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|  | ASIA-PACIFIC TELECOMMUNITY | Document No: |
| **The 6th Meeting of the APT Conference Preparatory****Group for WRC-23 (APG23-6)** | **APG23-6/OUT-34** |
| 14 – 19 August 2023, Brisbane, Australia | 18 August 2023 |

Working Party 3

**APT VIEW and Preliminary APT Common Proposal on Resolution 655 (WRC-15)**

**Resolution 655 (WRC-15):**

*Definition of time scale and dissemination of time signals via radiocommunication systems*

**1. Background**

Coordinated Universal Time (UTC) is the international standard time scale for all practical timekeeping in the modern world. It is maintained by the International Bureau of Weights and Measures (BIPM) and adjusted by insertion or deletion of seconds (positive or negative leap-seconds) to ensure approximate agreement with mean solar time (UT1). A leap second was added most recently on 31 December 2016 at 23:59:60 UTC.

WRC-15 considered “Future of the Coordinated Universal Time time-scale” under AI 1.14, including removal of the leap second insertion or deletion from the definition of UTC, and decided that further studies were required on current and potential future reference time scales, including their impact and applications. The results of the ITU-R studies will be reported to WRC-23. Until then, UTC shall continue to be applied as described in Recommendation ITU-R [TF.460-6](https://www.itu.int/rec/R-REC-TF.460/recommendation.asp?lang=en&parent=R-REC-TF.460-6-200202-I) and as maintained by BIPM.

Since WRC-15, this issue has been studied by the ITU-R and the organizations of the Metre Convention in parallel and in cooperation with each other as per Resolution **655 (WRC-15)**.

The responsible group in ITU-R is WP 7A. In response to Resolution **655 (WRC-15)**, WP 7A developed Report ITU-R TF.[2511-0](https://www.itu.int/pub/R-REP-TF.2511). WP 7A also developed two Notes to provide the necessary information to the Director of the Radiocommunication Bureau (BR) for his report (Annex 4 Doc. [7A/64](https://www.itu.int/md/R19-WP7A-C-0064/en) and Annex 1 to Doc.[7A/76](https://www.itu.int/md/R19-WP7A-C-0076/en)).

In the meantime, the General Conference on Weights and Measures (CGPM) at its 26th meeting in 2018 confirms the definition of UTC in [Resolution 2](https://www.bipm.org/en/committees/cg/cgpm/26-2018/resolution-2) “On the definition of time scales”: that UTC is a time scale produced by the BIPM with the same rate as TAI (International Atomic Time) but differing from TAI only by an integral number of seconds.

The [27th CGPM](https://www.bipm.org/en/cgpm-2022) in November 2022 adopted [Resolution 4](https://www.bipm.org/en/cgpm-2022/resolution-4) on the use and future development of UTC and decided that the maximum value of the difference (UT1 – UTC) was going to be increased in, or before, 2035, which is currently 0.9 seconds, to be able to ensure the continuity of UTC for at least a century.

These activities under the Metre Convention are well recognized by WP 7A and reflected in the new Report ITU-R TF.2511-0 as well as the Notes to the BR Director.

**2. Documents**

* Input Documents APG23-6/INP-[37](https://www.apt.int/sites/default/files/2023/08/APG23-6-INP-37_Japan_WP3_PACP_WRC-23_Res_655.docx) (J), [82](https://www.apt.int/sites/default/files/2023/08/APG23-6-INP-82_Australia_WP3_PACP_WRC-23_Agenda_Items_and_Res.655_WRC-15.docx) (AUS), [111](https://www.apt.int/sites/default/files/2023/08/APG23-6-INP-111_Malaysia_WP3_PACP_WRC-23_Agenda_Items.docx) (MLA)
* Information Documents APG23-6/INF-[01](https://www.apt.int/sites/default/files/2023/06/APG23-6-INF-01_ITU_BR-WRC_agenda_items_4_6_9.1_10.docx) (BR), [23](https://www.apt.int/sites/default/files/2023/07/APG23-6-INF-23_Brief_on_AI_Res655.docx) (DG, Chair), [45](https://www.apt.int/sites/default/files/2023/08/APG23-6-INF-45_Status_of_RCC_preparation_to_WRC-23.pdf) (RCC), [46](https://www.apt.int/sites/default/files/2023/08/APG23-6-INF-46_Status_of_CEPT_preparation_for_WRC-23_and_RA-23.pdf) (CEPT), [52](https://www.apt.int/sites/default/files/2023/08/APG23-6-INF-52_CITEL_preparation_for_WRC-23.pdf) (CITEL)

**3. Summary of discussions**

**3.1 Summary of APT Members’ views**

**3.1.1 Japan** - **Document APG23-6/INP-**[**37**](https://www.apt.int/sites/default/files/2023/08/APG23-6-INP-37_Japan_WP3_PACP_WRC-23_Res_655.docx)

The 27th meeting of the General Conference on Weights and Measures (CGPM, November 2022) adopted Resolution 4 on the use and future development of Coordinated Universal Time (UTC) and decided to increase the maximum value for the difference (UT1 – UTC) by, or before, 2035. This decision has led to the substantial stoppage of leap second adjustment and moved to the continuous reference time scale after a certain transitional period.

Japan is of the view that the WRC-23 should amend Resolution **655** **(WRC-15)** and invite the ITU-R to revise Recommendation ITU-R TF.460-6, following this CGPM decision. In addition, Japan is of the view that the increase of the maximum value should be implemented as early as possible after a certain transitional period, recognising that the specific implementation timeframe, i.e. when to increase before 2035, will be considered by the International Committee of Weights and Measures (CIPM) in consultation with the ITU.

Taking into consideration that the ITU-R and CGPM will cooperate for the implementation of CGPM (2022) Resolution 4, Japan proposes updating APT views as follows:

APT Members support the ITU-R studies conducted under Resolution **655 (WRC-15)**, recognizing that the 27th General Conference on Weights and Measures (CGPM) in November 2022 adopted Resolution 4 and decided that the maximum value for the difference (UT1 – UTC) would be increased. APT Members would like to end leap seconds. APT Members also support the continuation of the ITU-R studies to cooperate further with the International Bureau of Weights and Measures (BIPM), the International Committee of Weights and Measures (CIPM) and CGPM on the future of UTC.

**3.1.2 Australia** - **Document APG23-6/INP-**[**82**](https://www.apt.int/sites/default/files/2023/08/APG23-6-INP-82_Australia_WP3_PACP_WRC-23_Agenda_Items_and_Res.655_WRC-15.docx)

Australia recognises the responsibility of the International Bureau of Weights and Measures (BIPM) in the maintenance of a global time scale and believes that the responsibility of the ITU-R is limited to the spectrum allocation for radiocommunication systems which disseminate the time signal, and the associated ITU Recommendation(s). Resolution **655 (WRC-15)** does not call for a decision by WRC-23 on the future of the leap second.

Australia is not proposing a Preliminary APT Common Proposal on this issue.

**3.1.3 Malaysia** - **Document APG23-6/INP-**[**111**](https://www.apt.int/sites/default/files/2023/08/APG23-6-INP-111_Malaysia_WP3_PACP_WRC-23_Agenda_Items.docx)

Malaysia supports the ITU-R studies called for by Resolution **655 (WRC-15)**, recognizing that the 27th General Conference on Weights and Measures (CGPM) in November 2022 adopted Resolution 4 and decided that the maximum value for the difference (UT1 – UTC) would be increased.

Malaysia is of the view that modification to Resolution **655 (WRC-15)** is necessary to reflect the decision made by CGPM.

**3.2 Summary of issues raised during the meeting**

During the Drafting Group, the point of the transition period was raised and considered. To reflect the discussion, some amendment was made to the PACP for modification of Resolution **655 (WRC-15)**.

**4. APT View(s)**

*The APT has considered Resolution 655 (WRC-15) and drafted a Preliminary APT Common Proposal on the matter. In addition, the APT has formed the following view(s) on the issue.*

APT Members support the ITU-R studies conducted under Resolution **655 (WRC-15)**, recognizing that the 27th General Conference on Weights and Measures (CGPM) in November 2022 adopted Resolution 4 and decided that the maximum value for the difference (UT1 – UTC) would be increased. APT Members are of the view that modification to Resolution **655 (WRC-15)** is necessary to reflect the decision made by CGPM.

APT Members also recognize the responsibility of the International Bureau of Weights and Measures (BIPM) for the maintenance of a global time scale and believes that the responsibility of the ITU-R includes the spectrum allocation for radiocommunication time signal dissemination and the associated ITU Recommendation(s) for their dissemination.

APT Members support the continuation of the ITU-R studies to cooperate further with the BIPM, the International Committee of Weights and Measures (CIPM) and CGPM on the future of UTC.

APT Members would like to end leap seconds.

**5. Preliminary APT Common Proposal**



**6. Issues for Consideration at APG Coordination Meeting at WRC-23 (if any)**

None

**7. Views from Other Organisations** (as provided in the information documents to

APG23-6)

**7.1 Regional Groups**

**7.1.1 ASMG** - **Document APG23-4/INF-**[**21**](https://www.apt.int/sites/default/files/2022/08/APG23-4-INF-21_ASMG_Preparation_for_WRC-23.pdf)

No views provided

**7.1.2 ATU** - **Document APG24-4/INF-**[**02**](https://www.apt.int/sites/default/files/2022/07/APG23-4-INF-02_ATU_preparation.docx)

No views provided

**7.1.3 CEPT** - **Document APG23-6/INF-**[**46**](https://www.apt.int/sites/default/files/2023/08/APG23-6-INF-46_Status_of_CEPT_preparation_for_WRC-23_and_RA-23.pdf)

CEPT recognises that:

* the general definition of the international reference time scale UTC is provided in Resolution 2 (2018) of the 26th General Conference on Weights and Measures (CGPM), whereas Resolution 4 (2022) of the 27th CGPM determines its future relation with respect to mean solar time UT1;
* UTC is produced by BIPM and its definition is not a task of spectrum regulation; and
* the cooperation between BIPM and the ITU-R is settled by their Memorandum of Understanding, signed in 2020.

CEPT will address necessary revisions and amendments regarding Resolution **655 (WRC-15)**.

**7.1.4 CITEL** - **Document APG23-6/INF-**[**52**](https://www.apt.int/sites/default/files/2023/08/APG23-6-INF-52_CITEL_preparation_for_WRC-23.pdf)

Preliminary Proposals (PP)

**MOD** Resolution **655 (Rev. WRC-15)** **“Definition of time scale and dissemination of time signals via radiocommunication systems”**: One Administration proposes changes to this Resolution to reflect the completion of the work items as well as to acknowledge the ongoing cooperation between the ITU and other relevant organizations in the various aspects of current and potential future reference time scales and the role of the ITU-R in the dissemination of the international reference time scale by radiocommunication.

**7.1.5 RCC** - **Document APG23-6/INF-**[**45**](https://www.apt.int/sites/default/files/2023/08/APG23-6-INF-45_Status_of_RCC_preparation_to_WRC-23.pdf)

The RCC Administrations are of the view that, changes of the UTC scale may lead to the need to modify on-board equipment of GNSS, ground stations of the standard frequency and time signal service, transmitting reference signals of frequency and time, as well as navigation and frequency-time consumer equipment. Transition date to a continuous time scale should be within the competence of the ITU as the date defines by the technical capabilities of the systems of various radiocommunication services (space and terrestrial).

In the case to switch to a new time scale, it is necessary:

* + to retain the term “UTC”, while proposing to revise the limits on the maximum discrepancy between UT1 and UTC times, to meet the needs of current and future user communities;
	+ to determine, before WRC-27, the maximum value of the discrepancy between the UT1 and UTC times not less than 100 s;
	+ to establish a transition period, the duration of which should take into account the planned lifetime of the equipment, and ensure the principle of backward compatibility for consumers of all categories.

Transition period to continuous time scale should be established from the moment of taking decision into force, but not early than in 2040.

**7.2 International Organisations**

None

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