QUESTION ITU-R 258/5[[1]](#footnote-1)

**Technical and operational principles for HF sky-wave communication stations to improve the man-made noise HF environment[[2]](#footnote-2)**

(2015)

The ITU Radiocommunication Assembly,

*considering*

*a)* environmental factors that impact ionospheric communication and the features of HF time varying channel parameters are fundamentally unchanging aspects of physics;

*b)* that in the framework of fixed frequency assignment and frequency-band allocation, non-cooperative frequency and power competition in shared frequency bands causes congestion of the HF frequency range, mutual interference, and low spectrum utility efficiency and have become prime reasons for the HF environment degradation;

*c)* that mutual interference in HF sky-wave propagation is difficult to mitigate by geographic isolation, it has global influences to HF communications;

*d)* that to overcome channel interference, users often increase emission power which results in overall higher background noise in the HF environment;

*e)* that the HF frequency spectrum resource is limited, while HF applications are extending and the number of licensed users are increasing with time;

*f)* that most existing HF communication technologies and new emerging cognitive radio technology cannot on their own offer an acceptable solution to the problem of HF environment degradation;

*g)* that there is a need for principles to be developed that would result in overall more efficient use of HF spectrum, requiring self-management principles such as minimizing emission power, the use of adaptive techniques for frequency selection, and the use of more efficient transmission modes (e.g., digital),

*recognizing*

*a)* that Resolution **729** **(Rev.WRC-07)** has specified use of frequency adaptive systems in the MF and HF bands;

*b)* that Article **12** has specified principle on use and coordination procedure of high frequency broadcasting, and Recommendation **522** **(WRC-97)** has specified coordination of HF broadcasting schedules;

*c)* that RR Nos. **5.143**, **5.143A**, **5.143B**, and **5.152** have limited emission power of fixed services in common frequency band of broadcasting or amateur service,

*noting*

*a)* that Recommendation ITU-R F.1611 has provided guidance on adaptive HF system planning and operation using prediction methods while addressing frequency planning, power budget, etc.;

*b)* that Recommendation ITU-R F.1110 has recommended to reduce the interference between users by reducing the communication period;

*c)* that ITU-R has developed a Handbook on frequency adaptive communications systems and networks in the MF/HF bands which describes the nature of adaptive HF systems and their use;

*d)* that Recommendation ITU-R SM.329, Recommendation ITU-R SM.1541 and Appendix **3** to Radio Regulations **(Rev.WRC-15)** have indicated the limits for unwanted emissions in the spurious domain and out-of-band domain for wireless equipment;

*e)* that Recommendation ITU-R P.372 provided information on the background levels of radio-frequency noise in the frequency range from 0.1 Hz to 100 GHz,

*decides* that the following Questions should be studied

1 What technical and operational principles can administrations implement to better manage the man-made noise HF environment and reduce the background noise in HF bands? Taking into account:

− techniques for evaluating the mutual interference in HF sky-wave communications and frequency sharing;

− technical measures and operational requirements for mitigating or avoiding mutual interference among HF sky-wave communication stations while frequency sharing;

− new HF frequency techniques used for both frequency cooperative and frequency sharing in different HF sky-wave communication systems;

− limiting requirements for unwanted emission power of HF systems;

− multilateral or regional coordination mechanisms for frequency sharing for HF sky‑wave communications,

2 What principles can be developed with the resulting aim of a reduction of overall man‑made noise in the HF frequency range?

*further decides*

1 that the results of the above studies should be included in new and/or revised Reports/Recommendations as appropriate;

2 that initial results of the above studies should be completed by 2027.

Category: S2

1. In the year 2023, Radiocommunication Study Group 5 extended the completion date of studies for this Question. [↑](#footnote-ref-1)
2. This Question should be brought to the attention of Study Groups 3 and 6. [↑](#footnote-ref-2)