

'Will Strengthen India's Cybersecurity': NPL Scientist Explains Why Legal Status For IST Matters

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The change in Legal Metrology IST Rules, 2026 is vital as several critical services depend on precise and verifiable timestamps, reports Saurabh Shukla.



Representational image (ETV Bharat)

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New Delhi: With the Legal Metrology, Indian Standard Time (IST) Rules, 2026 notified on August 27, the country is moving towards making IST the common legal time reference for official, commercial and administrative use. The rules will take effect after a 180 day transition period, giving institutions time to align their systems.

The change is quite significant as banking, online payments, telecom services, transport, power systems and government networks largely depend on precise and verifiable timestamps. In an interview with ETV Bharat, Dr Poonam Arora, Scientist & Head, Time & Frequency Metrology Division, CSIR-National Physical Laboratory explains what the new framework changes, how IST traceability will work in practice and what it means for businesses, critical sectors and ordinary users.

ETV Bharat: India has followed Indian Standard Time for decades. What changes now that IST is being made the common legal reference for official and commercial purposes?

Dr Poonam Arora: Essentially the change gives IST legal sanctity and establishes it as the reference that can be relied upon for official and legal purposes. What changes now is its legal status. In many developed countries, the time maintained by the National Metrology Institute is recognised as the legal time. In India, while IST has long been the national reference, there was no legal requirement compelling organisations to ensure that their systems were synchronised with time traceable to IST.

That has become increasingly important because so much of our activity has moved to digital platforms—online banking, UPI payments, social media, high-speed trading and other online services. We are also dealing with cyber fraud and disputes where the exact timing of a transaction can become important. On a standalone computer, for instance, a person can manually change the time.

Once there is a legal framework, however an organisation may be required to demonstrate that the timestamp on its system was traceable to Indian Standard Time rather than a manually entered time or an arbitrary server located elsewhere.

ETV Bharat: If someone becomes a victim of cyber fraud, how can the correct IST timestamp be established? Can it be checked through a wristwatch or phone?

Dr Poonam Arora: A wristwatch cannot establish whether a digital system was traceable to IST. For digital systems, traceability would have to come through services such as NTP or another authorised time-dissemination mechanism. NPL is also developing an application through which users may eventually be able to see Indian Standard Time directly on a smartphone, but that application is still under development.

ETV Bharat : What, in your opinion, is the larger significance of this move?

Dr Poonam Arora: It is an important initiative because it can strengthen the country's digital and cybersecurity infrastructure. Instead of relying on arbitrary time sources available over the internet, including servers located outside India, institutions will increasingly be able to rely on the country's own national reference time.

It should also create greater awareness of why accurate time synchronisation matters and why systems need timestamps that are traceable to an authenticated standard. Giving legal status to Indian Standard Time is therefore an important step in strengthening India's national timing infrastructure. It is also important to recognise that this has been a collective effort. NPL has worked with the Ministry of Consumer Affairs, Legal Metrology, ISRO and several other teams and institutions in developing the system.

ETV Bharat: Recommendations to strengthen India's timekeeping and dissemination infrastructure had been made earlier. Why has it taken time to reach this stage?

Dr Poonam Arora: Before you make something mandatory, you first have to strengthen the system that is going to provide that service. The first priority was therefore to strengthen the national source itself and then ensure that standard time could be made available through multiple channels. If a service is going to become mandatory, it has to be easily accessible.

That required the creation of redundant time-dissemination systems. Secondary atomic timescales have now been established at five regional centres, so time does not have to be disseminated only from NPL. These centres remain traceable to Indian Standard Time maintained at National Physical Laboratory (NPL). This infrastructure had to be developed before moving towards a legal framework.

ETV Bharat : What role will the Regional Reference Standard Laboratories play?

Dr Poonam Arora: The Regional Reference Standard Laboratories, or RRSLs, come under the Department of Consumer Affairs and Legal Metrology. NPL is the standards institution—we maintain the national reference. Legal Metrology, on the other hand has an enforcement role. Secondary atomic timescales have been established at the regional laboratories and these are traceable to the Indian Standard Time maintained at NPL. This creates additional regional points from which traceable time can be disseminated. These centers are Ahmedabad, Bengaluru, Faridabad, Bhubaneswar and Guwahati.

ETV Bharat: Why is a legally traceable national time reference particularly important for banking, telecom, transport, online payments and other critical systems?

Dr Poonam Arora: Different sectors require different levels of time accuracy. ISRO has very high precision requirements because of its satellite operations, so the required accuracy may be at the nanosecond level and appropriate satellite links are used for them. Banks on the other hand, may be adequately served with millisecond level accuracy.

Many banks already use NPL's Network Time Protocol (NTP) service, which is freely available. Currently some of the banks are taking this some are not but once the rules come into force, organisations covered by them will have to obtain time from authorised sources specified under the framework. The important point is that their timestamps will then be linked to one national reference.

ETV Bharat: How does having a common reference prevent disputes or manipulation of timestamps?

Dr Poonam Arora: Consider a hypothetical example involving an online ticket-booking system such as Tatkal. A passenger may say that they logged in exactly when booking opened but the tickets were already gone. If the server time itself could be altered, there could be a dispute over when the system actually opened. But if the server is required to remain synchronised with a legally recognised national reference, tempering or manipulation of the system clock becomes much more difficult and the timestamp becomes verifiable.

The same principle applies to banking, trading and other digital transactions. What becomes important is that everyone is working from an authenticated and traceable time reference.

ETV Bharat: What does this change mean for an ordinary citizen? Will people have to do anything differently?

Dr Poonam Arora: For most people, nothing changes in their day to day life. A mobile phone normally obtains its time through the telecom network. If telecom service providers synchronise their systems with IST users will automatically receive the correct time on their phones. People using laptops, PCs or desktops can also synchronise their systems with the NPL NTP service if they want their system time to be traceable to IST.

Ordinary citizens are unlikely to need this on a daily basis but if there is a cyber fraud or a dispute involving the timing of a digital transaction and having an accurately synchronised system can provide a more reliable timestamp for investigation.

ETV Bharat: So legal IST will not require people to change their clocks or watches?

Dr Poonam Arora: No. Manual watches and clocks will still have to be adjusted by individuals in the usual way. The legal framework is primarily about digital systems and the traceability of their timestamps. It is not about asking every individual to prove that their wristwatch is synchronised with IST.

ETV Bharat: You mentioned different technologies depending on the accuracy required. How does that work?

Dr Poonam Arora: Time can be disseminated using different technologies depends on the application. For many users including much of the banking sector, NTP over the internet may provide sufficient accuracy. Some strategic sectors may require significantly greater precision or may not want to depend on the public internet or satellite signals.

Satellite signals for example, may potentially be vulnerable to interference or jamming in certain situations. For such applications time can be distributed over terrestrial optical fiber links. One technology used for this is White Rabbit which is an advanced form of the Precision Time Protocol.

ETV Bharat: What was demonstrated using White Rabbit technology?

Dr Poonam Arora: A demonstration was carried out using an optical fiber link from the RRSL in Bengaluru where a timescale has been established. The purpose was to demonstrate that highly accurate time could be transferred over optical fiber using White Rabbit technology.

This was a technology demonstration rather than a nationwide deployment. Connecting the entire country through dedicated optical-fibre timing links would require considerable infrastructure and would take time. Initially such technology is more relevant for critical sectors requiring very high accuracy for example, stock exchanges or strategic installations.

ETV Bharat: Has such a system introduced for the National Stock Exchange?

Dr Poonam Arora: A demonstration has been completed at NSE. A permanent operational arrangement would require the necessary procurement, equipment and other formalities and time as well. The White Rabbit modules themselves are commercially available. NPL's role as the National Metrology Institute is to ensure that the system is correctly transferring time and that the accuracy measured at the receiving end is traceable to the national standard. The enforcement authorities would ultimately have to verify whether organisations are meeting the required accuracy.

ETV Bharat: During the 180-day transition period, what will businesses and institutions need to do? Will they need new equipment?

Dr Poonam Arora: Most users will not need new equipment. If millisecond-level accuracy is sufficient, services such as NTP can be used through existing systems. Specialised equipment becomes necessary only where much greater precision is required. A sector requiring microsecond or nanosecond-level accuracy may need a dedicated optical fibre connection, White Rabbit equipment or a satellite-based system. Such requirements would apply to a relatively small number of strategic or critical applications rather than every business.

ETV Bharat: Could the new framework add compliance costs for businesses?

Dr Poonam Arora: For organisations whose requirements can be met through the existing NTP service, the immediate cost should be limited because the service is currently freely available. However the enforcement agencies will have to develop their own mechanisms for checking compliance and auditing systems. At this stage it is difficult to say whether there could eventually be registration requirements, service fees or other charges. The rules provide room for such arrangements but the details will become clearer as implementation progresses.

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