Three Votes on Time

The 28th General Conference on Weights and Measures meets at Versailles on 13–15 October 2026. Three of the resolutions before it concern time.

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A reference brief on Draft Resolutions B, C and D, prepared from the primary documents.

What this brief examines

This brief works from the draft resolutions of the 28th General Conference on Weights and Measures as published by the BIPM — Version 5, dated 13 July 2026 — together with the version history of the drafting process, the consultative committee reports accompanying the drafts, and the 2022 resolutions they supersede. It reads those documents rather than coverage of them, and identifies where the two diverge.

Three of the resolutions before the Conference concern time: Draft Resolutions B, C and D. The Conference meets at the Palais des Congrès de Versailles from 13 to 15 October 2026.

Draft Resolution C — Continuous UTC

What it does

Draft Resolution C decides that **continuous UTC will become effective on 20 May 2027**, and that the maximum permitted value of the difference |UT1−UTC| will be **3,600 seconds — one hour** — a tolerance the resolution states will ensure "the long-term continuity for UTC for several centuries."

In plain terms: after 20 May 2027, no further leap seconds are inserted. Civil time is permitted to drift away from the Earth's rotation, and no correction is contemplated until that drift approaches an hour, which on current models will not occur for several hundred years.

The date moved forward by eight years, and the record of it is one line

CGPM Resolution 4 (2022) did not abolish the leap second. It decided that the maximum value of UT1−UTC "will be increased in, or before, 2035," and asked the International Committee for Weights and Measures to propose a new value and draft a resolution for the 28th CGPM. The widely reported figure from that decision was **2035**.

The version history of the 2026 draft resolutions document records what happened next:

> Version 1, 2026/01/13 — Publication of Draft Resolutions. **Version 2, 2026/01/30 — Draft Resolution C: effective date of continuous UTC set on 20 May 2027.**

The timetable advanced by eight years, and the change is documented in a single row of a version table.

Why it moved: the negative leap second

Every leap second inserted since the practice began in 1972 has been positive — a second added. A **negative** leap second, in which a second is removed, has never been applied anywhere.

The Earth's rotation has been speeding up. The BIPM and the International Earth Rotation and Reference Systems Service convened the world's experts on Earth rotation in 2025. Three independent research teams built stochastic models of length-of-day variation, validated them against centuries of rotation measurements, and reached what the CCTF report describes as "very similar results":

> ~30% probability of a negative leap second in the next 10 years, together with a ~50% probability of a positive leap second.

The response from industry is the part that has gone unreported. The ITU Telecommunication Standardization Sector warned that legacy systems would not handle negative leap seconds properly. The IEEE 1588 Precision Time Protocol working group — the body governing sub-microsecond synchronization for telecommunications, finance and power grids — emphasized that telecom applications require a continuous time scale, and raised the prospect of substantial investment to protect critical infrastructure.

The CCTF report records the conclusion directly:

> Industries stated that preparing for a negative leap second could be as demanding as preparation for the millennium Y2K bug.

That is the reason the schedule moved. Not elegance, and not astronomy. A one-in-three chance within a decade of an event that no deployed system has ever handled, in infrastructure that cannot tolerate it.

Why one hour

Three tolerance options were analyzed:

Option	Continuity provided	Outcome
1 minute	~one century	Not selected
1 hour	About a millennium	**Selected**

No fixed limit	Indefinite	Rejected

The report's option analysis gives the one-hour tolerance continuity "for about a millennium"; its final proposal, and Draft Resolution C itself, say "for several centuries."

"No limit" was rejected for a practical reason: systems that broadcast UT1−UTC requested a known limit, because a fixed bit allocation in the dissemination format requires a bounded value. Stakeholders consulted expressed a preference to minimize future adjustments to UTC, "possibly never again."

The justification for accepting an hour of divergence between civil and solar time is quietly notable. Time zones already impose offsets of up to three hours against local solar time, and daylight saving introduces a one-hour discontinuity twice a year in much of the world. A drift that accumulates to an hour over several centuries is, by that standard, socially invisible.

Draft Resolution B — The redefinition of the second

What it does

Draft Resolution B does **not** propose a new definition of the second. It asks the CIPM to continue the necessary work so that a proposal can be presented at the 29th CGPM in 2030, together with a proposal for the date of implementation.

The second has been defined since 1967 by a transition in caesium-133. Optical clocks now outperform caesium by two orders of magnitude, and the metrology community has been working toward a definition based on an optical transition. CGPM Resolution 5 (2022) set 2030 as the target for adoption.

The part nobody has reported: it is not going smoothly

Popular coverage of the redefinition has been uniformly triumphant — a march toward a better second. The draft resolution's own text is markedly more candid. Among the matters it records under "considering":

- **a consensus has not been reached** on whether to base the definition on a single species or an ensemble of species, nor on the preferred species for each option, despite active scientific debate;
- there are **noticeable inconsistencies** in some comparisons of optical frequency standards and in the global set of frequency ratio measurements involving optical frequency standards;
- **some of the mandatory criteria are not yet fulfilled** — for example, the contribution of optical frequency standards to the calibration of International Atomic Time.

The second of those is the substantive finding. The world's most accurate clocks do not fully agree with one another, and the body responsible for the definition of the second has said so in a document going to a vote.

The resolution nonetheless records that the criteria not yet met "could realistically be fulfilled by 2030 through international coordinated efforts supported by the CCTF."

Why this matters beyond metrology

A definition of the second based on a transition that other national laboratories cannot independently reproduce to the claimed accuracy would be a definition in name only. The redefinition is therefore gated not on building a better clock — that has been done — but on establishing that the best clocks agree. That is a harder problem, it is unresolved, and it is documented in the primary text rather than in any press account.

Draft Resolution D — Lunar time

What the press reported, and what is actually happening

In April 2024 the US Office of Science and Technology Policy directed NASA to deliver a standard for celestial time in cislunar space. The coverage that followed — across major international outlets — described the Moon receiving a time zone, generally named **LTC, Coordinated Lunar Time**, by analogy with UTC.

That is not what the institutions have built.

At its XXXII General Assembly in 2024, the International Astronomical Union defined the **Lunar Celestial Reference System**, with **Lunar Coordinate Time (TCL)**, together with the relativistic transformations from Barycentric Coordinate Time.

Draft Resolution D records that "thorough studies have shown that TCL without any scaling would meet the scientific requirements for a lunar reference time scale," and warns that a proliferation of reference time scales risks ambiguity when exchanging time-tagged data and must be avoided.

The document's version history shows the point being sharpened:

> Version 4, 2026/06/30 — Draft Resolution D: "the realization of lunar reference time scales" replaced by "the realizations of the lunar reference time scale" in the "further recommends" section, to reflect the aim of the draft resolution to state that there must be a unique lunar reference time scale, even if there may be several realizations

The plural was moved from the time scales to their realizations. There is to be one scale.

The physics

A clock near the lunar equator runs fast relative to one near the Earth's equator by approximately **56 microseconds per day**, from the combined effects of the difference in gravitational potential and relative motion. Over a single day that is enough to introduce kilometre-scale errors in ranging and navigation, which is why the matter cannot be deferred.

A different figure, near 58.7 μs/day, appears in the literature for certain scaled timescale conventions. The two are not interchangeable; they reflect different definitional choices, and conflating them is a common error.

The resolution also notes that direct use of UTC on the Moon would greatly complicate applications, because of the general relativistic effects involved.

An outstanding deadline

The 2024 OSTP policy directed NASA, coordinating with the Departments of Commerce, Defense, State and Transportation, to deliver a finalized lunar time standardization strategy by **31 December 2026**. As of this writing that deliverable has not been published.

What the existing coverage gets wrong

Claim in circulation	Status
Leap seconds end "by 2035"	Superseded. Draft Resolution C sets 20 May 2027.
The change is about astronomical elegance	The driver is a ~30% ten-year probability of a negative leap second, described by industry as a Y2K-scale preparation.
The redefinition of the second is on track	The draft resolution records no consensus on the species, noticeable inconsistencies between optical standards, and unmet mandatory criteria.
The Moon is getting a time zone called LTC	The IAU defined Lunar Coordinate Time (TCL) in 2024. Draft Resolution D warns against a proliferation of scales.
Lunar clocks gain 58.7 μs/day	56.02 μs/day for a clock near the lunar equator relative to one near Earth's equator. The other figure reflects a different convention.

The most widely circulated recent account of Resolution C, published in July 2026, states neither the 20 May 2027 effective date nor the 3,600-second tolerance — the two numbers that determine what the resolution actually does.

What to watch

13–15 October 2026. Whether Draft Resolutions B, C and D are adopted as drafted, amended, or deferred. Resolutions at the CGPM are normally adopted substantially as drafted, having been negotiated in advance through the Consultative Committees; amendment at the Conference itself would be the notable outcome.

Between adoption and 20 May 2027. Roughly seven months for implementers. The populations affected are those that encode UT1−UTC in a fixed field: GNSS broadcast messages, time dissemination services, PTP and NTP infrastructure, and any system that assumes UTC steps.

Terrestrial time signal broadcasters. A 2025 CCTF survey found five countries still broadcasting UT1−UTC terrestrially: Argentina, Canada, Russia, the United Kingdom and the United States. ITU Resolution 655 (Rev. WRC-23) permits the legacy code until 2035, and no later than 2040.

31 December 2026. The NASA lunar timing strategy deliverable.

2030. The 29th CGPM, at which a proposed definition of the second is due — if the consensus problem recorded in Draft Resolution B is resolved by then.

Sources

All statements above are drawn from the following primary documents.

- **28th CGPM meeting**, dates and venue — International Bureau of Weights and Measures: https://www.bipm.org/en/cgpm-2026
- **Draft Resolutions of the 28th CGPM**, Version 5 (13 July 2026), including the version history and the texts of Draft Resolutions B, C and D: https://www.bipm.org/documents/20126/284836054/CGPM-2026-Draft-Resolutions.pdf
- **CCTF report on Draft Resolution C** (July 2026), including the leap second probability modeling, the industry statements and the tolerance analysis: https://www.bipm.org/documents/20126/284836054/CCTF-report-on-Draft-Resolution-C.pdf
- **CGPM Resolution 4 (2022)**, on the use of and future development of UTC: https://www.bipm.org/en/cgpm-2022/resolution-4

- **BIPM, on the redefinition of the second** — background and the mandatory criteria: https://www.bipm.org/en/redefinition-second
- **OSTP, "Celestial Time Standardization in Cislunar Space"** (2 April 2024): https://bidenwhitehouse.archives.gov/wp-content/uploads/2024/04/Celestial-Time-Standardization-Policy.pdf
- **Ashby & Patla, "A Relativistic Framework to Establish Coordinate Time on the Moon"**, on the 56.02 μs/day figure: https://arxiv.org/abs/2402.11150
- **Bourgoin, Defraigne & Meynadier, "Lunar Reference Timescale"**: https://arxiv.org/abs/2507.21597
- **Defraigne, Meynadier & Bourgoin, "Lunar Time"** (November 2025), on the TCL trade-off analysis: https://arxiv.org/abs/2511.02709

Quotations from Draft Resolutions B, C and D and from the CCTF report are taken from the documents linked above as published at the date of this brief. Draft resolutions are subject to amendment before and during the Conference; the texts adopted on 13–15 October 2026 will govern.

This brief

Version 1.1, corrected 26 September 2026. First published 20 September 2026 as Version 1.0. When this brief is corrected, the version number is incremented, a dated note is added here, and the change is listed at sothic.org/corrections. Nothing is amended silently.

Correction note, 26 September 2026. Version 1.1 makes these corrections:

- The Draft Resolution B passage was quoted in words translated from the official French text, not in the published English. It now quotes the English: "could realistically be fulfilled by 2030 through international coordinated efforts supported by the CCTF."
- The Version 4 entry of the draft resolutions' version history was shown as a quotation but paraphrased. It is now quoted word for word.
- The summary of Draft Resolution B's "considering" list now follows the text: "a consensus has not been reached", and the inconsistencies are in measurements "involving" optical frequency standards.
- The tolerance table gave the one-hour option's continuity as "several centuries". The CCTF report's option analysis says "about a millennium"; a note now records both figures.

Zenodo Version 1.0.1 (24 September 2026) replaced only the PDF's document properties; its text is identical to Version 1.0.

How to cite

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