

Workshop on Frequency management for mobile broadcasting and IP datacasting in Europe, Copenhagen 27 September 2005.

The ITU RRC-06 and European policies for planning

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Regulatory framework for use of Band III, IV and V

After more than 6 years of preparations, the RRC-06 will start on the 15th of May 2006. This ITU Regional Radio Conference has the task to make an Agreement and associated frequency plan for digital broadcasting in bands III (174-230 MHz) and IV/V (470-862 MHz) for 120 countries in Europe, Africa and the Middle East. The new plan will replace parts of the Stockholm Agreement of 1961 for the European Broadcasting Area and parts of the Geneva Agreement of 1989 for the African Broadcasting Area. The new agreement will contain a plan for T-DAB and DVB-T in Band III and DVB-T in Band IV/V and a plan consisting of existing and planned analogue TV stations. The latter plan will cease to exist after a transition period. Until that time analogue TV stations need to be protected. This will likely result in temporary restrictions of the entries in the plan for digital broadcasting.

The new agreement will regulate the use of Band III, IV and V in Europe for decades and is therefore of great importance for all future applications in these bands, including mobile broadcasting. Mobile broadcasting in these bands using the T-DAB, DVB-T, DVB-H, DMB or other not yet known standards can only operate under the “mask” of entries in the plan for digital broadcasting. Input requirements to RRC-06 should be specified in such a way that the resulting entries in the plan enable the future use. In case of mobile broadcasting this means a rugged system variant and a high field strength.

RRC-06 challenges

The CEPT has set up Working Group RRC-06 to prepare the Conference. The objective of CEPT is to meet its digital broadcasting requirements whilst gaining maximum flexibility for the future use of the spectrum. CEPT wants to achieve this by:

- as far as possible, pre-coordinated input requirements; European countries undertake multilateral negotiations in 14 regional groups to harmonise their inputs to RRC-06
- submission of European Common Proposals (ECP) for the text of the new agreement, including provisions for future flexible use.

The first ITU conference dealing with broadcasting took place in 1929. Since then several conferences have been held for planning of broadcasting in LF/MF, HF, VHF, UHF and satellite broadcasting in the 12 GHz. Not all conferences have been successful in every aspect and conferences for planning of shortwave broadcasting even failed to make a plan. In preparing for RRC-06 it is therefore important to identify elements that contribute to success and failure.

Some of the elements for success are:

- Equitable access; because of the numerous system and reception variants, different propagation conditions and other services, this can only be determined on a bilateral basis

- Timely access to the bands and therefore a short transition period. Some countries in the planning area are in favor of a transition period of 30 years, contrary to that is the EC working on a Communication in which analogue switch off is indicated in 2012.
- Quality of reception; if too many stations are accepted in the plan, interference levels are too high and the expected coverage will not be achieved.
- Flexible and future proof; the new agreement should contain procedures that are easy to implement for modifications to the plan and for implementation of new services and technologies.

Some of the elements for failure are:

- Excessive number of requirements. The first planning exercise for RRC-6 showed that in some areas the capacity of the band is exceeded by a factor of about 6; reduction of requirements to reasonable numbers is needed.
- Political issues; the Stockholm conference in 1961 almost failed because of the Berlin issue. Also nowadays there are many political tensions in parts of the planning area. Informal meetings between the regional organisations take place before and during RRC-06 to prevent escalation of political issues at the conference.
- Insufficient time; the 5 week duration of the conference will not be enough to solve all problems. Pre-coordination of input requirements is essential.

Mobile broadcasting needs fulfilled by RRC-06?

ITU, CEPT and EBU have committed themselves to make RRC-06 a success. But a successful conference does not necessarily mean that mobile broadcasting can be implemented without constraints. Before implementing mobile broadcasting applications it needs to be proven that the interference potential of the plan entries is not exceeded. However, at present no internationally agreed planning criteria for DVB-H are available. Within the limits of radiated power and field strength given by the plan, it may not be possible to achieve the required field strength for mobile broadcasting reception everywhere within the expected coverage area due to poor receiving antenna characteristics. In addition there will be restrictions during the transition period and for DVB-H in combination with GSM900, only 60 % of Band IV/V is suitable.

It should also be noted that many more applications are foreseen in Band III, IV and V. Besides DVB-T for different usage (among others HDTV), in some countries existing mobile, fixed and radio navigation services need to be protected. Moreover services ancillary to broadcasting (wireless microphones, talk back links) need to continue and extended. Although RRC-06 is not dealing with it, broadcasting ancillary services will be planned on a national basis. Furthermore there is some interest to use part of Band IV/V for IMT2000 and systems beyond. Another ITU Conference, WRC-07, will deal with spectrum for these services and it is premature to consider this until the outcome of the RRC-06 is known.

The needs for mobile broadcasting will probably not be fulfilled by the RRC-06. In addition to band IV/V more frequency bands need to be identified for mobile broadcasting such as Band III, 1.5 GHz band (in CEPT countries planned for T-DAB) and non-broadcasting bands. Broadcasters and telecommunications companies should cooperate in finding solutions for multimedia services to mobiles rather than to seek unnecessary confrontation in spectrum claims.

Copenhagen, 27 September 2005

**Frequency Management for Mobile
Broadcasting and IP Datacast in Europe**

**The ITU RRC-06
and European policies for planning**

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The ITU RRC-06 and European Policies for Planning

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Regulatory framework for use of
Band III, IV and V

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RRC-06 challenges

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Will results of RRC-06 fulfil the needs for
mobile broadcasting?

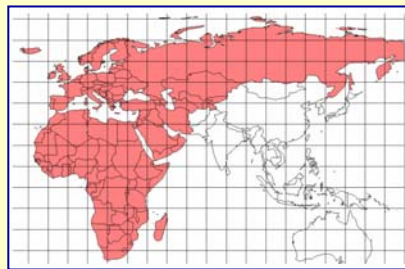
Regulatory Framework for Use of Band III, IV and V

RRC-06 mandate

- Planning of the digital terrestrial broadcasting service
- In the frequency bands:
 - 174-230 MHz (Band III)
 - 470-862 MHz (Band IV/V)

Replacing parts of current agreements:
Stockholm 1961
Geneva 1989

The planning area



120 administrations in planning area

Very different broadcasting policies and time scales

The impact

- New agreement will regulate use of Band III, IV and V for decades
 - Including mobile broadcasting

Mobile broadcasting to operate under the “mask” of the plan entries

Expected Outcome of RRC-06

<p>Agreement text</p>	<ul style="list-style-type: none"> ➤ Execution of agreement ➤ Duration of transition period ➤ Procedures for modification of the plans ➤ Notification of operational stations 	<p>Two option for end of transition:</p> <ul style="list-style-type: none"> • <2015 • 2028-2038 	
<p>Annexes</p>	<p>Digital broadcasting plan</p> <ul style="list-style-type: none"> • Band III: T-DAB & DVB-T • Band IV/V: DVB-T 	<p>Analogue TV plan</p> <ul style="list-style-type: none"> • stations as notified by 31/10/2005 	<p>Analogue TV plan will cease after the transition period</p>
<ul style="list-style-type: none"> ➤ Technical criteria ➤ Characteristics to be submitted for modification of the plans ➤ Limits for determining when agreement with other administrations is needed in case of modifications 			

RRC-06 Challenges

Overall CEPT objective

- To meet its digital broadcasting requirements
- Gaining maximum flexibility for the future use of the spectrum

Broadcasting and other potential advanced communication services

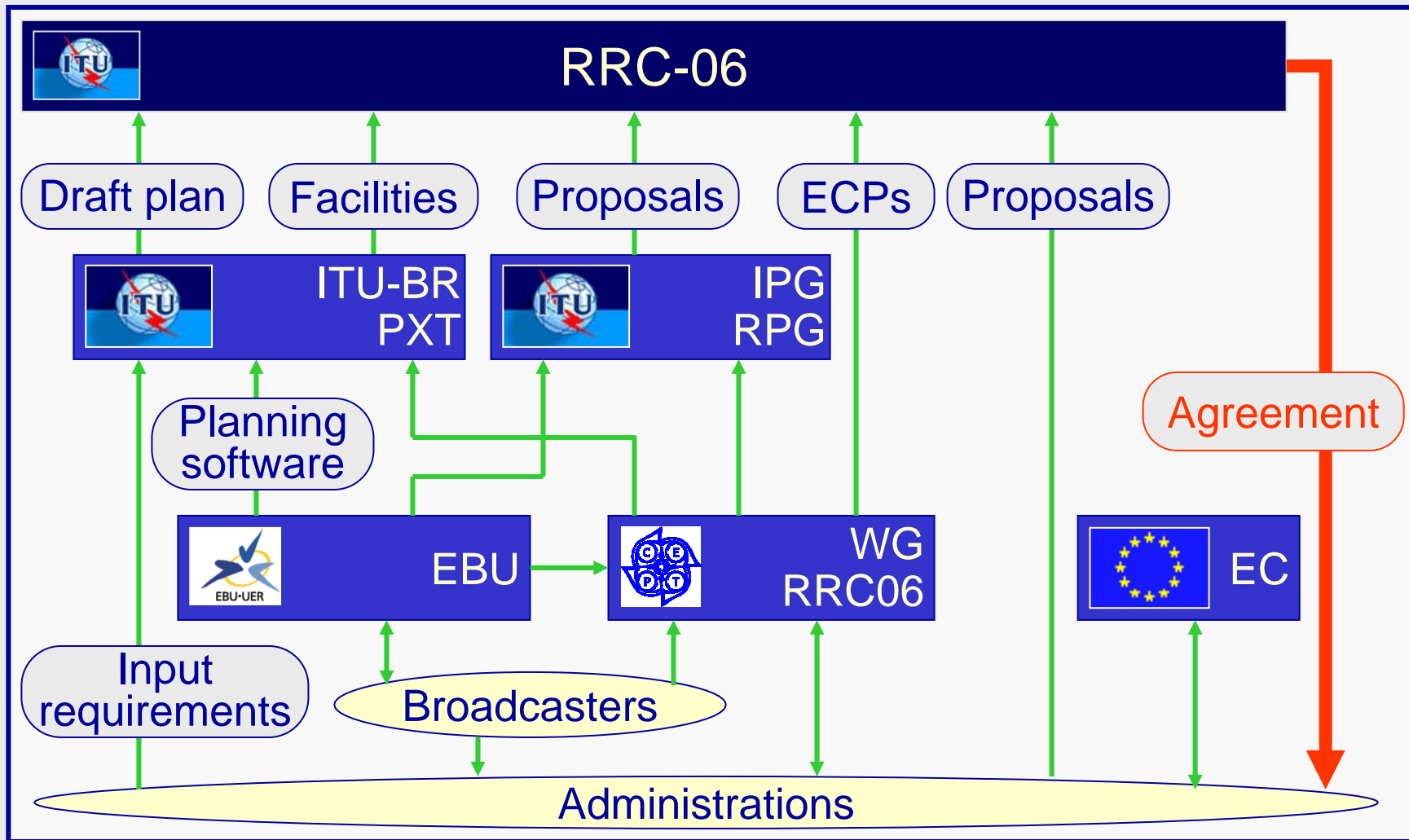
CEPT aim

- European Common Proposals (ECP)
 - Text of new agreement for digital broadcasting (GE06)
 - Technical annexes
 - Text of agreement for the revision of ST61
- To achieve, as far as possible, pre-coordinated input requirements

7 meeting of WG,
7 meetings of each of the 2 project teams,
Frequent meetings of 14 multilateral groups

Main Actors

and the communication routes



Elements for Success

Equitable access	Access to bands will differ from country to country depending on i.a.: <ul style="list-style-type: none">• reception mode and system variant• propagation conditions• other use of the bands	To be determined in bilateral negotiations
Timely access	Use of new digital plan is restricted because analogue TV needs to be protected during the transition period	Short transition period is essential
Quality of reception	Coverage obtained by plan entries should fulfil the expected reception quality goals	Interference levels should not be too high
Flexible and future proof	Need to modify, add and delete plan entries and to implement new technologies and services	Procedures that are easy to implement

Elements for Failure

Excessive number of input requirements	<p>Capacity in general</p> <ul style="list-style-type: none">➤ B III:1 DVB-T & 3 T-DAB “layers”➤ B IV/V: 6-7 DVB-T “layers”➤ Less in areas with extreme propagation conditions➤ Input of 1st planning exercise exceeded capacity of bands in some areas by ~ 6	<p>Reduction of input requirements needed.</p>
Political issues	<ul style="list-style-type: none">➤ ST61 nearly failed because of “Berlin issue”➤ Also nowadays political tension in parts of planning area	<p>Informal meetings between regional organisations to prevent escalation at conference</p>
Insufficient time	<ul style="list-style-type: none">➤ 5 weeks of RRC-06 will not be sufficient to solve all problems	<p>Pre-coordination of input requirements is essential</p>

Use of the New Digital Broadcasting Plan for DVB-H

Use of DVB-T entries in the plan	<ul style="list-style-type: none">➤ Plan entries should enable rugged system variant and high field strength (suitable “RPC”)➤ Associated coverage area should coincide with foreseen DVB-H usage	Administrations need to submit future proof input requirements
Convert allotment into assignments	<ul style="list-style-type: none">➤ Freedom in use of network structure<ul style="list-style-type: none">• Using SFNs• Not causing more interference than allowed by plan entry	RRC-06 must adopt adequate procedural text
Implement DVB-T entry as DVB-H	<ul style="list-style-type: none">➤ By means of “mask concept”➤ Compared to Plan entry<ul style="list-style-type: none">• Not causing more interference• Not claiming more protection	RRC-06 must adopt adequate procedural text.

Constrained Use of DVB-H

Planning criteria	<ul style="list-style-type: none">➤ At present no DVB-H planning criteria in ITU-R recommendations➤ WING TV project (Eureka 3187)<ul style="list-style-type: none">• Validating the DVB-H standard• Completion date June 2006	Internationally agreed planning criteria necessary
Reception conditions	<ul style="list-style-type: none">➤ Mobile/handheld equipment requires high field strength, because<ul style="list-style-type: none">• Small receiving antenna• High reception probability	Limitations in coverage and bitrate of DVB-H may need to be accepted
ERP limited	<ul style="list-style-type: none">➤ Transmitters for mobile/handheld reception require relative high power➤ ERP of network is limited by the plan	Dense networks may be needed

Mobile Broadcasting Needs Fulfilled by RRC-06 ?

Probably not !

Other broadcast applications

- Many DVB-T requirements for rooftop and indoor reception
 - including HDTV
- Services ancillary to broadcasting

Difficult to reduce capacity of existing DVB-T services

Other services

- Existing mobile, fixed or radio navigation services in some countries
- Some interest for IMT2000 and systems beyond

WRC-07 will deal with spectrum allocations for IMT2000

Restricted use of DVB-H in Band IV/V

- Restrictions until end of transition period
- Only 60% of Band IV/V suitable for DVB-H in combination with GSM900
 - Channel 21-49

For all applications the lower part of band IV/V is more attractive

Suggestions

Other frequency bands

- Additional frequency bands need to be identified:
 - Band III and L-band (1.5 GHz)
 - Non-broadcasting bands should not be excluded
- DVB project started to think of a “frequency agile” form of DVB-H

“Converged applications may use frequencies from various allocations” (WAPECS)

Co-operation

- Cooperation between Telcos and Broadcasters is the best path towards multimedia to mobile devices

Unnecessary confrontation in spectrum claims will be avoided