EBU R113 - 2005

Information Paper for EBU Members

on Submission of Broadcasting Input Requirements for RRC-06

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Contents

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It is the responsibility of administrations to submit input requirements for RRC-06.

In many cases, however, EBU members will wish to understand this process and/or assist their administrations with their contributions. This document explains the process that the RRC-04 adopted and the measures in place to resolve ambiguities. It also suggests means by which input requirement submissions might be prepared. It is intended only for guidance to EBU members.

1. The RRC Process

The RRC process consists mainly of three stages:

- submission of input requirements;
- assessment of the compatibility of those requirements; and
- a synthesis process by which frequencies are allocated to requirements.

This document deals primarily with the first of these steps, but in order to make effective inputs, some understanding of the compatibility analysis and synthesis is required.

2. Types of Input Requirement

RRC-04 defined four types of input requirement:

- a digital television broadcasting (DVB-T) assignment requirement;
- a digital television broadcasting (DVB-T) allotment requirement;
- a digital sound broadcasting (T-DAB) assignment requirement;
- a digital sound broadcasting (T-DAB) allotment requirement.

The RRC-04 report does not specify planning criteria for DVB-H, as they were unknown at the time. It is however possible to make input requirements for DVB-H by, for instance, specifying a DVB-T requirement with a system variant and other planning parameters if no standard RPC is suitable (see section on RPCs later). That DVB-T requirement will be able to be used for a DVB-H service if the latter does not create more interference than would be created by the DVB-T requirement and does not claim more protection than the DVB-T requirement.

The ITU-BR has prepared data format specifications by which the four input requirements mentioned above can be notified (detailed in CR/215 and any subsequent revision). CR/215 details an extension to the existing TerRaBase formats that allows submission of notices for each of these requirements. Annex 7 of CR/215 gives detailed information on the data to be notified, validation principles that will be applied and further explanations when necessary. Additionally, it has defined a common format for the submission of test points representing a geographical area for either sound or television allotments.

In addition to requirements for digital broadcasting, the ITU needs to be made aware of existing broadcasting stations and other services that need to be protected during the planning process. Each of these will be mentioned below; it is assumed that the existing broadcasting stations will be of more direct interest to EBU

members than other services. These are addressed in CR/217 for existing broadcasting services, and CR/216 and CR/220 for other services.

3. Important Dates

Input requirements for digital broadcasting must be submitted, after validation and if necessary correction, before:

- **28 February 2005** for the Planning Exercise.
- **31 October 2005** for the production of the Draft Plan.

If no requirements are submitted by an administration by the due date, the planning process will generate requirements for that country - it is not yet clear on what basis these will be created, and they may not represent what the country actually wants.

Additionally, administrations should submit:

- the list of existing and planned analogue TV assignments **not to be taken into account** by the RRC;
- the list of Other primary Services **to be taken into account** by the RRC.

If an Administration does not submit any list of analogue assignments not to be taken into account by the RRC, all existing and planned analogue assignments will be taken into account. Similarly, if an Administration does not submit the list of Other primary Service assignments to be taken into account by the RRC, none will be taken into account.

It should be noted that the RRC will not collect any data related to existing analogue assignments and Other primary Service assignments and will rely on the existing data in the ITU BR data bases. All efforts should be done to update those databases before the 31 October 2005 to make sure that the databases reflect the reality and do not contain errors.

31 October 2005 is also the date for the establishment of the Reference Situation, at which time existing broadcasting services must be co-ordinated and in the relevant existing plan if they are to be afforded protection in the planning process.

Submission of input data for the draft plan may include a complete set of input data or modification to previously (for the Planning Exercise or thereafter) submitted input data. There is no priority attached to input data with regard to date of submission, provided that the BR receives the input data by the relevant deadline (see above).

4. Co-operative Submissions

Administrations may, of course, make unilateral input requirement submissions. A process of bi- or multi-lateral negotiations which agree mutually compatible requirements before the submission date is more likely to achieve a satisfactory outcome. Such “pre-co-ordinated” requirements may be indicated as such in the input data submitted and the planning software will allow this to be cross-checked. However, it may not be entirely clear what is really meant by 'pre-co-ordination' as there is an implication that a requirement of one administration has been agreed by some other administration regardless of any possible interactions it may have with other requirements or with assignments of other services even in other countries. In any case, it seems to be essential to carry out compatibility analyses first and take account of any co-ordination agreements afterwards. At least, this ensures that all relevant information is readily available in the event of questions.

It would be convenient that additional information would be supplied by administrations with their pre-co-ordinated requirements than only the name of the administrations with which the co-ordination has been done. The objective of this information would be:

- In case of a theoretical incompatibility, to allow administrations to refer to the indications in order to decide if the following of the process may consider allotments as compatible or not.
- To initiate a trace of the bi or multilateral negotiations during the RRC itself.

That information would be submitted for pre-co-ordinated allotments or assignments and for allotments or assignments that are declared as mutually compatible without indication of a specific channel before synthesis.

However, there is no entry foreseen in the RRC requirement form to supply such information and nothing has been scheduled within the ITU, by the time being.

In view of the ambiguities associated with the existing procedure for indicating that co-ordination has taken place, it may be better to use the process of administrative declarations, already identified in Chapter 5 of the RRC Report, and described in the following section.

5. Compatibility Analysis & Synthesis Process

After receipt of all administrations' input requirements and after validation of the data, the ITU will conduct a compatibility analysis between each possible pair of requirements. The outcome of this analysis will indicate which pairs of requirements are compatible and may therefore use the same frequency channel.

The ITU will also carry out analyses to investigate compatibility between digital broadcasting requirements and existing or planned analogue assignments and Other Service assignments. These analyses are intended to identify which channels, of the set identified by an administration as being available for a given requirement, are actually available.

These compatibility analyses are not limited to purely technical calculations. There is the opportunity for administrations to declare pairs of requirements compatible that might appear, on the technical bases used, to be incompatible. Likewise, requirements which appear to be compatible can be declared incompatible. Similarly, administrations can make declarations with regard to the use of channels which the analyses indicate are not available for use.

This step allows administrations to implement any "pre-co-ordinated" agreements. However, there is currently no means defined to allow this to be done in a complete manner.

The synthesis process will then attempt, by a variety of different algorithms, to allocate frequency channels to requirements in such a way as to not cause incompatible requirements to share a channel. The solution with the maximum number of satisfied requirements may then be adopted as the result of the planning exercise or as the Draft Plan.

6. Allotments and Assignments

Allotments and assignments are given equal priority by the process. There is therefore no advantage or disadvantage of submitting requirements as allotments or assignments, or a mixture of both. Administrations should therefore select whichever best matches their future intentions for each input requirement.

7. Allotments OR Assignments?

The following applies to both DVB-T and T-DAB:

- An allotment requirement might be appropriate when an SFN is required, or the full details of the transmitters to be used to cover an area are not yet known, or where the transmitter details might be amended before, during or after implementation.
- Assignment requirements may be associated with an allotment requirement if, for example, the administration concerned has already "pre-co-ordinated" those assignments with other administrations, and which are covered by an administrative agreement, or also when an administration or an network operator planning for an SFN already knows the major transmitter sites while not knowing the complete SFN structure. The SFN identifier in the data format (see CR/215) will be used to link the allotment and the associated assignments Even if no procedure is still available at the moment, EBU members think that, in compatibility analysis, the interference potentials caused both by the RN and the assignments will be calculated and that the highest should be used.
- An assignment requirement might be appropriate when a network is to be implemented as an MFN, or all the relevant transmitter details are already known at the time that the plan is being made.

8. If Allotments are Appropriate

The interference potential of an allotment will be calculated on the basis of its boundary test-points and the Reference Network (RN) and any associated assignments specified.

An allotment's susceptibility to interference will be calculated on the basis of protecting the specified Reference Planning Configuration (RPC) or specified system variant and reception conditions at its boundary test-points.

An allotment is notified in a DT2 notice (for DVB-T), or DS2 notice (for T-DAB). Additionally, there may be one or more DA1 notices, if required to identify sub-national allotment areas.

Each allotment requires:

- Administration's unique ID
- Allotment name
- Choice of RN to be used even if associated assignments are also being specified

- Either:
  - RPC which is mandatory for T-DAB allotments; or
  - System variant and reception mode to be used in planning (only for DVB-T)
- Identifier for the SFN used (to cross link with assignments) if needed
- Polarisation to be used (can be “U” - unspecified, in which case no polarisation discrimination will be taken into account by the calculations done during the planning process)
- An indication of the geographical area to be covered, either as:
  - The identifier of the country for a whole-national allotment (in which case no DA1 notice is required); or
  - A series of boundary test-point co-ordinates (specified in DA1 notice(s))
- If applicable, data about the analogue assignment being converted into the allotment
- If required, an indication of acceptable channels from which one could be allocated (for DVB-T), or acceptable frequency blocks (for T-DAB)
- Optional remarks
- Optionally, one or more administrations with which the requirement has been “pre-co-ordinated”.

Note that boundary test-points in a DA1 notice will be tested to ensure that they lie within or on a country’s boundary as defined in IDWM – test-points found to be outside will be treated as erroneous. This would result in the DA1 notice being referred back to the submitting administration.

There is no method for indicating which spectrum mask is to be used by the transmitters that will implement the allotment. This implies that the characteristics of the non-critical mask will be used for compatibility calculations involving DVB-T; in the case of T-DAB the various spectrum mask characteristics cannot be taken into account, as there are no relevant differences in the protection ratio values.

9. If Assignments are Appropriate

The interference potential of an assignment will be calculated on the basis of the assignment’s actual characteristics (antenna height, ERP, antenna radiation pattern etc).

An assignment’s susceptibility to interference will be calculated on the basis of protecting the specified reception conditions at the edge of the service area. The service area is calculated by the ITU on the basis of the assignment’s characteristics where the wanted field strength is 3 dB above that required for noise-limited coverage. It cannot be specified by the administration in its input requirement unless the assignment is associated with an allotment requirement (this can be done using the field 'Optional ID of the allotment of which the assignment is part', see below).

An assignment requirement is notified in a DT1 notice (for DVB-T) or a DS1 notice (for T-DAB).

Each assignment requires:

- The site name
- The longitude and latitude of the site
- The altitude of the site
- Either:
  - RPC which is mandatory for T-DAB assignments; or
  - System variant and reception mode to be used in planning (only for DVB-T)
- The polarisation to be used (can be “U” – unspecified, in which case no polarisation discrimination will be taken into account by the calculations done during the planning process)
- The maximum ERP of either the horizontal or vertical component (or both)
- Optional ID of the allotment of which the assignment is part
- Optional ID of the SFN of which assignment is part, and the relative timing within the SFN
- Antenna height above ground

- Antenna directivity information – antenna radiation pattern at 10 degree steps if not omni-directional
- Maximum effective height, and 36 values of effective height in 10 degree steps
- Which of the spectrum masks defined by RRC-04 is to be used
- If applicable, data about the analogue assignment being converted into the digital assignment
- If required, an indication of acceptable channels from which one could be allocated (for DVB-T), or acceptable frequency blocks (for T-DAB)
- Optional remarks
- Optionally, one or more administrations with which the requirement has been "pre-co-ordinated".

10. Reference Planning Configuration OR System Variant and other planning parameters

In the cases where an administration already knows which system variant (and other planning information such as the reception type) will be used for a given requirement, it can provide this as part of the requirement specification in the form BT1 or BT2. Where the relevant decisions have not yet been taken, the administration can specify a Reference Planning Configuration (RPC). In the case of T-DAB, it is not possible to specify anything other than an RPC.

11. Reference Planning Configurations (RPCs)

Choice of an appropriate combination of RPC and RN may be central to defining the nature of an allotment requirement and is important to ensure that the compatibility calculations are neither too restrictive nor too lenient. Assignment requirements may need a suitable RPC to be selected.

The RRC Report defines a Reference Planning Configuration as "An RPC is a representative combination of criteria and parameters to be used for frequency planning purposes." While undoubtedly accurate, this description manages to ignore the principal use of an RPC, which is that the criteria and parameters specified are sufficient to calculate a system's susceptibility to interference. It also recognises that different systems with similar but not identical properties can be grouped together for planning purposes into "families" which can be treated as one.

Three RPCs are defined by the RRC for DVB-T and two for T-DAB. For DVB-T, it is also possible under RRC rules to specify a system variant and reception conditions. DVB-H could be specified in this way. For T-DAB, one of the two defined RPCs must be used.

ECC Report 49 gives much background on RPCs and shows the actual combinations of systems that were used to derive the RPCs used by the RRC. In brief, they can be summarised as follows:

For DVB-T:

TABLE 1: Reference planning configurations for DVB-T

Reference planning configuration	RPC 1	RPC 2	RPC 3
Reference location probability	95%	95%	95%
Reference *C/N* (dB)	21	19	17
Reference $(E_{med})_{ref}$ (dBµV/m) at 200 MHz	50	67	76
Reference $(E_{med})_{ref}$ (dBµV/m) at 650 MHz	56	78	88

$(E_{med})_{ref}$: minimum median equivalent field strength

RPC 1: reference planning configuration for fixed roof-level reception

RPC 2: reference planning configuration for portable outdoor reception or lower coverage quality portable indoor reception or mobile reception

RPC 3: reference planning configuration for higher coverage quality for portable indoor reception.

From Table 1 it can be seen that each RPC has different requirements in terms of field strength and therefore, in general, also in terms of transmitter power. As a result, each RPC has different features in terms of constraints imposed to its neighbours to request protection and in terms of network costs. Table 2 below summarises the comparison between the different RPCs.

TABLE 2: Comparison of RPCs for DVB-T

	RPC1	RPC2	RPC3
Field strength requirement	The lowest	The medium	The highest
Protection constraint imposed to neighbours	The highest	The medium	The lowest
Maximum allowable field strength for your neighbours to protect your network	The lowest	The medium	The highest
Protection given to your neighbour	The highest	The medium	The lowest
Network cost	The lowest	The medium	The highest*

NOTE *: Portable indoor reception may imply additional network costs for EBU members because dense networks will be needed to deliver the required high field strength values.

From Table 2, we can see that if one country plans at the RRC for RPC1:

- It will create less interference to its neighbours compared to other RPCs;
- It will impose the highest protection constraints its neighbours so it will limit its neighbours plans; the neighbouring countries will have more difficulties to implement high field strength networks;
- but it will have much less flexibility in the future to implement a network which requires higher field strengths (as for example DVB-H).

If one country plans at the RRC for RPC3:

- It will create more interference to its neighbours compared to other RPCs;
- It will impose the lowest protection constraints on its neighbours so they will also be able to use quite high field strengths;
- it will be able to implement networks which require high field strengths (for example DVB-H), you have more flexibility for the future;
- if RPC1 is implemented instead of RPC3 because of network cost or whatever other reason, fixed reception will not be protected especially near the country borders because planning for RPC3 has allowed the neighbouring countries to transmit high field strengths.

The conditions for the use of RPC2 are somewhere between those for RPC1 and RPC3. It should be noted that because of the way in which RPC2 has been defined, it primarily represents outdoor portable reception.

For T-DAB:

TABLE 3: Reference planning configurations for T-DAB

Reference planning Configuration	RPC 4	RPC 5
Location probability	99%	95%
Reference C/N (dB)	15	15
Reference $(E_{med})_{ref}$ (dBµV/m) at 200 MHz	60	66

$(E_{med})_{ref}$: minimum median equivalent field strength

RPC 4: reference planning configuration for mobile reception

RPC 5: reference planning configuration for portable indoor reception.

The structure of the Reference Networks designed for RPC4 and RPC5 are based on the same architecture and the only difference is on the power budget that is 9 dB higher in the case of RPC5 due to:

- building penetration loss in the case of portable indoor reception,
- different percentage of location to achieve (95 instead of 99)

The combination of previous elements leads, in the case of RPC5, to an increase of the field strength requirement as maximum allowable interfering field strength, and a reduction of the protection constraint imposed to neighbours and protection given to them.

It is likely that none of the RPCs exactly matches the system characteristics of a particular DVB-T system that an input requirement will use. In this case, the administration in question has to consider whether to use the nearest match available, or to explicitly state the system variants and reception conditions that will be used. In practice, the range of conditions covered by the RPCs should be wide enough that no system is too far removed from them. Administrations should consider whether the resulting few dB are worth the trouble of specifying a particular system variant and reception condition.

12. Reference Networks (RNs)

RNs are used to represent interference potential from a network when the actual characteristics of that network are not yet known. They are therefore particularly suitable when considering allotment planning, as they allow for flexibility in implementation.

The RRC definition of an RN is "A generic network structure representing a real network, as yet unknown, for the purposes of a compatibility analysis. The main purpose is to determine the potential for and susceptibility to interference of typical digital broadcasting networks." The EBU considers that the phrase "and susceptibility to" should not be present.

Reference networks are idealised representations of real network implementations. They exhibit a high degree of geometrical symmetry and homogeneity with regard to transmitter characteristics, but they do not represent actual network implementations.

The RRC defined four RNs for DVB-T and two variants of an RN for T-DAB. The choice of which to use is left to the administration making the input.

For background information on RNs see ECC Report 49. This formed the basis, in the RRC, for the definitions of RNs that can be used (see Annex A3.7 to Chapter 3 of the RRC-04 Report for details).

The following two questions may arise when preparing input requirements as allotments:

1. "I have an allotment, and also wish to specify one or more assignments which will be used as part of that allotment. How will the calculations for these be made?"

- It seems that this case is not yet clarified in detail in the RRC procedures.

The following approach would be desirable: The interference potentials caused both by the RN and by the assignments will be calculated. Whichever of them is the greater in any particular set of circumstances will be used when assessing compatibility.

2. "I have an area to be covered and already know the set of assignments which will be used in an SFN to provide the coverage in that area. Do I need to specify this area in the form of an allotment?

- If ALL the assignments that will ever be required are known, it may be worthwhile not specifying the allotment as well as the assignments. In that case it is recommended to submit only the set of assignments and to ensure that they all have the same SFN identifier.

13. Protection of Existing Assignments/Allotments

The RRC-04 agreed that Administrations should indicate those existing and planned assignments that are not to be taken into the planning process. If no information is submitted, all the assignments included as indicated below by 31 October 2005 (Reference situation date) will be considered in the planning process. Existing and planned assignments and allotments are defined in the RRC-04 report as follows:

– *analogue and digital[1,2] assignments contained in the ST61 and/or GE89 Plans on 31 October 2005;*

– *analogue and digital[1,2] assignments successfully co-ordinated under the procedures of Article 4 of the ST61 and/or GE89 Agreements by 31 October 2005;*

– *T-DAB allotments and assignments successfully co-ordinated by 31 October 2005 with all administrations affected, the territories of which are inside the RRC planning area[1,2];*

1 These digital assignments and allotments shall not be given more protection than other digital and analogue entries in the new plan.

2 The criteria to be used for co-ordination of T-DAB with respect to other analogue and digital assignments and allotments of the broadcasting service and assignments of the other primary services are contained in §A.1.2.2 of the report. In this regard, these criteria are to be applied provisionally as part of Article 4 procedures of the ST61 and GE89 Agreements.

– *assignments recorded in the Master International Frequency Register (MIFR) by 31 December 1989 with a favourable finding with respect to the applicable provisions of the Radio Regulations, and without complaint of harmful interference received by the Radiocommunication Bureau;*

– *analogue broadcasting assignments to be submitted to the Radiocommunication Bureau by Iraq within three months after the end of the first session of the conference under the procedure and conditions mentioned [**in the RRC-04 Report**].*

13.1 Protection of Existing Analogue Assignments/Allotments

The term "protection of existing and planned analogue assignments" refers to two important aspects in the context of the RRC-06:

- the design of the digital plan;
- the implementation of stations in the digital plan.

The implementation aspect is reflected by the fact that the RRC-06 is required to produce a digital plan which is to protect existing and planned analogue assignments in the transition period. This protection will be ensured by procedures to be given by the RRC-06 as described in section 7.4 of the RRC-04 report (see the Annex for definitions and interpretations).

On the other hand, when the digital plan itself is established, analogue assignments have to be taken into account according to the wishes of administrations. Basically, there are two relevant approaches which are described in section 5.1.5.3 of the RRC-04 report.

APPROACH 1: Existing and planned analogue television assignments are taken into account in the design of the new digital plan.

As a consequence, these analogue assignments will automatically be compatible with the new digital plan and hence are protected in the new digital plan up to the end of the transition period.

Possible effects:

- fewer implementation problems during the transition period;
- fully compatible digital requirements can be implemented immediately after the new agreement comes into force when the concerned administration desires;
- if all existing and planned analogue television assignments are taken into account in the design of the digital plan a sub-optimal digital plan may result because there will be less spectrum available for the digital plan.

APPROACH 2: Existing and planned analogue television assignments are not taken into account in the design of the new digital plan.

As pointed out in section 7.4 of the RRC-04 report, existing and planned analogue assignments will be protected by the application of appropriate procedures in the implementation of the new plan up to the end of the transition period. If these analogue assignments are not taken into account in the design of the plan, it is very likely many of them will not be compatible with the new digital plan.

Possible effects:

- a near optimal digital plan could be realised (more digital requirements accommodated);
- the new digital plan may not be fully operable until the relevant existing and planned analogue assignments have been switched-off or until the end of the transition period.

It has to be emphasised that it is not requested from an administration to apply exclusively either Approach 1 or Approach 2 to all its requirements as a whole. Rather, this choice can be taken on a case-by-case basis, i.e. the choice is open for an administration with regard to an individual analogue assignment whether or not to include it in the list of assignments not to be taken into account. However, if an administration does not make any statement to the contrary all its existing and planned analogue assignments will be taken into account in the design of the digital plan.

13.1.1 Mutual impact between approaches

If different approaches are employed by neighbouring administrations then they should be aware of the consequences.

The administration which applies Approach 1

- would be able to get more requirements into the plan along the border with the administration applying Approach 2 compared to the case when Approach 1 would be applied on both sides. Therefore the Approach 1 administration benefits directly from the application of Approach 2 by its neighbour;

The administration which applies Approach 2

- would generally get less requirements into the plan along the border with the administration applying Approach 1 compared to the case when Approach 2 would be applied on both sides. Therefore the Approach 2 administration may suffer directly from the application of Approach 1 by its neighbour,

If both administrations apply the same Approach to the requirements which are in the common border area, it is more likely that an equitable result will be obtained.

13.1.2 Considerations for EBU members

Regarding the establishment of the new digital plan it is expected that within EBU members' countries both Approaches 1 and 2 may be applied and it is not possible to recommend the use of either Approach exclusively. However, it is to be noted that many EBU members consider that Approach 2 offers significant advantages in terms of the spectrum utilisation that could be achieved by the digital plan.

In any case, EBU members should request their administrations to take the following positions when preparing their requirements and, in the transition period, when implementing the digital plan:

1. Following Resolution *COM 5/1 (Note 1)* administrations should notify the ITU which of their existing and planned analogue assignments do not need to be taken into account in the design of the new digital plan.
2. In any case, administrations should be encouraged to relax the constraints on the new digital requirements as far as possible and as early as possible by means of active co-operation (e.g. bilateral agreements, etc.).
3. In order to facilitate the rapid introduction of the digital plan, administrations should, in general, neither bring planned analogue television assignments into operation, nor introduce new analogue assignments during the transition period. However, new analogue assignments may be acceptable if they facilitate the introduction of digital requirements.
4. Administrations are encouraged to 'switch-off' existing analogue television stations as early as convenient before the end of the transition period, and suppress the corresponding analogue television assignment in ST61 or GE89.

13.2 Planning process

The term “planning process”, even though employed frequently throughout the entire RRC-04 report, is not explicitly defined in the report in terms of what detailed activities are covered by this process.

Basically, four different phases of the planning process can be identified. These are

a) compatibility analyses,

b) incorporation of administrative declarations,

c) synthesis of a new digital frequency plan and

d) a final compatibility analysis as described in section 5.3.1.1.5 of the RRC-04 report.

The notifications by administrations of which of their existing and planned analogue assignments are not to be taken into account in the design of the plan have a direct impact on the steps a) – c).

Step d) is not related to the generation of the new frequency plan. It is related to the identification of what coverage is achieved by the plan and can include the identification of those existing and planned analogue assignments which are not protected by the digital plan but are to be protected by means of application of the procedures for the implementation of the digital plan. This information can thus also identify those digital requirements which may be subject to implementation constraints.

The difference between the two approaches to deal with the existing and planned analogue assignments is that in Approach 1 the protection of analogue assignments is taken into account during the compatibility analyses which precede a synthesis and this ensures that the digital plan which results from the synthesis automatically ensures that protection.

In Approach 2, however, in order to ensure that the protection of analogue assignments does not act as a constraint on the digital plan, the analogue assignments are not taken into account during the compatibility analyses which lead to a synthesis. It follows that the synthesis does not take them into account either. Thus the digital plan will not necessarily be compatible with many of the existing and planned analogue assignments.

13.3 Protection of Existing Digital Assignments/Allotments

In some European countries, operational and commercial DVB-T transmissions have already started. Since ST61 and GE89 procedures allow for such a use of the bands, there are existing DVB-T assignments in the ST61 and GE89 plans. Concerning existing and planned T-DAB allotments, which are entries in the Wi95revMa02 plan, the ITU BR has not registered them because the ST61 procedures do not allow for such a use.

The following two cases can be identified regarding existing and planned digital assignments/allotments:

a) existing and planned digital assignments/allotments intended to enter into the new digital plan

b) existing and planned digital assignments/allotments not intended to enter into the new digital plan, but required to continue to operate for a part or all of the transition period.

In the first case (see a) above) these existing and planned digital assignments/allotments shall be submitted as requirements to the RRC-06 planning process, with the indication with which administrations they have been co-ordinated. In the planning process, they will be treated in the same manner as the other digital broadcasting requirements.

If they are successful, i.e. they enter into the new digital plan unchanged, they remain as compatible as they currently are with the existing analogue assignments that appear in the ST61 and GE89 plans.

If they are not successful in the planning process, including taking account of administrative declarations, they will presumably be included in the list of unresolved cases, together with other unsuccessful requirements, to be resolved by means of bi- and multilateral co-ordination within a limited time period after the conference. It was a practice at some previous planning conferences that such a list is attached to the final acts.

In the second case (see b) above) it is unclear from the RRC-04 report how these existing and planned digital assignments/allotments are to be taken into account in the planning process. According to the definition given in §1.7.1 footnote 1, these digital assignments and allotments shall not be given more protection than other digital and analogue entries in the new plan.

However, the RRC-04 report does not make specific provisions for these existing and planned digital assignments/allotments to be protected during the transition period. Therefore the EBU members should advise their administrations to seek compatibility by means of bilateral or multilateral agreements, preferably in the pre-co-ordination phase before the RRC-06.

In summary, it is recommended that the EBU members should advise their administrations:

- to submit, as far as appropriate, the existing and planned digital assignments/ allotments as requirements for the new digital plan.
- to seek protection during the transition period for the existing and planned digital assignments/ allotments that will not enter into the new digital plan, by means of bilateral or multilateral agreements.

14. Other Services

If an administration submits other primary services to be protected, these may create many constraints on the digital requirements. It is recommended that EBU members urge their administrations to solve this, as far as possible, by co-ordination agreements.

15. Resolution of ambiguities

RRC-04 put into place three groups to deal with inter-sessional activities.

- Regulatory Procedural Group (RPG)
- Inter-sessional Planning Group (IPG)
- Planning Experts Team (PXT)

If EBU members identify ambiguities or uncertainties, they are urged to raise this with their administrations or with the EBU, with a possible view to bringing the matter to the attention of and, if appropriate, making a proposal to the relevant ITU groups for resolution.

Annex
Definitions/interpretations related to existing and planned analogue assignments

A) 'Definitions'/interpretations:

A.1 "establishment of the plans"

This is considered to mean **(§ 7.2** of the RRC-04 report) the planning process carried out during RRC-06 (the 5 week period in May/June 2006) resulting, at the end, in

A.1.1 the "**digital plan**" containing "existing and planned assignments and allotments, as defined in § 1.7 of this report, in addition to the assignments and allotments proposed by administrations and approved by the conference at its second session" and in

A.1.2 the "**analogue plan**" containing "existing and planned analogue assignments as defined in § 1.7 of this report."

Note 1: *The treatment during the transition period of existing and planned digital assignments that should not enter into the digital plan is not clear. This issue must be discussed further. It is assumed that in A.1.1, the references to "assignments and allotments" relates to digital assignments and allotments.*

A.2 "synthesis of the digital plan"

"Synthesis" describes the process by which digital requirements are assigned frequencies by the computer (or otherwise) during the establishment of the plans, taking into account, or not, the protection to be afforded to the existing and planned analogue TV services by the digital requirements.

A.3 "implementation of the plans"

This is considered to mean the bringing into service of the new digital requirements contained in the digital plan.

A.4 "the transition period"

"This period starts at the date of entry into force of the new agreement and ends on a date to be agreed by the second session of the conference." (§ 7.4)

During the transition period "the existing and planned analogue assignments will continue to be used and protected by the new digital plan." (§ 7.4)

After the end of the transition period "analogue assignments may continue to be used provided that

protection is afforded to the new digital plan and its modifications; and

no protection is claimed from the new digital plan and its modifications." (§ 7.4)

Note 2: *The "analogue switch-off" date is not necessarily the end of the transition period; administrations may chose to end ("switch-off") analogue TV transmissions before that final deadline.*

A.5 "compatibility during the transition period"

See text in "7.5.4.1.1", below.

B) Other relevant Report texts:

§ 5.1.5.1

"... - In order to facilitate the planning process, administrations are encouraged to state which of their existing and planned assignments defined in §1.7 they would like to be protected

in the establishment of the plan and/or

in the implementation of the plans in the transition period..."

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"Administrations shall indicate those existing and planned broadcasting assignments/allotments that are not to be taken into account in the planning process; ..."

> **Note 3**: *it seems from 5.1.5.1 that administrations must indicate their analogue television assignments which they wish to have protected, whereas Res. Com 5/1 says the opposite, i.e. that administrations must indicate their analogue services that they don't wish to have protected. The ITU has in the meantime decided that the latter method is to be used (see ITU CL217,§7).*
>
> **Note 4**: *it seems that the following possibilities are available: existing and planned analogue television assignments are protected:*
>
> *(a) during the transition period but not in the synthesis of the plan*
>
> *(b) in the synthesis of the plan and during the transition period*
>
> *(c) not at all*
>
> *It is thought that most administrations may follow either possibility (a) or (b); some may follow possibility (c).*

§ 5.1.5.1

"... - Administrations are encouraged, as part of the planning process, to agree, on a bilateral and multilateral basis, the mutual compatibility between the input requirements of digital terrestrial broadcasting services **and the compatibility between those input requirements and other assignments and services**. Such agreements need to be notified to the ITU Radiocommunication Bureau in order to assist the planning process..."

> **Note 5**: *It seems that the ITU is to be notified of agreements before October 31, 2005, in order to be used in synthesising the first draft plan. How is this to be done? One possibility is to make the compatibility calculations in the normal way and then to take account of the 'co-ordination' information when preparing the files which are needed for the synthesis process. This means that it is only at that stage that what has been calculated is ignored if the interfered with or interfering station belongs to one of the administrations in the co-ordination list. By ignoring the results in such a case, the process makes the assumption that there is no incompatibility to be taken into account and there is thus no impact on the set of available channels nor is there any mutual incompatibility between digital requirements. An alternative approach would be to consider that all such agreements should relate only to individual requirements and their mutual compatibility or their compatibility with assignments of existing or planned analogue and Other Services.*

§ 5.1.5.3

"One approach is to ensure compatibility between the new digital plan and existing and planned assignments/allotments in the design of the new plan, without the need for any procedures at the stage of implementation of the new plan. This approach, however, results in non-optimum use of spectrum, hence less capacity available per country for satisfying its future digital requirements."

"Another approach, by which spectrum efficiency may be maximised, is not to take into account existing and planned assignments/allotments in the design of the plan, but to ensure compatibility between them and the new plan at the stage of implementation of the new plan by the application of appropriate procedures (see Chapter 7). In this approach, it is likely that many assignments in the new plan could not be brought into service without restrictions before the end of the transition period."

§ 7.5.4.1.1

"Specific procedures for co-ordinating an assignment / allotment in one of the plans with existing and planned broadcasting assignments during the transition period

Compatibility of some assignments/allotments in one of the plans with existing and planned broadcasting assignments during the transition period may need to be ensured after the second session of the conference by the application of a specific procedure[3]. This could be implemented by specifying, under a specific section of the new agreement, that before an assignment in one of the plans, or an assignment obtained by conversion of an allotment in the digital plan, is brought into service, co-ordination is to be effected with the existing and planned

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"[3] This may be the case, in particular, between countries wishing to implement different planning approaches"

digital or analogue assignments in the relevant plans which may be affected. In the application of this specific procedure, equitable access to frequency resources should be preserved."

§ 1.7.1

"Existing and planned assignments and allotments of the broadcasting service

Existing and planned assignments and allotments of the broadcasting service are defined as follows.

– For the territories covered by the ST61 or the GE89 Agreements, or both:
  – analogue and digital[1,2] assignments contained in the ST61 and/or GE89 Plans on 31 October 2005;
  – analogue and digital[1,2] assignments successfully co-ordinated under the procedures of Article 4 of the ST61 and/or GE89 Agreements by 31 October 2005;
  – T-DAB allotments and assignments successfully co-ordinated by 31 October 2005 with all administrations affected, the territories of which are inside the RRC planning area[1,2];
  – assignments recorded in the Master International Frequency Register (MIFR) by 31 December 1989 with a favourable finding with respect to the applicable provisions of the Radio Regulations, and without complaint of harmful interference received by the Radiocommunication Bureau;
  – analogue broadcasting assignments to be submitted to the Radiocommunication Bureau by Iraq within three months after the end of the first session of the conference under the procedure and conditions mentioned in Note 4 below.
  – For the territories not covered by the ST61 or the GE89 Agreements:
  – analogue and digital[2] assignments successfully co-ordinated by 31 October 2005 with all administrations concerned belonging to the RRC planning area;
  – assignments contained in the "RCC List"[3] successfully co-ordinated by 31 October 2005 with all affected[4] administrations, the territories of which are inside the RRC planning area.

NOTE 1: Equitable access needs to be considered when taking into account existing and planned assignments of the broadcasting service.

NOTE 2: In order to avoid undue constraints on the planning, there may be a need to encourage administrations to remove unnecessary entries from the plans.

NOTE 3: It is to be noted that in Morocco, pursuant to RR No. 5.229, the band 162-230 MHz is allocated to the broadcasting service. Since channel M5 (170-177 MHz) is both concerned by the planning of this conference and outside the bands dealt with by the conference, it may require particular consideration in the planning.

NOTE 4:

1) Iraq will submit by 28 August 2004 a list of its analogue broadcasting assignments to the Radiocommunication Bureau and other administrations concerned. The Radiocommunication Bureau will examine this list by applying the relevant procedures of the GE89 and the ST61 Agreements, identify the assignments of other administrations in the planning areas that are likely to be affected and send the results to the administrations concerned before the first planning exercise.

"[1] These digital assignments and allotments shall not be given more protection than other digital and analogue entries in the new plan."

"[2] The criteria to be used for co-ordination of T-DAB with respect to other analogue and digital assignments and allotments of the broadcasting service and assignments of the other primary services are contained in §A.1.2.2 of the report. In this regard, these criteria are to be applied provisionally as part of Article 4 procedures of the ST61 and GE89 Agreements."

"[3] This "list" of frequency assignments to television broadcasting stations has been produced by the countries in the extended planning area defined in Council Resolution 1185 (modified, 2003) and set out in the annex to Circular Letter CR/209."

"[4] The criteria to be used for co-ordination of the broadcasting assignments in the "RCC List" with respect to existing and planned analogue and digital assignments and allotments of the broadcasting service and existing and planned assignments of other primary services are contained in §A.1.2.4 of the report. These criteria are to be used by the Radiocommunication Bureau to ensure that co-ordination with all affected administrations has been successfully completed."

2) Iraq and the administrations concerned will make every possible effort to co-ordinate these assignments, in accordance with the provisions of the GE89 and the ST61 Agreements, as appropriate, taking into consideration the special situation of Iraq and allowing the Iraqi case to be tested before the finalisation of the first planning exercise.

3) The assignments contained in the above-mentioned list will be taken into account in the planning exercise that will be performed in the intersessional period.

4) Those assignments in the list referred to above which are successfully co-ordinated with all administrations concerned, following step 2 above, will continue to be considered in the production of the draft plan. The uncoordinated assignments will be submitted to the second session of the conference for consideration and further action, as appropriate."

§ 5.3.1.1.5

"Analysis of final plan(s)

The approach given in § 5.3.1.2.4 will be used to calculate the position of the test points delineating the service area of all assignments in the final plan(s), noting that it is necessary to calculate protection margins instead of wanted field strength in order to take interference into account. For allotments, the analysis will consist of calculating the protection margins for the test point locations specified by the administration concerned."