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| **US Radiocommunication Sector****FACT SHEET** |
| **Study Group:** USWP 7B | **Document No:** US7B027\_020\_NC |
| **Reference:** Resolution **129 (WRC-23)** | **Date:** 06 May 2024 |
| **Document Title:** Proposed reply liaison statement to WP 4A concerning characteristics of SRS systems in the 13.75 – 14 GHz band for use in studies under WRC-27 agenda item 1.2 |
| **Authors**Richard TsengNASA Bashaer ZakiNASATed Berman, Peraton for NASAJames BrasePeraton for NASA | **Telephone**301-286-1826301-323-3627240-449-0884703-483-1575 | **E-Mail**richard.s.tseng@nasa.govbashaer.e.zaki@nasa.govtheodore.e.berman@nasa.govjames.m.brase@nasa.gov |
| **Purpose:** To provide characteristics of SRS systems in the 13.75 – 14.0 GHz band to WP 4A for use in studies under agenda item 1.2 **(WRC-27)**  |
| **Abstract:** RR **5.502** establishes constraints on the antenna sizes of FSS earth stations in the 13.75 – 14.0 GHz band. Geostationary FSS earth station antennas are limited to a minimum diameter of 1.2m whereas non-geostationary earth station antennas have a minimum diameter of 4.5m. The SRS is allocated on a secondary basis in the band; however, RR **5.503** indicates that geostationary SRS space stations for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the FSS. This includes certain geostationary data relay satellite (DRS) systems which operate forward intersatellite links in the band from a geosynchronous data relay satellite to a user satellite, typically in low Earth orbit. Agenda item 1.2 (**WRC-27**) calls for examination of possible revisions to the FSS earth station minimum antenna size constraints while ensuring the protection of the services stipulated in Nos. **5.502** and **5.503**. At its May 2024 meeting, WP 4A drafted a liaison statement to WP 7B (7B/46) requesting information on the technical characteristics, operational parameters and protection criteria of systems operating in this band for use in sharing studies under this agenda item. Recommendation ITU-R SA.1414 contains some information on RF characteristics and protection criteria of DRS systems operating intersatellite links in this band but does not include operational parameters or orbital characteristics of DRS users which dictate the pointing of the DRS antennas. This contribution includes a proposed reply liaison statement from WP 7B to WP 4A containing information on SRS systems in this band in addition to that included in Recommendation ITU-R SA,1414 for use in sharing studies under agenda item 1.2 (**WRC-27**). |
| **Fact Sheet Preparer:** James Brase, Peraton for NASA |

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| Draft Reply Liaison Statement to Working Party 4A  |
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WRC-27 agenda item 1.2 calls for the examination of possible revisions to the sharing conditions applicable to the FSS in the 13.75 – 14.0 GHz band while ensuring the protection of the other services allocated in the band. These conditions are stipulated in Nos. **5.502** and **5.503**, both established at WRC-03 and specifically address protection of systems in the radiolocation and space research services.

RR **5.502** establish constraints on the antenna sizes of FSS earth stations in the 13.75 – 14.0 GHz band. Geostationary FSS earth station antennas are limited to a minimum diameter of 1.2m whereas non-geostationary earth station antennas have a minimum diameter of 4.5m.

The SRS is allocated on a secondary basis in the band; however, RR **5.503** indicates that geostationary SRS space stations for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the FSS. This includes certain geostationary data relay satellite (DRS) systems which operate forward intersatellite links in the band from a geosynchronous data relay satellite to a user satellite, typically in low Earth orbit.

At its May 2024 meeting, WP 4A drafted a LS to WP 7B (7B/46) requesting information on the technical characteristics, operational parameters and protection criteria of SRS systems operating in this band for use in sharing studies under this agenda item. Recommendation ITU-R SA.1414 includes some information on RF characteristics and protection criteria of DRS systems operating intersatellite links in this band but does not include operational parameters or orbital characteristics of DRS users which dictate the pointing of the DRS antennas. This contribution proposes text for a WP 7B reply liaison statement to WP 4A containing the additional information on characteristics of SRS systems in this band needed for studies under agenda item 1.2 (**WRC-27**). In particular, relevant information for the United States’ Tracking and Data Relay Satellite (TDRS) system is provided.

**Attachment**

**Working Party 7B**

Draft Reply Liaison Statement to Working Party 4A

**Characteristics of Space Research Service Systems Operating in the 13.75 – 14.0 GHz band**

Working Party (WP) 7B thanks WP 4A for its liaison statement in Document 7B/46 requesting information on the characteristics of space research service (SRS) systems operating in the 13.75 – 14.0 GHz band for use in sharing studies under agenda item 1.2 (**WRC-27**). Table 2 of Annex 1 of Recommendation ITU-R SA.1414 provides the characteristics of forward inter-orbit links operated in this band by the United States’ Tracking and Data Relay Satellite (TDRS) system and by a separate DRS system operated by the Russian Federation. The Table is divided into two sections giving the parameters of both the transmitting geosynchronous data relay satellite and the receiving spacecraft, typically in low Earth orbit.

Additionally, Report ITU-R SA.2067 provides studies addressing sharing between fixed-satellite service systems and forward inter-orbit links of the TDRS system, and includes some additional information on the characteristics of both the TDRS system and a TDRS user satellite. The relevant characteristics are included in Table 1 below.

Additional detailed characteristics for the TDRS system are provided in Table 1 below to support studies in WP 4A under Agenda Item 1.2 **(WRC-27)**.

TABLE 1

 **Additional TDRS Forward Link Characteristics**

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| --- | --- | --- |
| **Parameter** | **Unit** | **Value** |
| Representative GSO DRS spacecraft orbital position | deg | 41oW, 46oW, 171oW, 174oW (see note 1) |
| DRS spacecraft transmit parameters |  | See Table 2 of Rec. ITU-R SA.1414 |
| DRS user satellite orbit altitude | km | 400 |
| DRS user satellite orbit inclination  | deg | 51.6 |
| DRS user satellite orbit eccentricity |  | 0.0 |
| DRS user antenna gain | dBi | 45.2 |
| DRS user system noise temperature  | K | 825 |
| DRS user passive losses | dB | -2.0 |
| Center frequency | GHz | 13.775 |
| DRS user receive bandwidth | MHz | 10.0 |
| DRS user antenna pattern |  | See Fig 3. of Report ITU-R SA.2067 |
| DRS-user link protection criteria |  | Rec. ITU-R SA.1155 |
| Note 1: Per RR **5.503** these geostationary SRS space stations for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service. |

WP 7B appreciates being kept informed of the status of all sharing studies relating to agenda item 1.2 (WRC-27).

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| **Status:** For information and action |
| **Deadline:** For next ITU-R 7B meeting (31 March 2025) |  |
| **Contact:**  TBD | **E-mail:** TBD |

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