CEPT ECC
Electronic Communications Committee

ECC Report 317

Additional work on 26 GHz to address spectrum use under authorisation regimes other than individual rights of use: Technical toolkit to assist administrations

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0 EXECUTIVE SUMMARY

This Report provides information and guidance to assist administrations who are considering authorisation regimes for the 24.25-27.5 GHz frequency band other than individual rights of use without considering any changes to the technical conditions in ECC Decision (18)06 [1]. It covers local licences, light licences, nationwide general authorisation and local general authorisation.

When considering regimes other than the traditional method of authorising MFCN (i.e. national authorisation regimes which may be based on radio licences and/or spectrum Rights of Use), due to incumbent usages/deployments and depending on authorisation regimes, there may be a need to consider coexistence conditions and deployment scenarios at national level in order to ensure that other services are still protected.

The following ECC Reports and Recommendations provide guidance and information to administrations when considering different authorisation regimes:

- ECC Recommendation (19)01 "ECC Recommendation of 8 March 2019 on technical toolkit to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned EESS/SRS receiving earth stations in the 26 GHz band and the possibility for future deployment of these earth stations" [4];
- ECC Recommendation (20)01 "Guidelines to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned FSS transmitting earth stations in the frequency band 24.65-25.25 GHz and the possibility for future deployment of these earth stations" [5];
- ECC Report 303 "Guidance to administrations for Coexistence between 5G and Fixed Links in the 26 GHz band ("Toolbox")" [6];
  - Although this Report was developed under the assumption of an individual authorisation framework for 5G MFCN, it can provide some useful information if other authorisation regimes are to be considered. Knowledge of the locations and parameters of the 5G MFCN base stations is nevertheless necessary if coordination with fixed services is to be managed on a national basis;
- ECC Report 307 "Toolbox for the most appropriate synchronisation regulatory framework including coexistence of MFCN in 24.25-27.5 GHz in unsynchronised and semi-synchronised mode" [7];
  - In this Report, an authorisation regime where the base station locations are planned and well known was assumed. Additional studies would be required in order to extrapolate the conclusions of ECC Report 307 to a different authorisation regime with unplanned deployments.

The above ECC deliverables have been developed under the assumption of individual authorisation regime (traditional method of authorising MFCN (i.e. national authorisation regimes may be based on radio licences and/or spectrum Rights of Use)) in line with ECC Decision (18)06. When considering these recommendations and reports, administrations should also take into consideration this Report on the impact of different authorisation regimes from the traditional method of authorising MFCN.

This Report describes various authorisation regimes other than individual rights of use (including national authorisation regimes) which may be based on radio licenses and/or spectrum Rights of Use and includes the assessment of the impact of the different authorisation regimes to existing services without considering any changes to the harmonised technical conditions (ECC Decision (18)06). In some cases, it provides some possible solutions or guidance to be implemented at national level while respecting the harmonised technical conditions. There are certain authorisation regimes where a need for additional/supplementary studies has been identified. Finally, the Report contains some possible follow up actions.

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LIST OF ABBREVIATIONS

Abbreviation	Explanation
5G	Fifth generation wireless technology for digital cellular networks
BS	Base Station
CEPT	European Conference of Postal and Telecommunications Administrations
EC	European Commission
ECC	Electronic Communications Committee
EESS	Earth Exploration-Satellite Service
ETSI	European Telecommunications Standards Institute
FS	Fixed Service
FSS	Fixed Satellite Service
IMT	International Mobile Telecommunications
LRTC	Least Restrictive Technical Conditions
MNO	Mobile Network Operator
MFCN	Mobile/Fixed Communications Networks
RAS	Radio Astronomy Service
SRS	Space Research Service
TRP	Total Radiated Power
WRC	World Radiocommunication Conference

1 INTRODUCTION

This Report provides information to assist administrations who are considering authorisation regimes for 24.25-27.5 GHz other than individual rights of use (including national authorisation regimes) which may be based on radio licenses and/or spectrum Rights of Use and guidance to administrations particularly in relation to ensure coexistence with radio services (adjacent and in the band) in accordance with harmonised technical conditions contained in ECC Decision (18)06 [1].

This Report looks at different authorisation regimes (e.g. local licences, light licences, nationwide general authorisation and local general authorisation) from the traditional method of authorising MFCN (i.e. national authorisation regimes which may be based on radio licences and/or spectrum Rights of Use). Some of these licence types may be envisaged to be used for verticals by different industry sectors (e.g. transportation, M2M/IoT, industrial automation, PPDR, smart homes, smart grids, healthcare and media/entertainment at particular locations). In this Report, Mobile Network Operator (MNO) means either a public MNO, vertical MNO or any other MNO (neutral host, etc.).

The following ECC Reports and Recommendations provide guidance and information to administrations when considering different authorisation regimes:

- ECC Recommendation (19)01 “ECC Recommendation of 8 March 2019 on technical toolkit to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned EESS/SRS receiving earth stations in the 26 GHz band and the possibility for future deployment of these earth stations" [4];
- ECC Recommendation (20)01 “Guidelines to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned FSS transmitting earth stations in the frequency band 24.65-25.25 GHz and the possibility for future deployment of these earth stations” [5];
- ECC Report 303 "Guidance to administrations for Coexistence between 5G and Fixed Links in the 26 GHz band ("Toolbox")" [6];
  - Although this Report was developed under the assumption of an individual authorisation framework for 5G MFCN, it can provide some useful information if other authorisation regimes are to be considered. Knowledge of the locations and parameters of the 5G MFCN base stations is nevertheless necessary if coordination with fixed services is to be managed on a national basis;
- ECC Report 307 “Toolbox for the most appropriate synchronisation regulatory framework including coexistence of MFCN in 24.25-27.5 GHz in unsynchronised and semi-synchronised mode” [7];
  - In this Report, an authorisation regime where the base station locations are planned and well known was assumed. Additional studies would be required in order to extrapolate the conclusions of ECC Report 307 to a different authorisation regime with unplanned deployments.

The above ECC deliverables have been developed under the assumption of individual authorisation regime (traditional method of authorising MFCN (i.e. national authorisation regimes which may be based on radio licences and/or spectrum Rights of Use)) in line with ECC Decision (18)06. When considering those ECC Recommendations and ECC Reports, administrations should also take into consideration this Report on the impact of different authorisation regimes from the traditional method of authorising MFCN.

2 AUTHORISATION REGIMES AVAILABLE TO ADMINISTRATIONS FOR MFCN IN 26 GHZ

This Report has been developed considering the various authorisation regimes described in ECC Report 132 [8], which had reviewed the various terminologies that are still commonly used to qualify the type of "regulatory regime" or "licensing regime" that is applied when regulating the use of a radio application. Reference terminologies shown below are extracted from the report.

Table 1: Summary of authorisation regimes from ECC Report 132 [8]

Individual authorisation (Individual rights of use)		**General authorisation** (No individual rights of use)	
Individual licence (Note 1)	**Light-licensing**		**Licence-exempt**
Individual frequency planning/coordination Traditional procedure for issuing licences	Individual frequency planning/coordination Simplified procedure compared to traditional procedure for issuing licences With limitations in the number of users	No individual frequency planning/coordination Registration and/or notification No limitations in the number of users nor need for coordination	No individual frequency planning/coordination No registration nor notification
Note 1: Sometimes also referred to as "traditional licensing".			

The following authorisation regimes could be applicable either to the whole 26 GHz frequency band or parts of it. The procedure/method of allocation of rights of use does not impact the technical conditions for the usage of the band and is not addressed in this Report.

2.1.1 National licence

As is the case for the other MFCN harmonised frequency bands, this approach mainly refers to a traditional method of authorising MFCN through national licences (under individual authorisation) granted to MNOs (see example in ECO Report 03 [9]).

2.1.2 Local licences

This approach refers to licences limited to individual local areas:

- In this section "local" refers to an area identified at national level with a limited geographical size;
- The licence (individual authorisation) is granted to MNOs. The licence owners benefit from local rights of use in a given band subject to the authorisation.

Local licences may be granted to indoor or outdoor networks.

2.1.3 Light Licensing

This authorisation regime refers to one of two possible options described hereafter:

- Option 1: under individual authorisation, it refers to individual frequency planning/coordination with a simplified procedure compared to traditional procedure for issuing licences (as described in sections 2.1.1 and 2.1.2). This ensures a limitation in the number of possible licensees in a given location (mainly local with a limited size);
- Option 2: under general authorisation, there is no individual frequency planning/coordination. There is a requirement for registration of base station locations and/or notification of base station locations that allows control of the deployment and use of the application. There is no limitation in the number of users nor need for local coordination.

A combination of both above regimes refers to mixed approach as described in section 2.1.6 of this Report.

2.1.4 Nationwide general authorisation

The regime implies no individual frequency planning/coordination and no registration or notification of MFCN base stations. This regime is nationwide and can include outdoor and indoor usage (same approach as 2.4 GHz "WAS/RLAN" authorisation regime).

2.1.5 Local general authorisation

The regime implies no individual frequency planning/coordination and no registration or notification of MFCN base stations (same approach as "WAS/RLAN" authorisation regime). In this section, "local" refers to a geographic area identified at national level with a limited geographical size (e.g. a city or regional area) and which can include outdoor and indoor usage.

2.1.6 Others (mixed approaches)

For a given part of the band, the mixed approach refers to a combination of different authorisation regimes. For example:

- Outdoor national licence (2.1.1) and indoor general authorisation (2.1.4);
- Outdoor national licence (2.1.1) and indoor light licence (2.1.3 - Option 2).

3 ASSESSMENT OF THE IMPACT OF THE DIFFERENT AUTHORISATION REGIMES

This section assesses the impact of different authorisation regimes other than the national approach for MNOs as described in 2.1.1.

3.1 EESS/SRS AND FSS EARTH STATIONS

3.1.1 EESS/SRS earth stations

ECC Decision (18)06 [1] contains appropriate provisions to ensure the protection of existing EESS/SRS earth stations and the possibility for future deployment of EESS/SRS earth stations in this frequency band. ECC Recommendation (19)01 [4] has been developed to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned EESS/SRS receiving earth stations in the 25.5-27 GHz band by applying appropriate coordination zones based on calculated coordination contours. The exact coordination zones need to be analysed on a national basis:

- When the location of MFCN BS is known (local licences, light licensing, indoor licence), coexistence is manageable in the vicinity of the earth station inside the coordination zone (in the order of 4-70 km with 48 dBm/200 MHz e.i.r.p.);
- When the location of MFCN BS is not known (general authorisation (including local general authorisation)), an appropriate measure for ensuring the coexistence with EESS/SRS earth station is needed. The following options could be considered:

  a) A sharing solution, such as a cognitive solution with the use of database/geolocation that ensures that MFCN base stations are not within the coordination zones of EESS/SRS earth stations or that mitigations are applied, might be possible. Technical solutions to support implementation of databases/geolocation are emerging. However, no studies or proposals have been submitted in support of this mode to access to spectrum.

  b) Limiting the general authorisation[1] regime to be used outside the 25.5-27 GHz frequency band, where applicable.

In cases of interference, mechanisms to change the technical operation of MFCN BS equipment (e.g. reduce transmit power or switch-off the base stations) in the vicinity of an earth station could be implemented. Such mechanisms, which are yet to be defined, should limit the duration and impact of interference.

The ECC Reports and Recommendations highlighted in previous sections provide some guidance and information while considering other authorisation regimes such as indoor licensing. For example, the ECC Recommendation (19)01 [4] provides some guidance on defining the coordination zone around the EESS/SRS earth station. Requests for indoor licences can be refused within the coordination zone or within a predetermined radius around the EESS/SRS earth stations in the 25.5-27 GHz band.

3.1.2 Transmitting FSS earth stations

Concerning transmitting FSS satellite earth stations, the number of these earth stations (with a minimum antenna diameter of 4.5 m) would be limited. Studies show separation distances between MFCN base stations and that the coordination zones around FSS earth stations are from less than 100 m up to 10 km.

Therefore, by applying the MFCN authorisation regimes as described above, it should be taken into account that there is potential interference from FSS transmitting earth stations in the band 24.65-25.25 GHz. It would be sufficient to rely on the provision that equipment operating under authorisation regimes other than those where the BSs are registered (or location known) (i.e. general authorisation) are on a non-protection basis. However, it has to be recognised that certain 5G applications (e.g. verticals) refer to protection requirements that could impact the authorisation regime to be implemented.

[1] including local general authorisation, light licensing (Option 2

The following Recommendation is relevant: ECC Recommendation (20)01 “Guidelines to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned FSS transmitting earth stations in the frequency band 24.65-25.25 GHz and the possibility for future deployment of these earth stations” [5]. This provides guidance to administrations on the calculation of coordination zones and coordination contours around transmitting FSS earth stations in efforts to minimise the risk of interference to MFCN in the same frequency band. This Recommendation could also be considered for different authorisation regimes.

It is expected that there is a low risk of interference from transmitting FSS earth stations to indoor MFCN base stations. However, the impact to transmitting FSS earth stations may need to be considered on a national basis (see ECC Recommendation (20)01).

3.2 FIXED SERVICES

Fixed services (FS) are subject to national authorisations which vary in terms of duration. In some cases, authorisations could have a very long licensing term. Besides this authorisation, national coordination processes and bilateral or multilateral cross-border coordination are in place.

National coordination might be needed to manage the incumbent FS while introducing MFCN systems in the 24.25-27.5 GHz band for a certain authorisation regime. Various approaches or a combination thereof could be considered to manage co-channel or adjacent channel coexistence between MFCN and FS at 26 GHz, e.g. separation in space, separation in frequency, separation in angle.

Such national coordination between fixed services and MFCN is manageable where the location of MFCN BS is registered (local authorisation, light licensing (Option 1)).

ECC Report 303 [6] provides guidance to administrations for coexistence between 5G and fixed links in the 26 GHz frequency band.

It is expected that there is a low risk of interference to fixed link services with an indoor-only approach. However, the impact to fixed links may need to be analysed on a national basis.

3.3 FSS SATELLITE AND DATA RELAY SATELLITE SYSTEMS

Sharing studies carried out in the preparations for WRC-19, based on IMT-2020 parameters and assumptions provided by the relevant ITU-R study group, have shown that Fixed Satellite Service (FSS) and Data Relay Satellite systems would be protected. In consequence, sharing is feasible.

In order to ensure coexistence between MFCN and these satellites ECC Decision (18)06 includes the following provisions:

- There is a requirement that outdoor base stations have the antenna beam (electrical and mechanical) pointing normally below the horizon. In addition, the antenna of the outdoor base station shall have mechanical pointing below the horizon except when the base station is only receiving. This will limit the risk of interference towards satellites systems;
- A regular assessment of the MFCN network deployment characteristics and systems characteristics in a timeline consistent with the 5 years review process of the ECC Decision (18)06 will provide additional confidence that the LRTCs ensure adequate protection of these satellite services.

In case there is an increase in deployment density, base station power, or change in antenna pointing angles, there might be an increased risk of interference towards the satellite systems. The above actions will ensure possible long-term development of those satellite services. The use of licence regimes where the base station locations are planned and known (local authorisation, light licensing (option 1), indoor restriction (indoor licence)), would increase the protection of these satellite services.

In addition, market demand and the type of authorisation regime could impact the density of MFCN network deployment. Under authorisation regimes where there is no means to monitor the evolution of MFCN density and its deployment characteristics, an in-band limit for the TRP for MFCN equipment could be defined at

national level. This could compensate for the uncertainty related to the deployment density and to the effective implementation of the antenna pointing restriction, as well as the impossibility for reviewing precisely the effective deployment characteristics and their impact on the interference level to satellites.

3.4 PASSIVE SERVICES

The level of interference to EESS (passive) is mainly related to the density of MFCN deployment among other factors.

3.4.1 EESS (passive)

Unwanted emissions limits for the 23.6-24 GHz band are contained in European Commission Implementing Decision (EU) 2019/784 [2] (amended by Commission Implementing Decision (EU) 2020/590 [3]) and ECC Decision (18)06 [1].

In order to ensure possible long-term development of those satellite services, there is also a requirement that the outdoor base stations have the antenna beam (electrical and mechanical) pointing normally below the horizon (ECC Decision (18)06). A regular assessment of the MFCN network deployment characteristics and systems characteristics in a timeline consistent with the 5 years review process of the ECC Decision (18)06 will provide additional confidence that the LRTCs ensure adequate protection of the satellite service.

The use of licence regimes where the base station locations are planned and well known (local authorisation, light licensing (Option 1), indoor restriction (indoor licence)), would fulfil one of the assumptions for the protection of these satellite services.

In case of other regimes where the base station density is not known, the operational deployment conditions would need to be further studied in order to maintain long term protection of EESS (passive).

3.4.2 Radio Astronomy

The Radio Astronomy Service in the adjacent frequency band is subject to the MFCN unwanted emission limits which are contained in European Commission Implementing Decision (EU) 2019/784 [2] (amended by Commission Implementing Decision (EU) 2020/590 [3]) and ECC Decision (18)06 [1]. Coordination zones ensuring protection of individual RAS stations need to be calculated using site-specific terrain and clutter information. Hence coordination zones should be determined nationally on a site by site basis.

In some regulatory regimes where the location of BS is not known, some mechanism would be needed to ensure that mitigations are applied within the RAS coordination zones, in order to ensure protection of the site. No mechanism to prevent interference has been notified during the drafting of the report. In cases of interference, mechanisms to change the technical operation of MFCN BS equipment (e.g. reduce transmit power or switch-off the base stations) in the vicinity of a radio astronomy station could be implemented. Such mechanisms, which are yet to be defined, should limit the duration and impact of interference.

3.5 MFCN COEXISTENCE

Technical studies for the 26 GHz band (coexistence between MFCN and other services in the band and adjacent to the band) were performed under the assumption of an individual authorisation regime.

Using established transmit parameters and reasonable assumptions on the protection criteria of MFCN it is possible to perform technical studies under a combination of individual/general authorisations regimes in the same part of the 26 GHz frequency band (in either parts of or the entire 26 GHz band). However, such studies have not been submitted to CEPT and no harmonised MFCN technical conditions have been developed for MFCN/MFCN coexistence for other regimes than individual authorisation.

CEPT has developed ECC Report 307 [7] reviewing solutions and regulatory options for synchronisation, in particular, to enable unsynchronised and semi-synchronised operation of MFCN in the 24.25-27.5 GHz band.

In addition, the Report identifies the most appropriate synchronisation regulatory framework at national level. ECC Report 307 contains simulations and analysis which forms useful information which can be considered under other authorisation regimes than individual authorisation (traditional). In the ECC Report 307, an authorisation regime where the base station locations are planned and known has been assumed, referring to the following authorisation regimes: local licences, light licensing (Option 1), indoor restriction (indoor licence).

Building penetration loss at 26 GHz offers additional isolation between indoor and outdoor MFCN systems.

MFCN equipment for the 26 GHz frequency band has been initially standardised under the assumption of a traditional licensed approach. At this stage, some parameters and scenarios for deployment of MFCN in the 26 GHz frequency band under unlicensed approach have not been fully defined.

4 FOLLOW UP ACTIONS

There is a need for administrations to assess during the initial phase of 5G any issue of interference from MFCN to incumbent usage (if any), in particular MFCN under general authorisation regime. There is a need to analyse and share the findings in CEPT and to take follow up actions as appropriate. Administrations are invited to share information on possible additional usage scenarios.

CEPT/ETSI cooperation ensures coherence between harmonised standards and harmonised technical conditions.

There is need for administrations to ensure that equipment placed on the market and operated in this band under a general authorisation regime would satisfy the required conditions to avoid interference being caused by non-compliant equipment (e.g. see ECC Action Plan on WAS/RLAN 5 GHz). This would include collaboration with ETSI when drafting the harmonised standards. In order to ensure rapid reaction in interference cases, this would involve national market surveillance, monitoring, enforcement and rapid reaction to interference cases.

5 CONCLUSIONS

This Report provides information to assist administrations who are considering authorisation regimes for the 24.25-27.5 GHz frequency band other than individual rights of use and guidance to administrations particularly in relation to ensuring coexistence with radio services but without considering any changes to the technical conditions in ECC Decision (18)06 [1]. Any alternative authorisation regimes would be based on the current technical conditions and framework.

It covers local licences, indoor licences, area licences, light licences, nationwide general authorisation and local general authorisation. Some of these licence types may be envisaged to be used for verticals.

The following ECC Reports and Recommendations provide guidance and information to administrations when considering different authorisation regimes:

- ECC Recommendation (19)01 "ECC Recommendation of 8 March 2019 on technical toolkit to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned EESS/SRS receiving earth stations in the 26 GHz band and the possibility for future deployment of these earth stations" [4];
- ECC Recommendation (20)01 "Guidelines to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned FSS transmitting earth stations in the frequency band 24.65-25.25 GHz and the possibility for future deployment of these earth stations" [5];
- ECC Report 303 "Guidance to administrations for Coexistence between 5G and Fixed Links in the 26 GHz band ("Toolbox")" [6];
  - Although this Report was developed under the assumption of an individual authorisation regime for MFCN, it can provide some useful information if other authorisation regimes are to be considered. Knowledge of the locations and parameters of the MFCN base stations is necessary if coordination with fixed services is to be managed on a national basis;
- ECC Report 307 "Toolbox for the most appropriate synchronisation regulatory framework including coexistence of MFCN in 24.25-27.5 GHz in unsynchronised and semi-synchronised mode" [7];
  - In this Report, an authorisation regime where the base station locations are planned and well known was assumed.

The above ECC deliverables have been developed under the assumption of individual authorisation regime (traditional method of authorising MFCN (i.e. national licences)) in line with ECC Decision (18)06. When considering those Recommendations and Reports, administrations should also take into consideration this Report on the impact of different authorisation regimes from the traditional method of authorising MFCN.

When considering regimes other than the traditional method of authorising MFCN (i.e. national licences), due to incumbent usages/deployments and depending on authorisation regimes, there may be a need to consider coexistence conditions and deployment scenarios at national level.

In this frequency band, indoor deployment of MFCN benefits from lower interference to other outdoor services due to building penetration loss, and therefore has the potential for early deployment.

5.1 EESS/SRS EARTH STATIONS

Coexistence is manageable when the locations of MFCN BSs are registered (local licences, light licensing, indoor restriction (indoor licence)) in the vicinity of the earth station inside the coordination zone. Coexistence is possible when these MFCN BSs are located far beyond from the coordination zone.

When the locations of MFCN BSs are not registered (general authorisation including local general authorisation), a solution for ensuring the coexistence with EESS/SRS earth station is needed, such as a cognitive sharing solution such as database/geolocation, or, limiting the general authorisation regime to be used outside the 25.5-27 GHz frequency band, where applicable. Technical solutions to support implementation of databases/geolocation are emerging. However, no studies or proposals have been submitted in support of this mode to grant access to spectrum.

5.2 TRANSMITTING FSS EARTH STATIONS

There is potential interference from transmitting FSS earth stations in the band 24.65-25.25 GHz into MFCN, but it would be sufficient to rely on the provision that equipment operating under authorisation regimes other than those where the BSs are registered (i.e. general authorisation) are on a non-protection basis.

It is expected that there is a low risk of interference from FSS earth stations to indoor MFCN base stations. The impact to FSS earth stations may be analysed on a national basis (see ECC Recommendation (20)01 [5]).

5.3 FIXED SERVICES

National coordination might be needed to manage the incumbent fixed services while introducing MFCN systems in the 24.25-27.5 GHz band for certain authorisation regimes. Various approaches or a combination of these approaches could be considered to manage co-channel or adjacent channel coexistence between MFCN and FS at 26 GHz. This is manageable when the locations of MFCN BSs are registered (local authorisation, light licensing (Option 1)).

It is expected that there is a low risk of interference to fixed service with an indoor-only approach. However, the impact to fixed links may need to be analysed on a national basis.

5.4 FSS SATELLITES AND DATA RELAY SATELLITE SYSTEMS

Sharing studies carried out in the preparation for WRC-19 have shown that these services would be protected with a positive margin and sharing with MFCN is feasible. A regular assessment of the MFCN network deployment characteristics and systems characteristics in a timeline consistent with a 5 year review process of the framework will provide additional confidence that the existing LRTC ensures adequate protection. The use of licence regimes where the base station locations are planned and well known (local authorisation, light licensing (Option 1), indoor restriction (indoor licence)), would enhance the protection of these satellite services.

Under authorisation regimes where there is no means to monitor the evolution of MFCN density and its deployment characteristics, an in-band limit for the TRP for MFCN equipment may be defined at national level.

5.5 PASSIVE SERVICES

5.5.1 EESS (passive)

The use of licence regimes where the base station locations are planned and well known (local authorisation, light licensing (Option 1), indoor restriction (indoor licence)), is assumed for the protection of this satellite service.

In case of other regimes where the base station density is not known, the operational deployment conditions would need to be further studied in order to maintain long term protection of EESS (passive).

5.5.2 Radio Astronomy

For registered MFCN base stations, coordination zones around RAS sites should be determined on a site by site basis at a national level. In some regulatory regimes where the location of BS is not known, some mechanism would be needed to ensure that mitigations are applied within the RAS coordination zones, in order to ensure protection of the site. No mechanism to prevent interference has been notified during the drafting of the report. In cases of interference, mechanisms to change the technical operation of MFCN BS equipment (e.g. reduce transmit power or switch-off the base stations) in the vicinity of a radio astronomy station could be implemented. Such mechanisms, which are yet to be defined, should limit the duration and impact of interference.

5.6 MFCN

At the time of writing this Report, there are no studies that illustrate the coexistence scenario with a combination of individual/general authorisations regimes in the same part of the 26 GHz frequency band (in either parts of or the entire 26 GHz band). However, it is possible to carry out these studies with established transmit parameters and reasonable assumptions on the protection criteria of MFCN. However, such studies have not been submitted to CEPT and no harmonised MFCN technical conditions have been developed for MFCN/MFCN coexistence for other regimes than individual authorisation.

Some Recommendations and Reports such as ECC Report 307 [7] could provide some useful insights. ECC Report 307 assumes an authorisation regime where the base station locations are planned and well known, referring to the following authorisation regimes: local licences, light licensing (Option 1), indoor restriction (indoor licence).

ANNEX 1: EXAMPLES OF NATIONAL APPROACHES USING AUTHORISATION REGIMES OTHER THAN INDIVIDUAL RIGHTS

A1.1 FRANCE: TRIALS FOR THE 26 GHZ BAND

A1.1.1 The 26500-27500 MHz band

Trials use the 26500-27500 MHz band which does not have fixed links.

A1.1.2 Type of authorisations

A1.1.2.1 Platform trials

In January 2019, the French Government and Arcep issued a joint call for the creation of 5G platform trials that would be open to third parties, using the 26 GHz band. The aim of this call was to pave the way for all players to embrace the possibilities this frequency band provides, and to discover new uses for 5G.

These licences authorise the use of wide frequency bands for a period of up to three years. The trial licensees (experimental authorisations) must have an operational 5G trial network by 1 January 2021 at the latest and must make it available to third parties to perform their own 5G trials.

It is necessary to anticipate the case where other applications for 5G trial platforms would be received by Arcep on the band that is the subject to this allocation on the same area. Moreover, Arcep has also planned to grant permanent licenses for the deployment of mobile networks in the same band. Arcep may therefore limit the quantity of frequencies allocated to the licensee to a “reasonable quantity” to ensure the proper functioning of its trial platform from the date on which actors other than the licensee wish to use them effectively.

The exchanges Arcep has had with the stakeholders led it to set this reasonable quantity at 400 MHz, which is estimated by several actors as a satisfactory quantity to exploit the possibilities of 5G. It is recalled that in the absence of requests from third parties to have frequencies in the 26 GHz band, the licensee will continue to have all the frequencies allocated to it by a platform trial decision.

Details on the eleven projects selected to date can be found in this website. An example of the platform trials can be found here. The process is ongoing.

A1.1.2.2 Standard trials

Arcep is issuing “standard” trial licences. These licences authorise actors to use wide frequency bands for a period of up to six months.

In contrast to trial platforms, Arcep does not guarantee the allocation of a “reasonable quantity” of frequencies to the licensee to ensure the proper functioning of its standard trial from the date on which actors other than the licensee wish to use them effectively.

Arcep has issued authorisations for five standard trials. An example of the standard trials can be found here. The process is ongoing.

A1.1.2.3 Technical conditions

The authorisations for trials are granted on the basis on non-protection and non-interference basis. Technical conditions of EC Decision (EU) 2019/784 [2] (amended by Commission Implementing Decision (EU) 2020/590 [3]) are applicable.

A national procedure has been established by ANFR, the ministry of industry with Arcep and all other concerned ministries in order to identify receiving EESS/SRS earth stations operating in 25.5-27.0 GHz.

Coexistence conditions between 5G and those stations have been established by ANFR studies in accordance with ECC Recommendation (19)01 [4].

In addition, other experimental authorisations could be granted in the band in the area concerned by this allocation. In this case, licensees for these 5G experiments are not protected against interference from each other.

In this context, it is up to the various holders of 5G experiment authorisations to come together to define together the necessary technical adaptations beyond harmonised technical conditions (EC Decision (EU) 2019/784 amended by Commission Implementing Decision (EU) 2020/590), such as the synchronisation of their networks, in order to avoid interference and to allow the correct functioning of the respective experiments of each of the holders. In addition, the licensee shall immediately stop the experiments related to the use of radio spectrum allocated by the authorisation in case of interference to other spectrum users which have a guarantee of non-interference.

Reports from trials will be used to clarify technical conditions beyond harmonised technical conditions (EC Decision (EU) 2019/784 amended by Commission Implementing Decision (EU) 2020/590).

ANNEX 2: LIST OF REFERENCES

[1] ECC Decision (18)06: "Harmonised technical conditions for Mobile/Fixed Communications Networks (MFCN) in the band 24.25-27.5 GHz", approved October 2018[2]

[2] Commission Implementing Decision (EU) 2019/784 of 14 May 2019 on Harmonisation of the 24.25-27.5 GHz frequency band for terrestrial systems capable of providing wireless broadband electronic communications services in the Union

[3] Commission Implementing Decision (EU) 2020/590 of 24 April 2020 amending Decision (EU) 2019/784 as regards an update of relevant technical conditions applicable to the 24,25-27,5 GHz frequency band

[4] ECC Recommendation (19)01: "Technical toolkit to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned EESS/SRS receiving earth stations in the 26 GHz band and the possibility for future deployment of these earth stations", approved March 2019

[5] ECC Recommendation (20)01: "Guidelines to support the introduction of 5G while ensuring, in a proportionate way, the use of existing and planned FSS transmitting earth stations in the frequency band 24.65-25.25 GHz and the possibility for future deployment of these earth stations", approved March 2020

[6] ECC Report 303: "Guidance to administrations for Coexistence between 5G and Fixed Links in the 26 GHz band ("Toolbox")", approved July 2019

[7] ECC Report 307: "Toolbox for the most appropriate synchronisation regulatory framework including coexistence of MFCN in 24.25-27.5 GHz in unsynchronised and semi-synchronised mode", approved March 2020

[8] ECC Report 132: "Light Licensing, Licence-Exempt and Commons", approved June 2009

[9] ECO Report 03: "Licensing of mobile bands in CEPT", November 2019

[2] a revision of this Decision is currently under public consultation and is expected to be approved in November 2020.