VA rack mounted

The antenna system should be robust, resistant to strong winds, easy to transport and to install.

7. Special Features

- The ocean radar should transmit low RF-power (max. 30 W) to avoid interference with other radio services and to allow an absolutely safe operation, even if the antennas are installed in public reach.
- The ocean radar should be modular to be configured to operate with a compact antenna system in Direction Finding as well as with an array type antenna system in Beam Forming.
- Multiple radar systems should be able to share the same frequency band.

8. Software should provide

- accessibility to radar parameters via a web interface,
- possibility to monitor all relevant system hardware parameter,
- automatic warnings generated and transmitted in case of critical operation situations.
- Data management and viewing software, including training for users
- Ocean Current Drift Prediction software including training for users
- real time processing,
- noise reduction features,
- Direction Finding methods,
- software for beam forming with automatic antenna array calibration,
- oceanographic software to extract current, wind and wave parameters, programmable with individually optimized integration time,
- quality control packages,
- export of data in various formats.

9. Software for the central station should provide

- data viewing tools to display processed data,
- data converter to archive data in various formats.

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