**CSIR-NATIONAL PHYSICAL LABORATORY,
TIME & FREQUENCY AND ELECTRICAL &
ELECTRONICS METROLOGY DIVISION,
GOVERNMENT OF INDIA.**

CSIR-NPL/DU2/EOI/01062017

REQUEST FOR EXPRESSION OF INTEREST (EOI)

SETTING UP OF REQUIRED INFRASTRUCTURE FOR DISSEMINATING INDIAN STANDARD TIME ACROSS INDIA USING LONG WAVE RADIO (LWR) AND/OR NETWORK TIME PROTOCOL (NTP) AND/OR TELEPHONE LINES AND/OR TWO WAY SATELLITE TIME AND FREQUENCY TRANSFER (TWSTFT) AND/OR COMMON VIEW GLOBAL NAVIGATIONAL SATELLITE SYSTEMS (CVGNSS) BASED TRANSMISSION.

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01 June 2017

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DISCLAIMER

This Request for Expression of Interest (EOI) is not an offer by the CSIR-National Physical Laboratory (CSIR-NPL), India, but an invitation to receive responses from eligible and interested Indian Companies for "SETTING UP OF REQUIRED INFRASTRUCTURE FOR DISSEMINATING INDIAN STANDARD TIME ACROSS INDIA USING LONG WAVE RADIO (LWR) AND/OR NETWORK TIME PROTOCOL (NTP) AND/OR TELEPHONE LINES AND/OR TWO WAY SATELLITE TIME AND FREQUENCY TRANSFER (TWSTFT) AND/OR COMMON VIEW GLOBAL NAVIGATIONAL SATELLITE SYSTEMS (CVGNSS) BASED TRANSIMMISION"

The IST deamination will be at no cost CSIR-NPL. No contractual obligation whatsoever shall arise from the EOI process until and unless a formal Memorandum of Understanding (MoU) is signed and executed between CSIR-NPL, India and the selected respondents.

Director CSIR-NPL, India reserves the right to terminate project at any stage.

The EOI document is available on www.nplindia.org and is available for download.

The completed proposal, containing two hard copies of the Expression of Interest, should be submitted in a

Sealed cover superscripted with **"Expression of Interest to Disseminate Indian Standard Time"** before the last date and time to the following address:
Controller of Administration (COA), CSIR-National Physical Laboratory, Dr. K.S. Krishnan Marg, New Delhi-110 012.

Late Applications: Any application received after closing date and time, i.e., 13.00 hours (IST) on 30-06-2017 will not be accepted and shall be summarily rejected.

SCHEDULE OF EVENTS	
Document available on	**www.nplindia.org**
Last Date and Time for Submission of EOI	30.06.2017 Before 13.00 hrs (IST).
Mode of EOI submission	Two Hardcopies (physical form) one original & one duplicate in sealed envelopes.
Date and Time for opening EOI responses.	30.06.2017 14.00 hrs (IST)
CONTACT DETAILS	
For any enquiries	Dr. Subhadeep De Scientist Time & Frequency and Electrical & Electronics Metrology Division, Room No 128 main building, CSIR-National Physical Laboratory, Dr. K.S. Krishnan Marg, New Delhi 110012. Tel: 011-4709 1589 Fax: 011-45609210 e-Mail ID: subhadeep@nplindia.org

DEFINITIONS

Definitions of terms not defined herein shall have the meaning ascribed to them under the EOI document. In addition to terms defined elsewhere, the following terms herein shall have the meaning ascribed to them below:

"Consortium"	If a single bidder does not have the requisite capability to design, develop, provide, manage and maintain the critical components of the project, then the providers of such critical components should necessarily form a consortium with the primary responsibility of providing the service resting with the lead member of the consortium**.**
"Consortium and Consortia"	shall have the same meaning;
"Foreign Partner"	International Company having experience with technical and commercial capabilities of implementing LWR and/or NTP and/or telephone lines and/or TWSTFT and/or CVGNSS based projects.
"Indian Company"	The Selected Respondent itself or, where applicable, an SPV incorporated by the Selected Respondent for the purposes of the implementation and operation and management of the Project along with its foreign partner or consortia as its lead member.
"Special Purpose Vehicle"	The subsidiary company with an asset/ liability structure and legal status that makes its obligations secure even if the parent company goes bankrupt.
"Project"	The design, procurement, supply; implementation and maintenance of LWR and/or NTP and/or telephone lines and/or TWSTFT and/or CVGNSS transmission stations.
"Proposal"	The **EOI** submitted by a Respondent in the prescribed format.
"Respondents"	A reputed Indian company or a consortium of companies having a base in foreign and having the requisite experience supporting the Indian company who has applied for the EOI.
"**Stakeholders**"	The contractors, citizens, businesses, Government departments and other agencies of the Government of INDIA and their employees.

ACRONYMS

BIPM means International Bureau of Weights and Measures / Bureau international des poids et mesures

CSIR means Council of Scientific and Industrial Research

EOI means Expression of Interest

ISP means Internet Service Provider

ISRO means Indian Space Research Organization

IST means Indian Standard Time

LEA means Law Enforcement Agencies

LWR means Long Wave Radio

NTP means Network Time Protocol

TWSTFT means Two Way Satellite Time and Frequency Transfer

CVGNSS means Common View Global Navigational Satellite Systems

NIST means National Institute of Standards and Technology

NMI means National Metrology Institute

CSIR-NPL means CSIR-National Physical Laboratory of India

REOI means Request for Expression of Interest

RFP means Request for Proposal

TSP means Telecom Service Providers

ITR means Income Tax Return

PAN means Permanent Account Number

SPV means Special Purpose Vehicle

REQUEST FOR EXPRESSION OF INTEREST FOR

SETTING UP OF REQUIRED INFRASTRUCTURE FOR DISSEMINATING INDIAN STANDARD TIME ACROSS INDIA USING LONG WAVE RADIO (LWR) AND/OR NETWORK TIME PROTOCOL (NTP) AND/OR TELEPHONE LINES AND/OR TWO WAY SATELLITE TIME AND FREQUENCY TRANSFER (TWSTFT) AND/OR COMMON VIEW GLOBAL NAVIGATIONAL SATELLITE BASED TRANSMISSION.

CSIR-National Physical Laboratory **(CSIR-NPL)** invites for **"Expression of Interest" (EOI)** proposal from suitably experienced and financially sound Indian companies, their foreign partner or consortia as the case may be, to enter into a long term mutual understanding for alliance to setup the required infrastructure for disseminating Indian Standard Time using Long Wave Radio (LWR) and/or Network Time Protocol (NTP) and/or telephone lines and/or Two Way Satellite Time and Frequency Transfer (TWSTFT) and/or Common View Global Navigational Satellite Systems (CVGNSS) technologies based transmission in accordance with applicable laws, regulations and policies under the Indian wireless and telegraphic Act updated.

The last date for submission of completed proposal is no later than 13:00 hrs (IST) on 30/06/2017 either by hand or by courier or *via* registered mail to reach the address given below. The authority is not responsible for any postal delays or consequences thereof.

Controller of Administration (COA)
CSIR-National Physical Laboratory,
Dr. K.S. Krishnan Marg,
New Delhi 110012
Tel: 011- 4560 9203
Fax: 011-2584 8846
E-Mail ID:coa@nplindia.org

The applications will be evaluated in accordance with the general conditions, and evaluation criteria to shortlist eligible respondents as prescribed in the EOI document**.**

BACKGROUND

CSIR-NPL is the National Metrology Institute (NMI) of India and has the mandate for establishment, maintenance and dissemination of International Systems (SI) units of physical measurements i.e. metre, kilogram, second, ampere, Kelvin, mole and Candela through continuous research and development.

TIME SCALE FOR GENERATION OF IST AT CSIR-NPL

CSIR-NPL, the *Timekeeper of India,* generates the *Indian Standard Time (IST)* using "Primary time scale" which is ensemble of five caesium clocks and one hydrogen maser. The present accuracy of the IST is ±20 nano-seconds. CSIR-NPL has been disseminating the IST to various users (in particularly to strategic sectors, including ISRO, Indian Air Forces, airports, banking sectors, parliament etc.) for the past several decades through tele-clock, two-way satellite link and Network Time Protocol (*time.nplindia.org*) services.

Presently we are strengthening the primary time scale which is heart of the IST generation and the uninterrupted dissemination service depends upon it. Recently we have replaced the existing aged clocks and few more will be added to the consortium down the line. This will strengthen the primary time scale. We are in the process of establishing a back-up Primary Time Scale, which will be completed by December 2017. This will also act as the backup for the new time scale. In addition, to provide a fail-safe IST, a disaster recovery centre (DRC) has also been planned in a seismically stabilized zone that will be connected with primary reference clock using optical fibre as well as two-way satellite link.

GENERAL SCOPE OF THE PROJECT

In order to disseminate IST throughout the India by using most common technologies, CSIR-NPL is considering a long term alliance together with mutual understanding with the experienced and financially sound Indian companies,

their foreign partner or consortia, as case may be, to disseminate time signals by setting up the following technologies as,

1 Long Wave radio transmission (LWR): Time is also being disseminated using long wavelength radio waves in the frequency range of 120 – 150 kHz with the installation of transmission station at different places. Each station has coverage of approximately 1000 km radius. Each radio station will have secondary frequency standards (i.e. Cesium beam frequency standard) which will be synchronized to the National time. This long wavelength radio frequency dissemination technique is advantageous since it travels through ground and work without any telephone or internet connections. Very cheap receiver can receive this signal for IST synchronization hence the technology can reach to every door steps.

2. Network Time Protocol (NTP): NTP is an internet standard protocol which uses a reliable time source as reference for precise synchronization of servers and network devices. NTP servers follow a hierarchy with Stratum 0 as the "Primary Reference Clock" located at the National Metrology Institute of the country, in India this is at the CSIR-NPL, and can go up to Stratum 15. A primary server (referred to as a stratum 1) is a server that receives a UTC time signal directly from an authoritative clock source, e.g. atomic clock or GPS signal source. A stratum 2 server receives its time signal from a stratum 1 server, a stratum 3 server from stratum 2 servers, and so on. Clients peer with servers in order to synchronize their internal clocks to the NTP time signal. All the network devices can be synchronized to the IST using this user friendly technology.

3. Telephone line transmission: The time is disseminated to the users via telephone. The required transmitters are attached to dedicated phone lines and the transmitters are synchronized to the National time. The users can access the National time by connecting the commercially available receivers to a telephone line. The synchronization uncertainty of ±1s is routinely obtained using this service. Upgraded this version is capable of providing time synchronization with an uncertainty of ±10 ms. The improvement in uncertainty comes from the use of communication delay compensation scheme where on establishing the call between the transmitter and receiver, the transmitter algorithm estimates the round trip delay and compensates it in the transmitted time.

4. Two-way satellite time and frequency transfer (TWSTFT): The TWSTFT technique utilizes a telecommunications geostationary satellite to compare clocks located in two different positions, *i.e.,* at receiving and emitting stations. Two-way observations are scheduled between pairs of laboratories so that their clocks are simultaneously compared at both ends of the baseline using the satellite's transponder. With the installation of automated stations in most laboratories, the TWSTFT link observations among the stations can be made at regular intervals, with the consequence of achieving a statistical uncertainty below few ns.

5. Common View Global Navigational Satellite System (CVGNSS): The CVGNSS method compares two clocks that are located at different sites. The common-view clock signal is simply a vehicle used to transfer time from one site to the other. The time signal embedded in a GNSS signal is the most commonly used source of common-view clock because of its wide visibility, ease of reception with good signal to noise ratio and insensitivity to propagation effects. CVGNSS time transfer is a one-way method, the signal being emitted by a satellite and received by specific equipment installed in a laboratory. Estimating all systematic uncertainties, accurate time synchronization can easily be achieved by the CVGNSS method. Dual-frequency receivers remove the ionospheric delay and improve the time transfer accuracy.

PURPOSE OF THIS DOCUMENT

The purpose of this document is to:

- Formally advise the market of the project and the services that CSIR-NPL seeks to have delivered;
- Communicate to the market, the evaluation criteria and procedures that will be followed to shortlist respondents, who would be then invited to submit a final proposal, and
- Confirm the scope of market interest in the project and obtain expressions of interest in the project from the Respondents to compile a list of interested entities.

ELIGIBILITY CRITERIA FOR SUBMITTING EOI

Only companies registered in India, their foreign partner or consortia, as the case may be, meeting the following eligibility criteria may apply:

a) Indian company will only be allowed to submit EOI and will lead the project for setting up of the infrastructure for either-of-the or few or all among the LWR and/or NTP and/or telephone lines and/or TWSTFT and/or CVGNSS based technologies for disseminating IST across India.
b) Indian company, its foreign partner or consortia, as the case may be, should have established and operating either of the or few or all among LWR and/or NTP and/or telephone lines and/or TWSTFT and/or CVGNSS technologies based services for at least 5 years before the date of this advertised EOI.
c) Indian company, its foreign partner or consortia, as the case may be, should have combined minimum annual turnover of INR 50 crore for which documentary proof is required.
d) Currently this invitation is open only to Indian companies having registered office or business within India. However, for meeting the eligibility criteria, the company may have foreign partner or consortia.

DOCUMENTS CONSTITUTING THE EOI

The EOI prepared by the Respondents shall comprise the following components (*more details are provided in ANNEXURE "A")*

I. Indian company details, registration no, registration date and general Information.
II. Foreign partners and consortia details of the Indian companies.
III. Financial Information e.g. ITR of last three years, PAN etc.
IV. Technical competence & alliances
V. Technical commercial proposal for setting up of the required infrastructure for disseminating the IST using the LWR and/or NTP and/or telephone lines and/or TWSTFT and/or CVGNSS based transmission technologies.
VI. Technical and financial details of similar projects undertaken earlier
VII. The respondent may provide any additional element that it wishes to convey to the selection committee.

VALIDITY OF EOI

EOI will remain valid for 180 days after the date of opening prescribed by the CSIR-NPL. CSIR-NPL holds the rights to reject a bid valid for a period shorter than 180 days as non-responsive, without any correspondence. In exceptional

circumstances, CSIR-NPL may request the respondents for an extension of the period of validity. The request and the responses thereto shall be made in writing.

FORMAT, SEALING, MARKING AND SIGNING OF EOI

Interested Respondents are required to provide all the information listed in Annexure A along with EOI proposal in physical form.

I. The respondents shall submit two copies of the complete proposal (one original and one duplicate) of EOI in physical format.
II. The physical copies of proposal towards the EOI with all the supporting documents shall be placed in a sealed envelope clearly marking. **"Request for Expression of Interest to Disseminate Indian Standard Time"**
III. The sealed envelope must be submitted along with all relevant documents no later than 13:00 hrs (IST) by 30 June 2017 either by hand or by courier or *via* registered mail to reach at the specified address. The authority is not responsible for any postal delays or any consequences thereof.

EVALUATION CRITERIAL FOR SHORTLISTING

The proposal will be evaluated by an expert committee and its decision will be final and binding to all concerned.

GOVERNING LAWS

The rights and obligations of the CSIR-NPL and the Respondents under this EOI will be governed by the prevailing laws of India + Arbitration clause (Indian court)

ARBITRATION

In case of any dispute, the matter will be placed in Delhi jurisdiction.

FINAL REQUEST FOR PROPOSAL

On completion of the shortlisting process, CSIR-NPL may issue a RFP for the final selection of eligible respondent company.

RESERVED RIGHTS OF CSIR-NPL

CSIR-NPL may for any reasons; add/ modify/ amend/ relax/ cancel any terms/ conditions/ criteria of the EOI document during any stage of the EOI process and such amendments shall be binding on all the bidders.

CSIR-NPL at its own discretion reserves the right to reject any Proposal, modify or scrap the whole EOI at any time, without assigning any reason or incurring any liability.

As part of the evaluation process, CSIR-NPL may seek additional information and clarification from e respondents.

Director CSIR-NPL reserves the right to modify/ change the dates of EOI opening/ submission at its own discretion and these changes shall be binding on the bidders.

Annexure "A"

Documents Constituting EOI

Indian Company Details:

- Name of the company and date of registration
- Details of ownership structure of the company (joint ventures & subsidiaries)
- Company profile
- Organisation structure
- Global footprint
- Designated contact and position held in the organisation
- Address (number, street name, city, postal code and country) of head office location
- Contact email address
- Company web site URL

Foreign partner and consortia details

Details (*similar to Indian company)*and profile of Foreign partnersthat are interested in being part ofIndian company and are capable of bringing in the necessary expertise and financing to ensure successful rollout and commercial operations of the project.

Financial Information

Global annual revenue in INR/USD of last three years.

Details of ownership structure of the Indian company and foreign partner or consortia.

Technical Competence & Alliances

Brief Description of the either-of-the or few or all among LWR and/or NTP and/or telephone lines and/or TWSTFT and/or CVGNSS based transmission related relevant experience.

Previous experience on LWR and/or NTP and/or telephone lines and/or TWSTFT and/or CVGNSS based transmission project and services.

Complete project details

Technical and financial details of similar projects undertaken

The respondent may provide any additional element that it wishes to convey to the selection committee.

CSIR-NATIONAL PHYSICAL LABORATORY

Dr. K.S. Krishnan Marg, New Delhi -110012, India
Ph.: 011-45609203; Email: coa@nplindia.org
Website: www.nplindia.org

EXPRESSION OF INTEREST

CSIR- National Physical Laboratory (CSIR-NPL), New Delhi, India invites Expression of Interest (EOI) from the interested and competent Indian companies for **"Setting up Required Infrastructure for Disseminating Indian Standard Time (IST)"** across India using Long Wave Radio (LWR) transmission and/or Network Time Protocol (NTP) and/or telephone lines and/or Two Way Satellite Time and Frequency Transfer (TWSTFT) and/or Common View Global Navigational Satellite Systems (CVGNSS).[a]

No contractual obligation whatsoever shall arise from the EOI process until and unless a formal Memorandum of Understanding (MoU) is signed and executed between CSIR-NPL and the parties. CSIR-NPL reserves the right to terminate the project at any stage.

The interested companies may submit their EOIs in duplicate copies and in sealed envelope along with their credentials, technical capabilities and financial standings with recent track record to the Controller of Administration (COA), CSIR-NPL by post followed by an e-mail, on or before 30.06.2017 by 13:00 hours IST. All rights shall be reserved with the Director, CSIR-NPL, whose decision shall be final and binding upon all the firms participating in this process.

[a] Details of EOI can be found at **www.nplindia.org.**

सी.एस.आई.आर.- राष्ट्रीय भौतिक प्रयोगशाला

डॉ. के.एस. कृष्णन मार्ग, नई दिल्ली-110012, भारत
दूरभाष: 011-45609203; ई-मेल: coa@nplindia.org
वेबसाइट: www.nplindia.org

अभिरुचि की अभिव्यक्ति

सीएसआईआर–राष्ट्रीय भौतिक प्रयोगशाला (सीएसआईआर–एनपीएल), नई दिल्ली, भारत दीर्घ तरंग रेडियो (LWR) ट्रांसमिशन और/अथवा नेटवर्क टाइम प्रोटोकोल (NTP) और/अथवा टेलीफोन लाइन और/अथवा द्विमार्गी उपग्रह समय तथा आवृत्ति ट्रांसफर (TWSTFT) और/अथवा कॉमन व्यू ग्लोबल नेविगेशनल सेटेलाइट सिस्टम (CVGNSS)[1] के माध्यम से समस्त भारत में **''भारतीय मानक समय** (IST) **के प्रसार हेतु आवश्यक आधारभूत संरचना स्थापित''** करने हेतु इच्छुक तथा सक्षम भारतीय कम्पनियों से अभिरुचि की अभिव्यक्ति (ईओआई) आमंत्रित करता है।[क]

जब तक कि सीएसआईआर–एनपीएल तथा दूसरे पक्षों के मध्य औपचारिक समझौता ज्ञापन पर हस्ताक्षर कर निष्पादित नहीं किया जाता तब तक अभिरुचि की अभिव्यक्ति से किसी प्रकार की संविदागत बाध्यता उत्पन्न नही हो सकती। सीएसआईआर–एनपीएल को यह अधिकार है कि वह किसी भी स्तर पर इस परियोजना को समाप्त कर सकता है।

इच्छुक कम्पनियां अपने प्रत्यय पत्र, तकनीकी क्षमताओं तथा वर्तमान उपलब्धियों सहित वित्तीय स्थिति संबंधी विवरण अपनी अभिरुचि की अभिव्यक्ति की डुप्लीकेट प्रति के साथ बंद लिफाफे में डाक तथा ई–मेल द्वारा प्रशासन–नियंत्रक (COA) सीएसआईआर–एनपीएल को दिनांक 30.06.2017 को 13:00 बजे तक जमा करवा दें। सभी अधिकार निदेशक, सीएसआईआर–एनपीएल के पास सुरक्षित रहेंगे जिनका निर्णय इस प्रक्रिया में भाग लेने वाली सभी फर्मों के लिए अंतिम एवं बाध्य होंगे।

[क] ईओआई का विस्तृत विवरण **www.nplindia.org** पर प्राप्त हो सकता है।