RESOLUTION 675 (WRC-23)

Importance of meteorological aids service (space weather) applications

The World Radiocommunication Conference (Dubai, 2023),

considering

a) that the collection and exchange of space weather data are important for detecting solar activity events, including solar flares and high energetic particles and their relevant consequences for the Earth's geomagnetic and ionospheric conditions, and other space weather phenomena that impact services critical to the economy, safety and security of administrations and the populations of their countries;

b) that space weather data is critical for forecasting and providing alerts of space weather events and important to understanding the physical processes to develop prediction models for space weather events and their impacts on societal-infrastructure services;

c) that space weather data is important in understanding the physical process to provide prediction models for space weather events and their impacts;

d) that spectrum-reliant space weather sensor technology has been developed and operational systems have been deployed without much regard for domestic or international spectrum regulations, or for the potential need for protection from interference;

e) that spectrum-reliant space weather sensors may be vulnerable to interference from both terrestrial and spaceborne systems;

f) that some space weather sensors operate by receiving signals of low-level natural phenomena, mainly originating from solar activity and occurring beyond the major portion of the Earth's atmosphere, that impact the Earth's environment, and that they may therefore suffer harmful interference at levels which could be tolerated by other radiocommunication applications;

g) that the importance of space weather radiocommunication applications has been stressed by a number of international bodies, such as the World Meteorological Organization, the Intergovernmental Panel on Climate Change, the United Nations Office for Disaster Risk Reduction (UNDRR), the International Civil Aviation Organization (ICAO) and the United Nations Committee on the Peaceful Uses of Outer Space, and that ITU Radiocommunication Sector (ITU-R) collaboration with these bodies is essential;

h) that space weather data collection is performed for the benefit of the whole international community and the data is generally made freely available to users,

recalling

a) the Plan of Action of the World Summit on the Information Society (Geneva, 2003), on e-environment, calling for the establishment of monitoring systems, using information and communication technologies (ICTs), to forecast and monitor the impact of natural and man-made disasters, particularly in developing countries, least developed countries and small economies;

b) Resolution 136 (Rev. Bucharest, 2022) of the ITU Plenipotentiary Conference, on the use of telecommunications/ICTs for humanitarian assistance and for monitoring and management in emergency and disaster situations, including health-related emergencies, for early warning, prevention, mitigation and relief;

c) Resolution 182 (Rev. Bucharest, 2022) of the Plenipotentiary Conference, on the role of telecommunications/ICTs in regard to climate change and the protection of the environment;

d) the Global Framework for Climate Services as identified at the eighteenth session of the World Meteorological Congress (Geneva, June 2019), which provides information to help society adapt to climate variability and change;

e) that UNDRR and the International Science Council identified hazards related to space weather in the initial list of the hazards for disaster risk management in 2021 under the Sendai Framework for Disaster Risk Reduction 2015-2030;

f) United Nations General Assembly Resolution 76/3 of 25 October 2021, on the 'Space2030' Agenda: space as a driver of sustainable development, objective 3.8: increase awareness of the risks of adverse space weather and mitigate those risks, in order to ensure increased global resilience against space weather effects, and improve the international coordination of space weather-related activities, including outreach, communication and capacity-building, as well as the establishment of an international mechanism to promote increased high-level coordination in relation to space weather and increased global resilience against space weather effects;

g) Amendment 78 to Annex 3 to the Convention on International Civil Aviation (International Standards and Recommended Practices, Meteorological Service for International Air Navigation), adopted on 7 March 2018 at the 213th session of the ICAO Council, which has introduced space weather advisory information services on space weather phenomena expected to affect aeronautical radiocommunication and radionavigation systems,

recognizing

a) that Report ITU-R RS.2456, on space weather sensor systems using radio spectrum, contains:

– a summary of spectrum-reliant space weather sensors; and

– the documentation of the systems used for operational space weather monitoring, prediction and early warning deployed globally;

b) that the ITU-R *Handbook on Radio Astronomy* contains further information on space weather observations;

c) that existing services and their systems and applications should be protected in the frequency bands used for space weather observations and no undue constraints should be imposed on the future development of these services,

noting

a) that *in situ* (local) and remote-sensing space weather observation capabilities depend on the availability of radio frequencies;

b) that, according to the United Nations Office for Outer Space Affairs, society is becoming increasingly dependent on space-based systems and it is vital to understand how space weather could affect space systems and human space flight, electric power transmission, high-frequency radiocommunications, and global navigation satellite system (GNSS) signals;

c) that certain frequency bands used by space weather applications have unique physical characteristics, so that migration to alternative frequency bands is not possible;

d) the need to include within the agenda of a world radiocommunication conference (WRC) an item for studies to be conducted on compatibility and frequency sharing for space weather sensors with incumbent radiocommunication services and for possible allocations for the meteorological aids service (MetAids) (space weather), on the basis of the outcomes of ITU-R studies,

resolves

1 that the following definition for space weather shall be used:

space weather: natural phenomena, mainly originating from solar activity and occurring beyond the major portion of the Earth's atmosphere, that impact Earth's environment and human activities;

2 that space weather sensor systems may operate under MetAids (space weather) allocations;

3 that an active space weather sensor is a system in the MetAids (space weather) by means of which information is obtained by transmission and reception of radio waves;

4 that a receive-only space weather sensor is a system in the MetAids (space weather) by means of which information is obtained by reception of radio waves of natural origin, or by the opportunistic reception of transmissions of other specific radiocommunication services;

5 to recognize the importance of spectrum usage by space weather applications for monitoring space weather phenomena and events that impact services critical to the economy, safety and security of administrations and the populations of their countries;

6 to urge administrations to take into account space weather radio-frequency requirements and in particular protection of the related frequency bands;

7 to encourage administrations to consider the importance of the use and availability of spectrum for space weather applications prior to taking decisions that would negatively impact their operations;

8 that no notification of frequency assignments to a station used for space weather observation be made by administrations under the existing MetAids allocations until a future competent WRC introduces the corresponding allocations to MetAids (space weather) in Article **5**,

instructs the Director of the Radiocommunication Bureau

to consider any frequency assignments to space weather sensors that are notified within existing MetAids allocations prior to such a decision being taken by a competent WRC in accordance with *resolves* 8 above as being not in conformity with No. **11.31**.