GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
SURVEY OF INDIA

EXPRESSION OF INTEREST (EOI) FOR ESTABLISHMENT OF FALLBACK REAL TIME TIDAL & GNSS DATA TRANSMISSION SYSTEM

EOI No. S- 01 /15-P-8(RTDT) dated 25/07/2017

EOI INVITED BY

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NOTICE INVITING EXPRESSION OF INTEREST

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FOR

PROCUREMENT OF FALLBACK DATA COMMUNICATION SYSTEM FOR REAL TIME TIDAL AND GNSS DATA

1. INTRODUCTION

Geodetic & Research Branch of the Survey of India has the mandate to carry out systematic tidal observations along the Indian coastline and islands. To record the tidal data, Survey of India has established a large network of tidal observatories at selected locations along the Indian coasts and islands. Earlier, mechanical gauges were used to record the tidal data. The great tsunami of 26th December, 2004 paved the path of modernization of Indian tide gauge network. To quench the increasing demand of tidal data for various scientific purposes, especially for monitoring of extreme events like tsunami and storm surges, Survey of India has initiated a project for modernization and expansion of tide gauge network along the east and west coast of India and islands with the financial assistance from Department of Science & Technology, Govt. of India, Under this project, Survey of India has equipped all its tidal observatories with state-of-the-art digital tide gauges co-located with dual frequency GNSS receivers and Real Time data transmission facilities through dedicated VSAT network.

For real time data transmission, an intranet based VSAT network was established. Under this network, all the tidal observatories were equipped with VSAT system for tidal data transmission and a National Tidal Data Centre and National GNSS Data Centre was established in Geodetic & Research Branch of the Survey of India, Dehradun.

This system has proven its strength several times during monitoring of extreme events in past one decade, but with the passage of time it has been observed that during last one decade, a lot of new technologies have emerged, which are more sturdy and economically viable for our requirement. Therefore, this office intended to adopt to one of such viable solutions as a fallback option.

2. PLAN

Tide gauges are used to record the sea level data, therefore these are kept in a cabin like structure constructed near the sea coast on the platform, extended towards sea. In addition to tide gauges, GPS receivers are also installed at these locations. Data recorded by both the instrument (Tide Gauge and GPS) is required to be transmitted from tidal observatories to National Tidal Data Centre and National GNSS Data Centre, Geodetic & Research Branch, Survey of India, Dehradun. In most of the places where tidal observatories are located, telephone communication (land line) is not available and also not advisable because of unsuitability of laying cables etc. It is preferable to establish wireless link for communication of data between the remote tidal stations and National Tidal Data Centre and National GNSS Data Centre at Dehradun. Since this data is a secured data therefore possibility of encryption of data at transmitting stations and decryption of same at receiving station should also be explored.

Approximate Size of data files:

1. Tide Gauge Data - 200 kb (approx.) per day from each observatory
2. GPS - 5 MB (approx.) per day from each observatory

Instruments used in data collection

1. **Digital Tide Gauge:** It is a Pressure Sensor and Shaft Encoder Tide Gauge which displays data at one second interval. It also stores the data at every minute by taking average of the samples taken during that particular minute. This creates data file for each day and data logger can store data upto one month or so. Presently, each data logger has been assigned a unique IP address and can be accessed remotely through dedicated VSAT network for configuration and data downloading.
2. **Dual Frequency GPS Receivers:** This instrument records data at one second interval and attached with MOXA Box which transform the data from RS-232 to Ethernet based IP address. This Moxa Box is also having unique IP address and can be accessed remotely for data downloading. Some new systems are also available which can directly be assigned IP address and accessed remotely for data downloading.

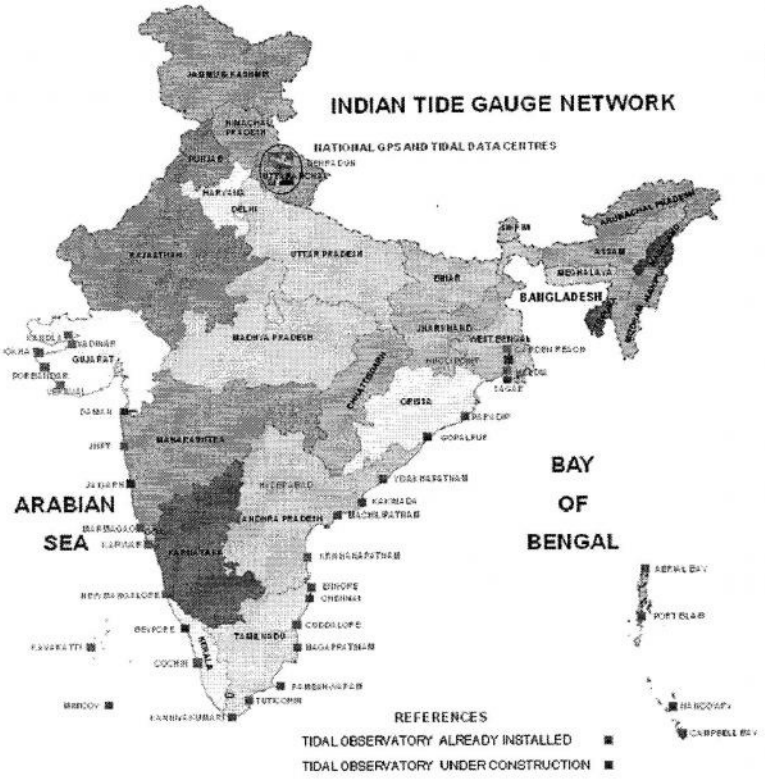
3. AREA OF WORK FOR ESTABLISHMENT OF COMMUNICATION SYSTEM:

National Tidal Data Centre and National GNSS Data Centre need to be established at G&RB, SOI, Dehradun. Detail of tide gauge locations where communication system is required to be established are tabulated below. A chart showing locations is also attached.

Locations of Tide Gauge Stations:

Sl. No.	Station	Latitude	Longitude	State	Remarks
1	VISAKHAPATNAM	17 41 N	83 17 E	Andhra Pradesh	Located in port premises.
2	MARMAGAO	15 25 N	73 48 E	Goa	Located in port premises.
3	ENNORE	13 15 N	80 20 E	Tamilnadu	Located in port premises.
4	COCHIN	09 58 N	76 16 E	Kerala	Located in port premises.
5	KANDLA	23 01 N	70 13 E	Gujarat	Located in port premises.
6	KAVARATTI	10 34 N	72 38 E	Lakshadweep Islands	Located in port premises.
7	MINICOY	08 17 N	73 03 E	Lakshadweep Islands	Located in port premises.
8	PORT BLAIR	11 41 N	92 46 E	Andaman & Nicobar Islands.	Located in port premises.
9	NAN COWRY	08 03 N	93 33 E	Andaman & Nicobar Islands.	Located in port premises.
10	HALDIA	22 02 N	88 06 E	West Bengal (in Hugli River)	Located in port premises.
11	CHENNAI	13 06 N	80 18 E	Tamilnadu	Located in port premises.
12	TUTICORIN	08 45 N	78 12 E	Tamilnadu	Located in port premises.
13	MACHILIPATNAM	16 09 N	81 10 E	Andhra Pradesh	Located in port premises.
14	PARADIP	20 16 N	86 42 E	Orissa	Located in port premises.
15	GARDEN REACH	22 33 N	88 18 E	West Bengal (in Hugli River)	Located in port premises.
16	KARWAR	14 48 N	74 07 E	Karnataka	Located in port premises.
17	NEW MANGALORE	12 55 N	74 48 E	Karnataka	Located in port premises.
18	VADINAR	22 27 N	69 41 E	Gujarat	Located in port premises.
19	AERIAL BAY	13 17 N	93 02 E	Andaman & Nicobar Islands.	Located in port premises.
20	CAMPBELL BAY	07 00 N	93 56 E	Andaman & Nicobar Islands.	Located in port premises.
21	KRISHNAPATNAM	14 15 N	80 08 E	Andhra Pradesh	Located in port premises.
22	JNPT, NAVI MUMBAI	18 55 N	72 45 E	Maharashtra	Located in port premises.
23	NAGAPATTINAM	10 46 N	79 51 E	Tamilnadu	Located in port premises.
24	OKHA	22 28 N	69 05 E	Gujarat	Located in port premises.
25	PORBANDAR	21 38 N	69 37 E	Gujarat	Located in port premises.
26	VERAVAL	20 54 N	70 22 E	Gujarat	Located in port premises.
27	KAKINADA	16 56 N	82 15 E	Andhra Pradesh	Located in port premises.
28	CUDDALUR	11 47 N	79 45 E	Tamilnadu	-
29	RAMESHWARAM	09 16 N	79 12 E	Tamilnadu	-
30	KANNIYA KUMARI	08 05 N	77 32 E	Tamilnadu	-
31	GOPALPUR	19 16 N	84 55 E	Orissa	YET TO BE FINALISED
32	BEYPORE	11 10 N	75 48 E	Kerala	YET TO BE FINALISED
33	ROY CHAK			West Bengal (in Hugli River)	YET TO BE FINALISED
34	MAGDALLA			Gujarat	YET TO BE FINALISED
35	DAMAN			Daman	YET TO BE FINALISED
36	JAIGARH			Maharashtra	YET TO BE FINALISED

Stations from Sl. No. 1 to 30 have already installed and remaining 6 sites have yet to be finalized.



4. OBJECTIVE:

The main objective of this project is to establish fallback data communication system for transmitting tidal and GPS data from tidal observatories and receiving at National Tidal Data Centre and National GNSS Data Centre, Geodetic & Research Branch, Survey of India, Dehradun.

5. SCOPE OF THE WORK:

(i) Establishment of communication system along with encryption unit at remote locations as tabulated above and making them compatible with the tide gauges and GPS receivers for real time transmission of data.

(ii) Establishment of communication system with decryption unit at National Tidal Data Centre and National GNSS Data Centre located in Geodetic & Research Branch, Survey of India, 17, E.C. Road, Dehradun.

6. IMPLEMENTATION OF THE PROGRAMME:

The Director, Geodetic & Research Branch SOI intends to procure the communication system as elaborated above. He will implement the programme with financial and technical supports from Surveyor General of India and the Dept. of Science & Technology, Government of India in the financial year 2017-18.

7. FUNDING:

The Ministry of Science & Technology will provide the funds for the project.

8. PROCEDURE FOR SUBMISSION OF OFFERS BY THE INTERESTED COMPANIES / ORGANIZATIONS.

The expression of interest from reputed and experienced organizations having similar experience is being invited for offering the communication system suitable for the subject task. Interested organizations need to provide the following:

(i) Detailed architecture and functioning of the communication system offered for the subject task.

(ii) Minimum infrastructure required in terms of computers / servers / UPS / Electricity / redundant supply through solar power panel and other peripherals (if any) at each station.

(iii) One time expenditure for procurement of instrument / equipments required for receiving and transmitting stations separately for per unit items.

(iv) Recurring expenditure in terms of hiring the data uses and Annual maintenance contract.

The interested companies / organizations can submit their expression of interest for above task. Offers shall be submitted in sealed envelopes clearly super scribing the **'EXPRESSION OF INTEREST FOR FALLBACK REAL TIME DATA TRANSMISSION SYSTEM'**. Offers with requisite documents should be sent to the office of **The Director, Geodetic & Research Branch, Survey of India, 17, E.C. Road, P.B. No. 77, Dehradun – 248 001 (Uttarakhand)** latest by 16:00 hrs (local time) on 28.08.2017.

Chairman Board