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|  | Electronic Communications CommitteeWorking Group Spectrum Engineering | **Doc. SE(21)112R4** |

**Report from the 89th Meeting of**

**Working Group Spectrum Engineering**

**Hybrid meeting, Copenhagen/Remote,**

**27 September – 01 October 2021**

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# Opening of the meeting

The 89th meeting of WG SE was held both in presence and remotely, from the 27th of September to the 1st of October 2021, with the following principles decided in July 2021:

* “one delegate maximum per administration attending the face-to-face meeting,
* other delegates from administration could register to attend virtually,
* observers could register to attend virtually.

Note: PT Chairs could attend the meeting face to face independently.”

The Chairman of WG SE clearly stated that the hybrid meeting is an experimental format at this stage and all participants are invited to provide feedback by responding to the survey available on WG SE website before Wednesday, the 6th of October, following the proposal from Sweden.

The meeting started at 10:00 CEST on Monday, the 27th of September 2021.

General information about the meeting was provided on the CEPT website. Doc. [SE(21)INFO001R1](https://www.cept.org/ecc/groups/ecc/wg-se/client/meeting-documents/file-history/?fid=64965) provided instructions on how to participate in WG SE hybrid meeting and a dedicated presentation of the new meeting tool MeetingHub was available in Doc. [SE(21)INFO002](https://www.cept.org/Documents/wg-se/66265/se-21-info002_meetinghub-quickguide-10).

Observers (MoU/LoU or invited by the Chairman) were welcome, as remote participants, in order to provide technical assistance to the administrations as appropriate.

The WG SE Chairman thanked ECO for hosting this hybrid meeting, and for all the help in organising this meeting. Ninety nine participants were registered, including ten attending physically in the ECO facilities.

The WG SE Chairman informed the participants that three documents had to be considered for final approval, five documents had to be considered for public consultation, and two questionnaires. In addition to that, ongoing work on different topics needed to be reviewed. Thirty two input documents and three documents for information were discussed. The list of meeting participants can be found in [Annex 03](https://www.cept.org/Documents/wg-se/66640/se-21-112a03_list-of-participants).

# Adoptions of the Agenda, Schedule of Work

A draft agenda and provisional timetable are contained in the Documents [SE(21)080](https://www.cept.org/Documents/wg-se/66082/se-21-080_preliminary-draft-agenda-of-the-89th-wg-se-meeting) and [SE(21)081](https://www.cept.org/ecc/groups/ecc/wg-se/client/meeting-documents/file-history/?fid=66406), considering the last version on the website prevails.

# Chairmanships

ECO has provided an overview of chairmanships (Doc. [SE(21)083](https://www.cept.org/Documents/wg-se/66266/se-21-083_overview-of-chairmanships-within-ecc)).

In response to call for nomination in Doc. [SE(21)NOM001](https://www.cept.org/Documents/wg-se/64966/se-21-nom01_call-for-nomination-chairperson-of-se40), Ofcom UK nominated Dr. Jesús Arnau Yáñez to replace Dr. Marco Marcovina who stepped down as SE40 Chairman. The Chairman of WG SE thanked Dr. Marco Marcovina for his very good work as SE40 Chairman. Dr. Jesús Arnau Yáñez was invited to introduce himself and his experience in international meetings as detailed in his CV as contained in document [SE(21)NOM02](https://www.cept.org/Documents/wg-se/65936/se-21-nom02_uk-nomination-of-chairman-se40)).

WG SE appointed Dr. Jesús Arnau Yáñez by acclamation as Chairman for the SE40 PTs of WG SE.

Petteri Jokela informed that he will have to leave his position as SE7 Chairman after the finalization of the draft ECC Report on UAS expected to be finalised in January 2022.

The WG SE Chairman thanked Petteri for is outstanding support to ECC work by chairing during a long period this project team.

Petteri thanked all the attendees of his 123 SE7 meetings as Chairman and 50 WG SE and some other meetings in the 1990’s. He was not able to remember how many kilometers he ran because they were too many... All the participants had the pleasure to visit almost all the cities in Europe where meetings took place, by watching the pictures Petteri took during his runs.

# Matters arising from meetings of:

* 1. **WG FM**

The minutes of the 99th WG FM meeting that took place remotely from the 24th to 28th of May 2021 are available in Document [FM(21)102](https://www.cept.org/Documents/wg-fm/64976/fm-21-102_wg-fm-99-minutes).

Extract of elements relevant for WG SE from the WG FM minutes is provided in Document [SE(21)084](https://www.cept.org/Documents/wg-se/66123/se-21-084_extract-from-the-wg-fm-99-minutes). Elements highlighted in yellow have been identified of a particular interest for WG SE and in blue of the general interest for WG SE.

In response to the liaison statement from the 88th WG SE meeting, the WG FM provided guidance sought on the work items of WG SE in Doc. [SE(21)104](https://www.cept.org/Documents/wg-se/65689/se-21-104_ls-to-wg-se-on-guidance-sought-from-wg-fm).

* 1. **ECC PT1**

The minutes of the 68th ECC PT1 meeting that took place remotely from the 12th to 13th of April 2021 (Part 1) and from the 26th to 29th April 2021 (Part 2: WRC-23 issues) are available in Document [ECC PT1(21)150](https://www.cept.org/Documents/ecc-pt1/64919/ecc-pt1-21-150_minutes-of-68th-ecc-pt1-meeting).

Extract of elements relevant for WG SE from this ECC PT1 minutes is provided in Document [SE(21)085](https://www.cept.org/Documents/wg-se/66124/se-21-085_extract-from-minutes-of-68th-ecc-pt1-meeting). Elements highlighted in yellow have been identified of a particular interest for WG SE and in blue of the general interest for WG SE.

The 69th ECC PT1 meeting took place remotely from the 13th to the 17th of September 2021 but outcomes were not yet available.

* 1. **CPG23**

The minutes of the CPG23-3 meeting that took place remotely from the 18th to 21st of May 2021 are available in Document [CPG(21)019](https://www.cept.org/Documents/cpg/64833/cpg-21-019_minutes-of-cpg23-3).

Extract of elements relevant for WG SE from this CPG23 minutes is provided in Document [SE(21)086](https://www.cept.org/Documents/wg-se/66125/se-21-086_extract-from-the-minutes-of-cpg23-3). Elements highlighted in yellow have been identified of a particular interest for WG SE and in blue of the general interest for WG SE.

* 1. **ECC**

The minutes of the 56th ECC meeting that took place from the 28th June to 2nd of July are available in Document [ECC(21)057](https://www.cept.org/Documents/ecc/65437/ecc-21-057_minutes-of-the-56th-ecc-plenary-meeting).

Extract of elements relevant for WG SE from this ECC minutes is provided in Document [SE(21)087](https://www.cept.org/Documents/wg-se/66126/se-21-087_extract-from-the-minutes-of-the-56th-ecc-plenary-meeting). Elements highlighted in yellow have been identified of a particular interest for WG SE and in blue of the general interest for WG SE.

* 1. **ETSI**

A report of the relevant ETSI activities including the results of the ETSI ERM correspondence meetings is provided in Document [SE(21)088](https://www.cept.org/Documents/wg-se/66485/se-21-088_etsi_lo_report).

The WG SE was in copy of a liaison statement sent by ETSI TC ERM to the WG FM in Doc. [SE(21)107](https://www.cept.org/Documents/wg-se/66129/se-21-107_ls-etsi-tc-erm-to-wgfm-on-tr-103-774-srdoc-for-wpt-in-9173-9177-mhz) with the attached Document [SE(21)107A1](https://www.cept.org/Documents/wg-se/66130/se-21-107a1_draft-srdoc-for-wpt-in-9173-9177-mhz).

ETSI Liaison Officer presented the recent developments within ETSI.

# Documents for final approval after Public Consultation

The deliverables sent to public consultation by the 88th WG SE meeting and comments received during the consultation period of these documents were distributed by ECO (Doc. [SE(21)101](https://www.cept.org/Documents/wg-se/66105/se-21-101_outcome-of-the-pc-on-draft-ecc-report-326), [SE(21)102](https://www.cept.org/Documents/wg-se/66109/se-21-102_outcome-of-the-pc-on-draft-ecc-report-327) and [SE(21)103](https://www.cept.org/Documents/wg-se/66118/se-21-103_outcome-of-the-pc-on-partial-draft-ecc-report-322) with their corresponding annexes).

WG SE was to consider the received comments and updated ECC Report from relevant project teams as well as contributions where appropriate.

* 1. **ECC Report 326 (WI SE24\_61): Study on high power SRDs on the first RFID interrogator channel at 916.3 MHz of the frequency band 915-921 MHz**

ECC Report 326 deals with the conditions of implementation of NBN SRDs in the first RFID interrogator channel centred at 916.3 MHz of the frequency band 915-921 MHz.

The outcome of the public consultation is available in input Doc. [SE(21)101](https://www.cept.org/Documents/wg-se/66105/se-21-101_outcome-of-the-pc-on-draft-ecc-report-326) and associated annexes and proposed revised draft ECC Report 326 after review by SE24 of the received comments in Doc. [SE(21)092A01](https://www.cept.org/Documents/wg-se/66252/se-21-092a01_draft-ecc-report-326-after-comment-resolution).

All the comments were successfully resolved by SE24.

During the meeting, the proposal from Germany to copy existing part of the text from the main body and paste it into executive summary to recognise the use by some countries of the range 915-921 MHz for defence or governmental systems was agreed.

After having reviewed the input documents on this topic, WG SE finally approved the ECC Report 326 for publication as contained in [Annex 07](https://www.cept.org/Documents/wg-se/66590/se-21-112a07_ecc-report-326-study-on-high-power-srds-on-the-first-rfid-interrogator-channel-at-9163-mhz-of-the-frequency-band-915-921-mhz). The corresponding WI SE24\_61 was closed.

* 1. **ECC Report 327 (WI SE24\_63): Studies related to an update of UWB regulatory framework**

ECC Report 327 deals with studies in regards to the intended update of the existing UWB regulatory framework based on the SRdocs TR103 313 and TR 103 314 to answer the permanent EC mandate on UWB.

The outcome of the public consultation is available in input Doc. [SE(21)102](https://www.cept.org/Documents/wg-se/66109/se-21-102_outcome-of-the-pc-on-draft-ecc-report-327) and associated annexes and proposed revised draft ECC Report 327 after review by SE24 of the received comments in Doc. [SE(21)092A03](https://www.cept.org/Documents/wg-se/66297/se-21-092a03_draft-ecc-report-327-after-comment-resolution).

Some comments were not resolved after the last SE24 meeting. These unresolved issues were put in square brackets and submitted to WG SE to be resolved at higher level.

Several administrations made statement in the minutes of the SE24 meeting.

In Doc. [SE(21)109](https://www.cept.org/Documents/wg-se/66480/se-21-109_confirmation-of-pc-comment-on-draft-ecc-report-327-on-uwb-se24_63), France confirmed the comments made for the PC on the draft ECC Report 327 for its executive summary and conclusion in order to underline a proper care to be taken to maintain the balance achieved today with the existing UWB regulation framework in terms of coexistence with outdoor stations of radiocommunication services.

In Doc. [SE(21)110](https://www.cept.org/Documents/wg-se/66481/se-21-110_proposal-for-exec-summary-ecc-report-327), Germany proposed a text for section 0.6 of the executive summary that remains unresolved at SE24 level. The proposal aims first to spell out the type of applications that were studied, and second to describe the assumptions used in the studies.

Doc. [SE(21)111](https://www.cept.org/Documents/wg-se/66482/se-21-111_cover_page_ecc-report-327_-wi-se24_63docx) and the associated attachments, from Sweden, contains clarifications regarding the raised concerns are addressed in the attached extract from the draft ECC report 327. Additionally, a SEAMCAT workspace is attached that was used to cross validate the study, where comparable results were found.

Following the introduction of the contributions, it was discussed first on the relevancy to keep or not the additional technical study received during the public consultation from Ericsson as concerns were expressed by Germany about the methodology and some other topics. It was recognized that the contribution from Sweden aims to provide an answer to these concerns. A drafting group was created in which Germany introduced a list of their concerns and Sweden was tasked to provide a response, in order to allow the Plenary to take a decision on the appropriate way to deal with this study. The drafting group resolved the comments on the concerns and agreed to include the technical study with some additional explanations in the main body and in the executive summary.

A second drafting group was created to address the diverging views on parts of the executive summary.

First, the sections 0.1 “Overview” and 0.6 “ Overall considerations” were merged to restructure the executive summary and a delicate compromise was reached on the content of this section in particular on the deployment densities, mitigation techniques, and the caveat associated to the coexistence.

Secondly, in the section relative to the summary of the studies with the FS, the additional text proposed by Sweden during public consultation was not agreed. A delicate compromise was found on this complete section relative to the studies using Recommendations ITU-R P.452, P.2108 and P.2109 that combine space and time distributions to assess the transmission loss and calculate the interference after the following considerations:

* As in ECC Report 316, “the results are in terms of time-space percentage and not in terms of time percentage only. This needs to be taken into account in the interpretation of results”. Consequently, a proposal was made to only keep the same terminology as in the ECC Report 316 and remove any reference to the ongoing studies on the FS protection criteria within SE19, but this proposal was not agreed.
* Following the point raised in the first bullet, Sweden offered an alternative proposal that was agreed, apart from “the carried out Monte Carlo simulations assumed both mobile and fixed UWB devices to be mobile” to point out the location redistribution at each sample of the Monte Carlo simulation for fixed UWB stations. The rationale not to include the quoted text above, was that the main body already describes the used methodology in details.

WG SE reviewed the outcomes from the drafting groups, and agreed to finally approve the ECC Report 327 for publication as contained in [Annex 13](https://www.cept.org/Documents/wg-se/66596/se-21-112a13_ecc-report-327-studies-related-to-an-update-of-uwb-regulatory-framework). The corresponding WI SE24\_63 was closed.

* 1. **Partial draft ECC Report 322 (WI SE40\_40): Compatibility studies to be conducted according to ERC/DEC/(99)06**

Partial draft ECC Report 322 deals with compatibility studies between various S-PCS in order to be taken into account for introduction of new system(s) in the Annexes of ERC/DEC/(99)06.

The outcome of the public consultation is available in input Doc. [SE(21)103](https://www.cept.org/Documents/wg-se/66118/se-21-103_outcome-of-the-pc-on-partial-draft-ecc-report-322) and associated annexes and proposed revised partial draft revision of ECC Report 322 after review by SE40 of the received comments in Doc. [SE(21)093A01](https://www.cept.org/Documents/wg-se/66437/se-21-093a01_draft-ecc-report-322_resolution-commentsplusfor_sending-pc).

All the comments were successfully resolved by SE40.

SE40 submitted to WG SE a proposal to inform FM44 that the UHF intra service and inter service studies for Myriota are completed.

After having reviewed the input documents on this topic, WG SE finally approved the sections of the ECC Report 322 as contained in [Annex 05](https://www.cept.org/Documents/wg-se/66588/se-21-112a05_partial-ecc-report-322-wi-se40_40-compatibility-studies-to-be-conducted-according-to-erc-dec-99-06).

The WI SE40\_40 stays open to finalise the remaining sections of the draft ECC Report 322.

WG SE agreed to send a liaison statement to FM44, copy WG FM to inform of the status of the partial ECC Report 322 final approval, as contained in [Annex 06](https://www.cept.org/Documents/wg-se/66499/se-21-112a06_liaison-statement-to-wg-fm44-on-the-status-of-draft-ecc-report-322-myriota-system).

# Report from Project Team SE7 (Compatibility and sharing issues of mobile systems)

* 1. **Progress report of SE7**

The progress report is contained in Doc. [SE(21)089](https://www.cept.org/Documents/wg-se/66239/se-21-089_se7-progress-report).

* 1. **Expected deliverables for public consultation or other deliverables**
		1. **WI SE07\_31: UAS in the 1880-1920 MHz bands**

WI SE7\_31 aims to provide technical compatibility studies related to UAS (Unmanned Aircraft System) in the 1880-1900 MHz and 1900-1920 MHz bands for the governmental use of command and control as well as payload systems by UAS.

The studies are considering the following applications:

* DECT in the frequency band 1880-1900 MHz,
	+ MCL studies are done for the UAS impact on both indoor and outdoor DECT. Studies consider both -65 dBm and -75 dBm DECT wanted signal level. It was argued that even lower level value (-85 dBm) could be appropriate for the most sensitive DECT use scenarios. Also Monte Carlo studies have been done on UAS impact on DECT. They take into account UAS UE power control capability and also DECT property of instant dynamic channel selection, which both improve the compatibility
* FRMCS in 1900-1910 MHz,
	+ The MCL studies show that a co-channel operation of UAS in the FRMCS band 1900-1910 MHz is not feasible and will lead to a significant interference risk towards the FRMCS operation. The Monte Carlo simulation in adjacent channel operation shows that interference from UAS to FRMCS UE is negligible. On the contrary, interference to the FRMCS BS is more likely. Additional protection of the FRMCS receiver can be achieved if the out-of-band limits for UAS GS and UE are tightened and RMR BS blocking requirements are improved.
* MFCN in 1710-1875/1805-1880 MHz and 1920-1980/2110-2170 MHz
	+ This Report considers in-band and adjacent band studies between UAS and these systems. SEAMCAT and Monte-Carlo studies have been performed for both MFCN BS impact on UAS and UAS impact on MFCN UE below 1880 MHz. Interference from UAS UE to MFCN1800 DL (UE reception) is negligible, whereas interference from MFCN BS to UAS UE is possible, when UAS is in the sub-band 1880-1890 MHz. MCL and Monte-Carlo studies have been performed for UAS GS and UE impact on MFCN BS above 1920 MHz, when UAS is at 1915 MHz (10 MHz BW) or 1917.5 MHz (5 MHz BW). The interference probability for the most impacted MFCN BS is 7 % in urban area, when the separation distance is 250 m. SEAMCAT simulation show that interference from MFCN UEs to UAS (both GS and UE) translate to throughput losses between 0.1 to 1.6 %

The SE7 Chairman was invited by WG SE to submit during the public consultation a matrix compiling the results of sharing and compatibility studies by frequency bands under consideration in this report.

The discussion in FM59 on the definition of “governmental drone” was reported by the DECT Forum, expressing their concerns about the occurrence of the governmental use (potentially similar to PPDR). WG SE noted that this definition is under the responsibility of WG FM.

After having reviewed the input documents from SE7 on this topic, WG SE agreed:

- to add an editor’s note suggesting that a table summarizing the main conclusions of the technical studies may be added during the Public Consultation,

- to approve provisionally for public consultation the draft ECC Report 332 as contained in [Annex 10](https://www.cept.org/Documents/wg-se/66593/se-21-112a10_draft-ecc-report-332-technical-compatibility-studies-related-to-uas-unmanned-aircraft-system-in-the-1880-1920-mhz-band).

* 1. **WI in progress**

There is no other WI in progress.

* 1. **New WI**

There was no new WI.

* 1. **Other issues**

No other issues are identified.

#  Report from Project Team SE19 (Fixed Service)

* 1. **Progress report of SE19**

The progress report is contained in Doc. [SE(21)090](https://www.cept.org/Documents/wg-se/66241/se-21-090_se19-progress-report).

* 1. **Expected deliverables for public consultation or other deliverables**
		1. **WI SE19\_46: Revision of ECC Report 173**

This WI aims to study and gather up to date information related to developments in the FS in CEPT.

Last update of the current ECC Report 173 was in 2018 with data from 2016. The FS continues to evolve to meet the changing needs of future networks including backhaul for mobile. The demand for higher capacity FS links is increasing and it is timely to get the most up to date information on current usage and future trends in FS. This information is expected to be useful for administrations, industry and operators to facilitate a range of discussions.

Revised version of the draft questionnaire, with editorial adjustments to the previous outcome from SE19 was considered and agreed by SE19 to be sent to WG SE in order to submit the questionnaire together with the questionnaire on representative FS parameters to CEPT administrations, industry and operators.

SE19 proposes the date of 28.02.2022 to give administrations, industry and operators sufficient time for providing answers.

WG SE noted the progress of the activities, endorsed the questionnaire as contained in [Annex](https://www.cept.org/Documents/wg-se/66599/se-21-112a16_questionnaire-for-revision-of-ecc-report-173) 16 and agreed to send it at the same time as the questionnaire on FS parameters.

WG SE agreed to extend the deadline of this WI to January 2023.

* + 1. **WI SE19\_47: FS parameters for the sharing and compatibility studies**

The scope of the WI is to collect up to date technical FS parameters from CEPT countries and compile thereof a set of representative technical FS parameters for each FS band to be used in sharing and compatibility studies.

Beside the questions on representative FS parameters, SE19 agreed, that the administrations, industry and operators should provide also “typical FS links” which could be used in sharing and compatibility studies. It was clarified during the discussion, that the answers to the questionnaire themselves should not be used for the studies, but that SE19 should carefully review the results and compile a technical report thereof. Neither clutter situation nor classification of deployment (rural, urban etc…) were agreed to be taken into account in the questionnaire but need further consideration and discussion in SE19.

SE19 agreed to send the draft questionnaire to WG SE in order to submit the together with the questionnaire for the revision of ECC Report 173 to CEPT administrations, industry and operators.

SE19 proposes the date of 28.02.2022 to give administrations, industry and operators sufficient time for providing answers.

It is noted that the questions will be incorporated in an EXCEL file after the WG SE meeting to ease the responses for administrations and stakeholders.

WG SE noted the progress of the activities, endorsed the questionnaire as contained in [Annex 17](https://www.cept.org/Documents/wg-se/66600/se-21-112a17_questionnaire-on-fs-parameters-for-the-sharing-and-compatibillity-studies-wi-se19_47) and agreed to send it at the same time as the questionnaire for the revision of ECC Report 173.

WG SE agreed to extend the deadline of this WI to January 2023.

* 1. **WI in progress**

WG SE considered the SE19 progress on the following items:

* + 1. **WI SE19\_24: Coordinated inputs to ITU-R WP5C**

This WI considers the coordination of contributions related to FS channel arrangements to ITU-R F series recommendations.

No input contribution regarding this WI was received by SE19.

The ITU-R WP5C chair, Mr. Pietro Nava informed SE19 about the activities of WP 5C at its meeting in May 2022. One of the main tasks was the work on the introduction ITU-R recommendations for D and W band according to the ones already existing in CEPT and discussion of protection of EESS related to these bands. Guidance from satellite (WP 7C) on protection limits for EESS is needed, to be included in a specific Recommendation, to be progressed in parallel.

WG SE noted the discussions on ITU-R coordinated inputs and that no input was received.

* + 1. **WI SE19\_43: To derive a methodology for protection criteria for FS except long term**

This WI is dealing with the definition of a methodology for the protection criteria for the fixed service except long term.

The Recommendation ITU-R F.758, which is among the fixed service reference document, has not detailed the practical protection criteria of FS other than the long-term criterion based on availability objectives. The actual methodologies for FS protection criteria (including short-term) from time-varying interference for specific bands are subject to several ITU-R recommendations of the F recommendation series. These Recommendations provide general methodologies for evaluating those protection criteria without showing how to practically derive them for other interfering cases, for which the warning that “further study is needed” is given.

The current revision does not contain the revision of the "technical" part describing the applications of the fractional degradation of performance (FDP) and short-term methods (i.e. sections 5 and 6) which still need to be revised. Also the section “Derivation of the rain probability density function (PDF) from its cumulative distribution function (CDF)” (previously based on ITU-R P.1853) should be revised. SE19 intensively discussed the results of examples of FDP calculation showing differences depending on the propagation model used, and concluded that a complete review and restructuring of the current WD is necessary. SE19 agreed that a simplification of the methodology should be made as well as a detailed step-by-step guideline on how to use and implement the methodology should be included in the draft report. The group had a common view, that it is very important the other PTs and users clearly understand the methodology and how to apply it for sharing and compatibility studies.

WG SE noted the progress of the activities and agreed to extend the deadline of this WI to January 2023.

* + 1. **WI SE19\_44: New microwave PMP technologies based on active antennas for 5G backhaul above 27.5 GHz**

This WI aims to assess the technical feasibility of a new microwave transport network PMP system based on active antennas, beamforming and interference cancellation techniques, and to evaluate coordination as well as aspects of planning with existing FS including suitable frequency bands / approaches for these new PMP systems in the bands already allocated to the FS above 27.5 GHz.

The introduction of 5G systems (IMT-2020) is raising new requirements to their backhaul networks, particularly demanding in case of microwave backhaul. In some cases traditional PtP and PMP microwave systems might not be capable to meet the new requirements. Therefore, under this work item it is considered new microwave transport network PMP system based on active antennas, beamforming and interference cancellation techniques.

The draft working document has been reviewed in detail by SE19, based on received contributions, which raise technical comments. It was not possible to reach a full consensus of the treatment of the 28 GHz band in the report, consequently, the draft report was restructured in order to shift all parts, which are directly related to 28 GHz band to the annex and leave only frequency agnostic parts in the main body.

It was clarified during SE19 that there is no ETSI harmonized standard for the proposed P-MP example based on the active antenna, and that there is no intention to change current regulation. The discussion about addressing this topic in the executive summary has been postponed to a later stage.

WG SE noted the progress of the activities and agreed to extend the deadline of this WI for June 2022.

* 1. **New WI**

There was no new WI.

* 1. **Other issues**
		1. **WI SE19\_45: Consideration of ECC Recommendations due to discrepancy with ERC REC 70-03**

No comments were received on this topic since last WG SE meeting.

WG SE formally withdrew the ECC Recommendations (05)02 and (09)01 and closed the WI SE19\_45.

* + 1. **Harmonised standard list**

SE19 was informed about TM4 activity on the revision of ETSI EN 302-217, for which the final publication is expected for 2022. The next revision of ETSI EN 302-217 has been initiated to incorporate the frequency ranges above 90 GHz (92-114.5 GHz and 130-175 GHz) in the standard. In addition, ETSI TM 4 has concluded activity on a mostly editorial and structural revision of ETSI EN 302-326-2 for PmP system is expected to be soon published by ETSI and sent to EC for possible publication in the OJEU, superseding the old R&TTE version.

# Report from Project Team SE21 (Unwanted emissions and receiver characterisation)

* 1. **Progress report of SE21**

The progress report is contained in Doc. [SE(21)091](https://www.cept.org/Documents/wg-se/66247/se-21-091_se21-progress-report-for-89th-wg-se).

* 1. **Expected deliverables for public consultation or other deliverables**
		1. **WI SE21\_22: Update of the ECC Report 249**

This WI aims:

* To collect and review measurements in particular for 5G BS and UE, fixed service and DTT measurements
* To review as appropriate, the existing parameters with up to date measurements if available and to complete with additional systems if possible

The results of the revision should determine if an update of ECC Rec (19)02 is required.

SE21 discussed the additions on DTT unwanted emissions (§5.1.3) and agreed on the proposed text.

SE21 discussed the measurements of 5G AAS 26 GHz base stations submitted to the previous meeting by the Russian Federation. At SE21, concerns were expressed and the sections on 5G measurements (§4.4 and §4.5) could not be agreed and were put in square brackets. Administrations were invited to contribute directly to WG SE to attempt to finalise these sections for approval for public consultation.

In Doc. [SE(21)108](https://www.cept.org/Documents/wg-se/66468/se-21-108_uk-comments-on-the-draft-revision-of-ecc-report-249), UK proposes to keep section 4.4 in the deliverables but remove section 4.5 highlighting their issues with the measurements, and to send the draft ECC Report for PC.

The contribution from UK received support from some administrations but some other administrations were in favour of keeping both sections 4.4 and 4.5. A common view was that the draft ECC Report should be sent to public consultation with the DTT measurements added in this draft revision.

GSA raised concerns on the representability of the tested equipment, which would not have passed the conformance tests in ETSI standards. The WG SE Chairman noted the lack of measurements from mobile industry stakeholders and invited them to contribute with new measurements to SE21, especially for 5G AAS base stations operating in the millimetre wave bands. GSA confirmed their intent to support the work of SE21 in this activity. Russian Federation and GSA informed the meeting that a joint measurement campaign with one manufacturer was planned, but it was delayed due to the current COVID-19 pandemic; it should be resumed when possible. WG SE Chairman welcomed the commitment of GSA for future work to provide 5G AAS measurements and proposed a way forward which was agreed by WG SE and described in the box below.

Germany noted the link between this WI and WI SE21\_25 both dealing with 5G AAS measurements. One of the two CG conveners clarified that these two WIs have some similarities, noting that WI SE21\_25 is focused on methodologies for 5G AAS measurements in the field to determine or estimate TRP.

After having considered diverging views expressed by administrations, WG SE agreed:

 - to approve provisionally for public consultation the draft revision of ECC Report 249 as contained in [Annex 08](https://www.cept.org/Documents/wg-se/66591/se-21-112a08_draft-revision-of-ecc-report-249), without sections 4.4 and 4.5 (on 5G AAS Base Station measurement respectively below 6 GHz and above 24.25 GHz),

 - to update the target date of WI SE21\_22 to September 2022

- to update the comments section of the WI to address it in a two step process:

 - First step to deal with DTT unwanted emissions in particular

 - Second step to introduce 5G AAS measurements in a second revision of ECC Report 249, keeping the available material as the baseline for the further work

* 1. **WI in progress**
		1. **WI SE21\_09: Coordinated inputs to ITU-R on unwanted emission issues.**

No proposal was received for the upcoming WP 1A.

WG SE noted the current status.

* + 1. **WI SE21\_24: Receiver resilience to transmission on adjacent frequency ranges**

The primary objective of this work item is to develop a recommendation on receivers to:

* Be used by CEPT / ECC in its sharing and compatibility work. and/or to be used by ETSI when developing Harmonised  Standards
* Provide limits and/or levels for receiver resilience from transmissions on adjacent frequencies based on various sources of information (ETSI, Measurement, data sheet)
* Provide limits and/or levels for a wide range / categories of receivers. Considering spectrum usage (e.g. ERC/REP 25).

The CG of SE21 highlighted the following as the key issues to address:

* Choice of desensitisation value M when calculating I\_blk
* Testing aspects (conformity testing)
* How is Method 1 applied?

Different views on the scope of the future recommendation were raised: on one hand how it might interact with conformance standards, and on the other hand that SE21 should focus on providing values suitable for sharing and compatibility studies which is an important CEPT deliverable.

WG SE noted the progress of the activities.

* + 1. **WI SE21\_25: Measurement of 5G active antenna system in the field**

This WI is to develop techniques and methodologies to determine or estimate TRP (with equivalent measurement metrics) by field measurements for both in-band and unwanted emissions (out of band domain and spurious domain) of 5G AAS.

During SE21, a summary of the discussions on 5G AAS measurements in the field at WP 1C was reported. A number of challenges are identified with the approach from WP 1C and therefore alternative methods are recommended. It was pointed out that there are some AAS available in FR1 (<6 GHz) which have an antenna connector allowing conducted measurements (Type-H). Over-the-air measurement methods were also discussed.

SE21 made progress in developing test methods for measuring in-band wanted signals of 5G AAS base stations. Nevertheless, further work is still required in the following areas:

* Test methods for measuring unwanted signals in out-of-band (OOB) and spurious domains;
* Validation of proposed test methods for measuring in-band wanted signals; and
* Measurement uncertainty and other practicality issues.

WG SE noted the progress of the activities and agreed to extend the deadline of this WI to September 2022.

* + 1. **WI SE21\_23: Development of an algorithm for receiver Intermodulation (IM)**

SE21 received a liaison statement from STG on the receiver intermodulation algorithm asking their view on the proposed modifications to receive confirmation or comments.

WG SE noted the current status and the WI was reactivated.

* 1. **New WI**

There was no new WI.

* 1. **Other issues**
		1. **Proposal to modify ERC/REC 74-01 without public consultation**

SE21 prepared a marked up version of the editorial revisions to ERC/REC 74-01 proposed by Sony at WGSE meeting #88 and submitted it to WG SE.

SE21 is also working on a live list of proposals for a future revision of ERC/REC 74-01.

WG SE considered the proposal to modify editorially the ERC/REC 74-01 as contained in [SE(21)091A02](https://www.cept.org/Documents/wg-se/66249/se-21-091a02_proposed-editorial-updates-to-erc_rec-74-01) without public consultation.

After having reviewed the input documents on this topic, WG SE agreed to modifications of the ERC/REC 74-01 as contained in [Annex 09](https://www.cept.org/Documents/wg-se/66592/se-21-112a09_editorial-updates-to-erc_rec-74-01), considered the changes of the editorial nature and approved the updated document without public consultation.

# Report from Project Team SE24 (Short Range Devices)

* 1. **Progress report of SE24**

The progress report of SE24 is contained in Doc. [SE(21)092](https://www.cept.org/Documents/wg-se/66251/se-21-092_se24-progress-report).

It was indicated that one day of 3 slots of 2 hours will be dedicated respectively to the WIs SE24\_60-2, 69 and 75 in October and that an additional meeting of 5 days is planned to be scheduled in December, additional to the regular meeting in January 2022.

* 1. **Expected deliverables for public consultation or other deliverables**
		1. **WI SE24\_60-1: generic WPT applications**

This WI covers generic WPT systems/devices operating in various frequency ranges e.g. 19-21 kHz, 58-62 kHz, 79-90 kHz and 100-300 kHz. A second ECC report under this work item is on the way for the generic WPT applications excluding electric vehicle charging (WPT-EV).

Even though the draft ECC Report is supposed to cover all kinds of WPT devices (except for WPT-EV), based on received contribution, it was agreed to shorten the Report by excluding the parts related to the medium and high power WPT applications, and the annexes have been shortened. The discussion continued during the second part of SE24#104 to review the remaining topics to address and SE24 agreed on the version of the draft ECC Report on WI 60-1 (Generic WPT applications) to be submitted to WG SE#89 meeting for approval for public consultation.

It was noted that a study available in the previous WG SE meeting dealing with amateur service was accidently removed and WG SE agreed to reincorporate it in the draft ECC Report copied from WG SE #88 outcome.

WG SE recognized that the draft ECC Report now contains only WPT with a maximum power of 30W, and that WPT with higher powers have been removed and may require further studies in a new deliverable. SE24 will report at next WG SE meeting on this topic.

After having reviewed the input documents on this topic, WG SE approved provisionally for public consultation the draft ECC Report 333 as contained in [Annex 11](https://www.cept.org/Documents/wg-se/66594/se-21-112a11_draft-ecc-report-333-generic-wpt-applications).

*Statement from France*

France would like to indicate that the aggregate Monte Carlo study in Annex 6 of Draft ECC Report associated with WI SE24\_60-1 does not take into account unwanted emissions from WPT devices, leading to underestimate the amount of additional noise in the victim receiver but it has not been possible to have detailed technical discussion on this particular point. France informs WG SE that this point among others will be raised during the public consultation on draft ECC Report 333.

* + 1. **WI SE24\_71: UWB radiodetermination in the range 116 - 260 GHz**

This WI aims to carry out studies for sensor types and scenarios A, B, and C taking into account the ETSI SRDoc TR 103 498. The studies can also include other types of UWB technology based sensors which are not described in ETSI TR 103 498. Such information may be considered based on contributions within the process. One example is automotive radars.

SE24 provided an updated version of the draft ECC Report to WG SE.

IARU highlighted that the draft ECC Report states that not all required studies with other services including amateur service, have been done for three UWB systems. The Chairman of SE24 indicated that this situation is due to lack of contributions.

After having reviewed the input documents on this topic, WG SE approved provisionally for public consultation the draft ECC Report 334 as contained in [Annex 12](https://www.cept.org/Documents/wg-se/66595/se-21-112a12_draft-ecc-report-334-uwb-radiodetermination-in-the-range-116-260-ghz).

* 1. **WI in progress**
		1. **WI SE24\_60-2: EV-WPT applications**

This WI covers electric vehicle charging (WPT-EV).

The working document was amended based on the received contributions by SE24, which would seek guidance from WG SE on the type of deliverable between an addendum to the already published ECC Report 289 on the WPT-EV applications or a new Report.

It was clarified that several measurements were expected to be provided by different administrations and members.

WG SE noted the progress of the activities and agreed that the outcome of this WI should be added to ECC Report 289 as a new addendum.

* + 1. **WI SE24\_69: New co-existence studies between various SRD applications and SRDs in data networks**

This WI aims to study the various solutions for coexistence

-                            between different SRD technologies in data networks

-                            between SRDs in data networks and other SRDs

The study is based on operations in line with the current regulation in ERC REC 70-03 Annexes 1 to 2 and in those new bands in the current EC SRD Decision. UL transmissions will also be taken into account.

Several contributions were received by SE24 and introduced but due to lack of time, not discussed. A new structure of the draft Report was developed by SE24 but the draft ECC Report on WI SE24\_69 kept all changes in track changes in the new structure.

(See § 9.1 on SE24 planned meeting)

WG SE noted the progress of the activities.

* + 1. **WI SE24\_73: Radiodetermination equipment for ground based vehicular applications within the frequency range 77 - 81 GHz**

This WI is dealing with requests sharing and compatibility studies based on the information provided in the ETSI SRdoc TR 103 593 V1.1.1\_0.1.5 (2020-02) (Doc. [SE(20)065](https://www.cept.org/Documents/wg-se/58138/se-20-065_ls-etsi-erm-to-wgfm-on-srdoc-tr-103-593-radiodetermination-equipment-for-vehicular-applications-within-the-frequency-range-77ghz-to-81ghz)).

Based on contribution received by SE24, the draft ECC Report was updated but it was not possible to finalize it to be submitted to WG SE for public consultation.

WG SE noted the progress of the activities and agreed to extend the deadline of this WI for three meeting cycles.

* + 1. **WI SE24\_74: Security scanners (SScs) in the frequency range 60 GHz to 90 GHz**

This WI aims to conduct sharing and compatibility studies based on the information provided in the ETSI SRdoc TR 103 664 V1.1.1\_0.1.2 (2020-01-22) (Doc. [SE(20)067](https://www.cept.org/Documents/wg-se/58140/se-20-067_ls-etsi-to-wgfm-on-tr-103-664-security-scanners)).

Based on contribution received by SE24, the draft ECC Report was updated but it was not possible to finalize it to be submitted to WG SE for public consultation.

WG SE noted the progress of the activities and agreed to extend the deadline of this WI for two meeting cycles.

* + 1. **WI SE24\_75: Additional UWB radiodetermination applications within the frequency range 116 GHz to 260 GHz for vehicular use**

This WI aims to complement the studies conducted under WI SE24\_71 to two additional vehicular systems

SE24 agreed to create a clean version of the draft working document on this work item as the basis for further studies seeking guidance from WG SE on type of deliverables as an addendum to the draft ECC Report on WI SE24\_71, or a new ECC Report.

Mr. Dries Neirynck (UWB Alliance) was nominated as rapporteur for this WI and is expected to be appointed in October (see § 9.1 on SE24 planned schedule).

WG SE proposed to reflect the outcome of this WI in an addendum to the draft ECC Report 334 if the deliverable is ready for public consultation at the WG SE #90 in January 2022 or this question will be re-discussed at the next WG SE, taking into account the status of draft ECC Report 334.

WG SE noted the progress of the activities, noted the nomination of the rapporteur.

* 1. **New WIs**

There was no new WI.

* 1. **Other issues**

See §4.5 to note the SRdoc sent by ETSI "Technical Characteristics for Radio Equipment used for power transfer and communication with associated peripheral devices using the 917,5 MHz RFID interrogator channel" was announced for further consideration within CEPT work.".

# Report from Project Team SE40 (Space service compatibility issues)

* 1. **Progress report of SE40 and general topics**
		1. **Progress report**

The progress report of SE40 is contained in Doc. [SE(21)093](https://www.cept.org/Documents/wg-se/66436/se-21-093_se40_chairman_report).

* + 1. **WI SE\_12: Iridium interference measurement in the band 1610.6-1613.8 MHz in Leeheim as requested in ECC/DEC/(09)02**

SatMoU provided the results of the measurements in Doc. [SE(21)106](https://www.cept.org/Documents/wg-se/66329/se-21-106_ls-from-satmou-to-se) and provided report on Iridium unwanted emisions 1610-1613.8MHz by space radio monitoring station Leeheim in Doc. [SE(21)106A1](https://www.cept.org/Documents/wg-se/66330/se-21-106a1_report_iridium_2021-06-10). No detailed analysis of these measurements took place during SE40 meeting noting that some discussions and additional clarifications were ongoing. Offline discussion was found to be necessary before proceeding to further explore and process the data files provided by Leeheim.

WG SE noted the progress of the activities.

* 1. **Expected deliverables for public consultation or other deliverables**
		1. **WI SE40\_38: Sensing mechanism for uncoordinated FSS Earth stations in the 28 GHz band**

The subject of this WI is to study sensing mechanism for uncoordinated FSS Earth stations in the 28 GHz band to protect FS receivers.

SE40 agreed to take into account the various proposals received in input contributions and after further clarifications and editorial improvements, a draft ECC Report was agreed to be submitted to the next WG SE seeking the adoption for Public Consultation.

The lack of information on the FSS sensor was pointed out as the technology for the FSS sensor is not mature yet. After the Chairman of WG SE asked the view of the satellite community, one of the satellite operators attending the meeting clarified that there were no near-future plans from satellite industry on this work item.

The values of the different parameters considered for FSS sensor in this draft ECC Report are based on assumptions that are not referring to a technology proposed by the industry.

The draft ECC Report provides additional information on FS parameters to ensure proper protection of the FS receivers and these parameters are mature to be considered for the protection of the FS when defining FSS sensor.

The ECC Report was supported to be sent for public consultation as it contains relevant parameters for the FS on this topic.

Germany invited the satellite community interested in such FSS sensors to consider developing a SRdoc within ETSI.

After having reviewed the input documents on this topic, WG SE approved provisionally for public consultation the draft ECC Report 335 as contained in [Annex 15](https://www.cept.org/Documents/wg-se/66598/se-21-112a15_draft-ecc-report-335-sensing-mechanism).

* + 1. **WI SE40\_40: Compatibility studies to be conducted according to ERC/DEC/(99)06**

This section of the WI is dealing with the parts of the draft ECC Report 322 that were not in public consultation and remain within SE 40 relative to the introduction of new system(s) in the Annexes of ERC/DEC/(99)06.

SE40 agreed on the new elements from Myriota to be included in draft ECC Report 322, namely setting the operational constraints for Swarm and Myriota (in VHF) and including the intra-service sharing studies involving these systems and the relevant sections of the draft revised ECC Report 322 was updated.

After having reviewed the input documents on this topic, WG SE approved provisionally for public consultation the parts highlighted in green in draft partial ECC Report 322 as contained in [Annex 14](https://www.cept.org/Documents/wg-se/66597/se-21-112a14_partial-draft-ecc-report-322-compatibility-studies-to-be-conducted-according-to-ercdec-99-06).

* 1. **WI in progress**
		1. **WI SE40\_39: Compatibility between RNSS and amateur**

The WI is dealing with the development of possible scenarios with conditions or limitations that may be applied to the amateur service to ensure the future coexistence of both services and avoid cases of interference based on the two measurement reports.

Based on received contributions (updated MCL analysis and measurements), the draft ECC Report was updated.

WG SE noted the progress of the activities.

* + 1. **WI SE40\_40: Compatibility studies to be conducted according to ERC/DEC/(99)06**

This section of the WI is dealing with the parts of the draft ECC Report 322 that were not in public consultation and remain within SE 40 relative to the introduction of new system(s) in the Annexes of ERC/DEC/(99)06.

SE40 Chairman highlighted that last SE40 considered a proposal to add references to two RR footnotes (5.218 and 5.219) in the introduction of the Report, which was already approved.

WG SE noted the progress of the activities and agreed to extend the deadline of this WI for two meeting cycles.

WG SE agreed that SE40 may include references to RR footnotes 5.218 and 5.219 in the introduction of the draft ECC Report at its next meeting.

* + 1. **WI SE40\_43: Receiver selectivity performance of satellite earth stations operating in the frequency band 3800-4200 MHz**

The WI is dealing with the study of possible improvements of receiver selectivity performance (in particular LNA and LNB, including filtering) of satellite earth stations operating in the frequency band 3800-4200 MHz, in order to facilitate coexistence with MFCNs operating in the adjacent band.

It has been recalled that the report shall not deal with possible revisions of the requirements (for instance o.o.b. emission limits) for MFCN in adjacent bands.

A stable draft ECC Report was agreed by SE40 but it was noted that further discussions are still needed mainly on the Executive Summary/Conclusions as well as the review of the annexes. It was also concluded that – following the terms of this WI – a liaison with SE21 would be needed, before the draft Report is submitted to WGSE seeking their adoption for PC.

An ad-hoc webmeeting is scheduled by SE40 to progress further on this topic in particular to draft the LS to SE21.

WG SE considered progress of the activity and agreed to extend the deadline of this WI for two meeting cycles.

* 1. **New WI**
		1. **Aggregate interference to radioastronomy**

Following the guidance from WGSE, SE40 agreed the scope and other elements of the new work item on a methodology to compute the aggregate interference from satellite systems into radioastronomy stations (RAS).

There was no support for the proposal to broaden the scope to consider the aggregate effect into Earth stations of other services, noting that such studies could be undertaken after the conclusion of the work targeted in the new proposed WI.

Russian Federation expressed their interest for implementing methodology for EESS and MetSat. However, WG SE could not agree on the applicability of the existing methodology for RAS to other services but invited SE40 to further investigate how this proposal could be considered as they see appropriate and report to WG SE.

WG SE agreed to create a new WI SE40\_45 on the aggregate interference from satellite systems to radio astronomy, as contained in [Annex 18](https://www.cept.org/Documents/wg-se/66601/se-21-112a18_update-of-work-program), supported by Germany, Hungary, the Netherlands, the United Kingdom, Russian Federation, Sweden, and Switzerland.

* 1. **Other issues**
		1. **WI SE40\_41: Maritime NGSO ESIMs**

The WI was put on hold by WG FM.

As the LS from WG FM highlighted that work needed to be on hold until WRC-23, WG SE agreed to close this WI.

# Report from Project Team SE45 (WAS/RLANs in the frequency band 5925 – 6425 MHz)

* 1. **Progress report of SE45**

The progress report is contained in Doc. [SE(21)094](https://www.cept.org/Documents/wg-se/66250/se-21-094_se45-progress-report).

* 1. **Expected deliverables for public consultation or other deliverables**

No deliverables were expected for public consultation.

* 1. **WI in progress**
		1. **WI SE45\_03: OOBE Limits of 6 GHz VLP WAS/RLANs below 5935 MHz**

The WI aims to further investigate interference scenarios from Very Low Power (VLP) WAS/RLAN 6 GHz devices to communication based train control (CBTC) in order to comply with the ECC regulatory framework for WAS/RLAN at 6 GHz calling for a review of the OOB emission limit below 5935 MHz to be applied to Very Low Power (VLP) WAS/RLAN 6 GHz devices to be completed by 31st December 2024. The initial work should focus on the definition of agreed procedures and assumptions for field measurements as well as their specifications and planning. This could be complemented by further studies taking into account the results of measurements, the transmission patterns of VLP devices (e.g. activity factors, mitigation techniques), CBTC network planning, and the combined impact with respect to sharing and OOB emission levels.

Three measurement scenarios are proposed:

* Scenario 1: impact of an outdoor VLP WAS/RLAN operated on a platform to CBTC BS
* Scenario 2: impact of an outdoor VLP WAS/RLAN operated on a platform to CBTC TU
* Scenario 3: impact of a VLP WAS/RLAN operated on board a train to CBTC TU

The interfering signal generation and methodology for verifying interference at CBTC receivers need yet to be defined.

SE45 discussed one more scenario of interest to be included in the study

* Scenario 4: impact of a VLP WAS/RLAN operated on board a train to CBTC BS.

CAR 2 CAR highlighted that measurements are performed at ETSI level (STF 603) between CBTC and ITS, that may be of interest for SE45. The measurement are done, the analysis is under way and may be available soon.

SE45 Chairman also reminded that SE45 is in contact with JRC, which was willing to participate to any measurement campaign.

WG SE noted the progress of the activity and agreed to align the deadline with the WG FM activity milestones.

* 1. **New WI**

There was no new WI.

* 1. **Other issues**

No other issues are identified.

# STG (SEAMCAT)

* 1. **Progress report of STG**

The progress report is contained in Doc. [SE(21)097](https://www.cept.org/Documents/wg-se/66350/se-21-097_stg-progress-report).

It is noted that a Workshop for beginners is planned to the 16 and 17 November 2021 with remote only participation. The link to register is available on the CEPT workshops and STG page on ECC website (see [Link](https://www.cept.org/ecc/groups/ecc/wg-se/stg/client/meeting-calendar/)).

It was asked if a Workshop for advanced users could be scheduled by ECO.

* 1. **WI in Progress**

The WI is about the development of the CEPT simulation tool SEAMCAT including the supporting user manuals.

STG addressed:

* Official release of SEAMCAT v5.4.2
* Implementation of RX Intermodulation, and terrain profile tool in v.5.4.2.
* The status of SEAMCAT developments since last WG SE meeting;
* LS to SE21on RX intermodulation enhancements;
* The progress of ongoing work within STG related to SEAMCAT;
* The dates of the upcoming STG meetings.

The main features incorporated in SEAMCAT v.5.4.2 are listed below:

* Receiver intermodulation interference calculation EPP – weak nonlinearity check, ILT ensemble SEM integration, double convolution calculation implementing algorithm approved by WGSE
* Terrain profile tool - Tool implementing importing surface elevation model SRTM 1 Arc-Sec DEM, extracting digital terrain data profile and calculation of propagation loss using Recommendation ITU-R P.452.16
* New algorithm for interpolating antenna gain 3-D pattern from 2 orthogonal planes antenna gain cuts for H and V diagrams
* Release Check and Unit test enhancements - better support for plugins, UI-most parts of generic system is moved to the testable part
* Large simulations performance enhancements and resolving calculation bottlenecks - execute simulation events is batched, better use of processors
* Better handling of simulation results in CommandLine - when CL extracts workspace results it no longer need to load the full workspace, but only wanted vectors
* CDMA DL Capacity loss – adding external interference in calculating achieved quality parameter of EcIor for CDMA user terminal
* Victim Receiver blocking attenuation integration correction for very small Rx bandwidths and 99 kHz frequency difference
* Load OFDMA-DL settings for system layout from (older) workspaces
* Antenna Gain Plots – enhancement - second input parameter for the slice angles - Azimuth and Elevation slice angle; rename the parameter names of the steering angles to Azimuth and Elevation steering angle; add on the Show Gain plot an information that the steering angles are in global coordinates
* SEAMCAT Results report enhancement (Results / Generate Report)
* Considering correct terrain height above sea level at Tx / Rx in ITU-R P-1546-6 and ITU-R P-1546-5 when computing effective antenna heights
* Code separation of Core and UI modules

For issue tracking GitLab tracking is used and it is fully operational. Currently there are 20 ongoing open items in GitLab under different stages of development. Jira work items are kept for historical tracking of work and implementations done in previous versions on SEAMCAT. List of ongoing issues in SEAMCAT development can be found on SEAMCAT portal ([here](https://dev.seamcat.org/issue/index)) with a click on an issue of interest more details can be seen.

Administrations and stakeholders are encouraged to participate in STG meetings and to increase their involvement in SEAMCAT development, in particular related to the proposing and supporting enhancements and new features, testing of Alpha and Beta versions;

WG SE noted the progress of the activities.

* 1. **New WI**

There was no new WI.

# FG Wind Turbines

WI SE\_14: Technical impact of wind turbines on various radiocommunication services

No input contribution was received on this topic.

WGSE considered how to proceed with this WI in lack of contributions and agreed to put this WI on hold until the next WG SE where the status of this WI will be reconsidered.

# FG Weather radar (WR) and EESS

The WI SE\_16 aims to perform technical studies on compatibility between weather radars in part of 5365-5470 MHz and EESS (active), including Copernicus.

The progress report is contained in Doc. [SE(21)095](https://www.cept.org/Documents/wg-se/66392/se-21-095_fg-weather-radars-progress-report).

The FG WR collected the technical parameters of weather radars and EESS (active) at 5.4 GHz, taking due account of the relevant ITU-R Recommendations in order to perform the studies:

* Concerning the weather radars, two use cases will be studied in the Report
	+ One specific case, with the technical and operational parameters provided by Switzerland (updated from *"Radar 14"* in Recommendation ITU-R M.1849-2, including the associated scan strategy,
	+ One generic case, with the parameters derived from “*Radar 10*” in Recommendation ITU-R M.1849-2 and the representative scan strategy.
* Concerning the EESS (active) technical parameters, the FG agreed to consider the system parameters, extracted from the latest version of Recommendation ITU-R RS.2105, which are representative of EESS (active) sensors (SAR and altimeters) operated by CEPT administrations and space agencies.

The FG WR also discussed about the relevant scenarios and methodologies for the sharing studies:

* Taking into the dynamic nature of the weather radars and of the EESS (active) sensors, the FG agreed that it would not be relevant to perform static calculations based on worst case assumptions. The studies would thus mainly consist in dynamic simulations, with due consideration of the radars scanning strategy and of the EESS orbital information and the sensor’s dynamics.
* It was also agreed that, subject to contributions, both directions of interference (interference from weather radars into EESS (active) and also from EESS (active) into weather radars) would be addressed.

To align the scope of the work item with the terminology used in Recommendation ITU-R SM.1132 (see Annex 1 section 1, first paragraph) and the terms of reference of WG SE available in the Working Methods of ECC, the term “compatibility” is replaced by “sharing”.

The Chairman of the FG kindly invited administrations, space agencies and other members to participate in the work of this FG, noting that up to now there were few participants to the meeting.

WG SE noted the progress of the activity as contained in Doc. [SE(21)095A01](https://www.cept.org/Documents/wg-se/66393/se-21-095a01_draft-ecc-report-weather-radar) and agreed to adjust editorially the scope of the work item.

# Sat MoU: Leeheim measurements

Cf. see section 10.

# EMC and PLT issues

No report from CENELEC was provided for this meeting.

WG SE will continue its cooperation with CENELEC on EMC and PLT issues.

# Monitoring of the development of ETSI Harmonised standard

The WI SE\_11 is dealing with the monitoring of the development of ETSI Harmonised standards.

No input contribution was received, noting that ECO works on a new way to automate the flow of information. In its Report, ETSI Liaison Officer included the status of the Harmonised Standards.

The WG SE Chairman indicated that he will coordinate with ECO to further consider this WI in terms of objectives and efforts that are required.

WG SE noted the update of the activities.

# ECO

The ECO representative informed about the latest developments in the Office of WG SE interest (Doc. [SE(21)099](https://www.cept.org/Documents/wg-se/66356/se-21-099_eco-assistance-to-wgse)) and presented ECO Bulletin on other Regions (Doc. [SE(21)INFO003](https://www.cept.org/Documents/wg-se/66353/se-21-info03_eco-bulletin-on-other-regions-june-2021)).

# WG SE Work Programme – SE PT Terms of reference

ECO prepared a file as contained in document [SE(21)100](https://www.cept.org/Documents/wg-se/66466/se-21-100_scheduling-wi-progress) reflecting the updated Work programme associated to a Gantt chart to identify the deliverables to be sent for public consultation and those for final approval in order to ease its review.

The Work Programme was updated on a case-by-case basis and is available in [Annex 18](https://www.cept.org/Documents/wg-se/66601/se-21-112a18_update-of-work-program).

WG SE Chairman indicated that he will continue to coordinate and manage the activities allowing the most efficient progress of the work, noting that the current workload may lead to change in deadlines for some work items. Several administrations invited the PT Chairs to try to avoid overlaps of meetings.

WG FM, ECC PT1 and ETSI TC ERM were informed of the progress of the activities within WG SE via a liaison statement (see [Annex 04](https://www.cept.org/Documents/wg-se/66621/se-21-112a04_liaison-statement-to-wg-fm-ecc-pt1-and-etsi-tc-erm-on-the-results-of-the-89th-wg-se-meeting)).

The question raised by FG on weather radars on the terminology to be used between “sharing” and “compatibility” would have to be addressed with a generic approach by WG SE and the PTs.

# Any other business

WG SE agreed on the dates for the public consultation of WGSE deliverables:

- Notification period with administrations: 5th to 19th of October 2021

- Public consultation: 20th of October till 1st of December 2021

# Date and place of future meetings

The dates for the following WG SE meetings in 2022 are:

90th WG SE: 24 – 28 January 2022, Physical/Hybrid if possible

91st WG SE: 30 May – 3 June 2022, (tentative) Physical/Hybrid if possible

92nd WG SE: 26 – 30 September 2022, (tentative) Physical/Hybrid if possible

The two weeks around the Christmas period should remain free from any meeting.

It was also pointed out the difficulties with dates of meetings in ITU that changed due to the pandemic situation with sometimes a short notice leading to uncertainty in scheduling WG SE and PT sessions long in advance.

*Administrations are invited to consider hosting in 2022.*

# Approval of the Report of the Meeting

The minutes of the 89th WG SE meeting have been reviewed for approval by the participants. WG SE agreed that editorial corrections may be introduced by WG SE Chairmanship or ECO. The versions of the annexes (list of annexes available [Annex 02](https://www.cept.org/ecc/groups/ecc/wg-se/client/meeting-documents/file-history/?fid=66587)) in the minutes are not indicated, considering that the last version on the website prevails.

# Closure of the meeting

The meeting closed on Friday the 1st of October 2021, 12:00. The WG SE Chairman thanked all participants for the spirit of cooperation and wished to all to stay safe. He also thanked the WG SE chairmanship team and the Project Team Chairs for their excellent help and support. WG SE Chairman thanked also the administration of Denmark for their kind invitation.

WG SE Chairman thanked ECO for the organisation of this first experimental hybrid meeting within ECC in its facilities. The support of ECO was of great help before, during and after the meeting.