

**Agreement between Denmark and Germany
covering the Digital assignments and allotments
included in the Plan at RRC-06**

Background and problem:

During the development of the digital Plan agreed in Geneva at the RRC-06 a number of assignments and allotments were included in the Plan using conditional Administrative Declarations.

To enable the implementation of the assignments and allotments contained in the Plan for Denmark and Germany and at the same time ensure the future integrity it is necessary to agree on suitable fieldstrength limits.

1. General agreements

- Coordination between the administrations concerned is required, in case the maximum allowable field strength as indicated in chapter 2 (for UHF) and chapter 3 (for VHF) is exceeded by the cumulative interfering field strength of a real network implementation. The network implementation comprises all previously notified assignments as well as all newly notified assignments for the corresponding allotment.
- Field strengths are calculated at 10 meters height for 1% time, 50% of locations.
- The power sum method is used to calculate the cumulative interference field strength.
- The cumulative interference field strength is calculated at the boundary of the co-channel/co-block allotments.
- For field strength calculation, the propagation model according to the Geneva RRC-06 Agreement (modified ITU-R P. 1546) should be used. The parties noted that there are differences in the implementation of land-sea geographical data which could result in discrepancies in the calculated results. Preferably the land-sea data used at the RRC-06 should be used, if available.
- Assignments, that are situated within an allotment area, designated to transmit on the same channel as the allotment, but not linked to that allotment, will be treated in the implementation exactly like linked assignments in the RRC 06 planning process. Only the allotment area will be protected. The service area of these assignments outside of the allotment area are not protected.

2. UHF agreement

The maximum allowable interfering field strength $E_{\max \text{ int}}$ is defined as

$$E_{\max \text{ int}} = 49 + f_{\text{corr}} \text{ [dB}\mu\text{V/m]}$$

where f_{corr} is the frequency correction (in dB), given by $30 \cdot \log(f/650)$, f in MHz

Due to the protection of both Danish and German other services in channels 61 to 63 and 67 to 69 the implementation of these channels is restricted. The parties agreed to seek to find a solution on a case-by-case basis. Nevertheless, it is noted that there is an increased need for using these channels for broadcasting. It is expected that the frequency requirements in this band for other services will decrease.

3. VHF agreement

The maximum allowable interfering field strength $E_{\max \text{ int}}$ is defined as follows:

DVB-T interfered by 7 MHz DVB-T: $E_{\max \text{ int}} = 38 \text{ dB}\mu\text{V/m}$

DVB-T interfered by T-DAB: $E_{\max \text{ int}} = 33 \text{ dB}\mu\text{V/m}$

T-DAB interfered by T-DAB: $E_{\max \text{ int}} = 39 \text{ dB}\mu\text{V/m}$

T-DAB interfered by 7 MHz DVB-T: $E_{\max \text{ int}} = 45 \text{ dB}\mu\text{V/m}$

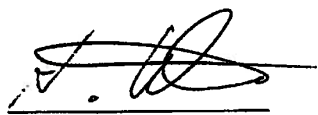
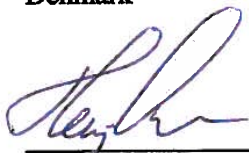
Two or more neighboring allotments using the same channel/block are treated as one allotment.

Geneva, 8th of June 2006

On behalf of the Administration of

Denmark

Germany



Henning Andersen

Andreas Werner

NITA

Bundesnetzagentur

Agreement between the Netherlands and Denmark related to administrative declarations and allotments agreed during RRC-06

Background

AFTALER
A number of co-channel exist between the allotments in the Plan for DVB-T and T-DAB in the Netherlands and Denmark. This agreement is covering both VHF band III and UHF band IV/V and is valid for conditional Administrative Declarations only.

The Agreement is as follows:

The administrations confirm that actual networks may be implemented as long as the cumulative interfering field strength on the boundary of any existing co-channel/co-block allotment does not exceed the maximum allowable interfering field strength $E_{\max \text{ int}}$, as given below:

VHF, DVB-T interfering DVB-T (RPC2):	$E_{\max \text{ int}} = 42 \text{ dB}\mu\text{V/m}$
VHF, DVB-T interfering T-DAB (RPC5)	$E_{\max \text{ int}} = 45 \text{ dB}\mu\text{V/m}$
VHF, single T-DAB block interfering DVB-T (RPC2)	$E_{\max \text{ int}} = 39 \text{ dB}\mu\text{V/m}$
VHF, T-DAB interfering T-DAB (RPC5):	$E_{\max \text{ int}} = 39 \text{ dB}\mu\text{V/m}$
UHF (RPC2/3):	$E_{\max \text{ int}} = 49 + f_{\text{corr}} \text{ [dB}\mu\text{V/m]}$

where f_{corr} is the frequency correction (in dB), given by $30 \cdot \log(f/650)$, f in MHz. Field strengths are calculated at 10 meters height for 1% time, 50% of locations and the power sum method is used to calculate the cumulative interference field strength

The propagation model to be used is ITU-R. 1546 - RRC06.

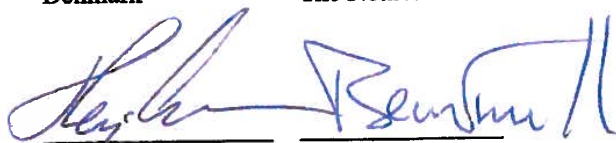
Coordination between the administrations concerned is required, in case the maximum allowable field strength as given above is exceeded by the cumulative interfering field strength of a real network implementation.

Geneva, 7th of June 2006

For the Administration of

Denmark

The Netherlands



Henning Andersen

Ben Smith

Agreement between Denmark and Poland
covering the Digital assignments and allotments
included in the Plan at RRC-06

AFTALER

Background and problem:

During the development of the digital Plan agreed in Geneva at the RRC-06 a number of assignments and allotments were included in the Plan using conditional Administrative Declarations.

To enable the implementation of the assignments and allotments contained in the Plan for Denmark and Poland and at the same time ensure the future integrity it is necessary to agree on suitable fieldstrength limits.

1. General agreements

- Coordination between the administrations concerned is required, in case the maximum allowable field strength as indicated in chapter 2 (for UHF) and chapter 3 (for VHF) is exceeded by the cumulative interfering field strength of a real network implementation. The network implementation comprises all previously notified assignments as well as all newly notified assignments for the corresponding allotment.
- Field strengths are calculated at 10 meters height for 1% time, 50% of locations.
- The power sum method is used to calculate the cumulative interference field strength.
- The cumulative interference field strength is calculated at the boundary of the co-channel/co-block allotments.
- For field strength calculation, the propagation model according to the Geneva RRC-06 Agreement (modified ITU-R P. 1546) should be used. The parties noted that there are differences in the implementation of land-sea geographical data which could result in discrepancies in the calculated results. Preferably the land-sea data used at the RRC-06 should be used, if available.
- Assignments, that are situated within an allotment area, designated to transmit on the same channel as the allotment, but not linked to that allotment, will be treated in the implementation exactly like linked assignments in the RRC 06 planning process. Only the allotment area will be protected. The service area of these assignments outside of the allotment area are not protected.

2. UHF agreement

The maximum allowable interfering field strength $E_{\max int}$ is defined as

$$E_{\max int} = 49 + f_{corr} \text{ [dB}\mu\text{V/m]}$$

where f_{corr} is the frequency correction (in dB), given by $30 \cdot \log(f/650)$, f in MHz

3. VHF agreement

The maximum allowable interfering field strength $E_{\max int}$ is defined as follows:

DVB-T interfered by 7 MHz DVB-T: $E_{\max int} = 38 \text{ dB}\mu\text{V/m}$

DVB-T interfered by T-DAB: $E_{\max int} = 33 \text{ dB}\mu\text{V/m}$

T-DAB interfered by T-DAB: $E_{\max int} = 39 \text{ dB}\mu\text{V/m}$

T-DAB interfered by 7 MHz DVB-T: $E_{\max int} = 45 \text{ dB}\mu\text{V/m}$

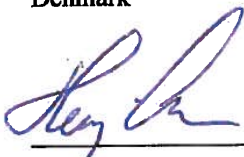
Two or more neighboring allotments using the same channel/block are treated as one allotment.

Geneva, 8th of June 2006

On behalf of the Administration of

Denmark

Poland



Henning Andersen



Krystyna Kuhn

Agreement between Norway and Denmark for the frequency band 174-240 MHz

AFTALER

If the cumulative interfering field strength exceeds the values ($E_{\text{max int}}$) listed in the tables below on the boundary of co-channel/co-block allotments or the allotment implementation is not in conformity, co-ordination with the affected administration is needed.

The propagation model to be used for calculating cumulative interfering field strength is ITU-R 1546 database (1 % of time, 50 % of location, fixed receiver antenna height of 10 m); the summation method to be used is the power sum method.

For affected T-DAB it is proposed to use the $E_{\text{max int}}$ for RPC5 and for affected DVB-T it is proposed to use the $E_{\text{max int}}$ for RPC2.

The agreement is also valid for applications other than T-DAB and DVB-T as long as the applications comply with the agreed $E_{\text{max int}}$ values and the respective spectrum masks.

T-DAB interfered with by T-DAB for 200 MHz

Reference planning configuration	RPC5
Location probability	95%
Reference C/N [dB]	15
Reference ($E_{\text{med}}\text{ref}$) [$\text{dB}\mu\text{V/m}$]	66
CF (correction factor)	14.6
IM (implementation margin)	2.6
$E_{\text{max int}}$ [$\text{dB}\mu\text{V/m}$]	39 (see exceptions in Table 2)

Table 1: $E_{\text{max int}}$ for T-DAB interfered by T-DAB

Exceptions for the Norwegian allotment NOR00018 (OSLO_AKERSHUS_OESTFOLD) and the Danish allotment DNK-NAT-12C-3

In the following test points, an increased $E_{\text{max int}}$ is accepted:

Testpoint nbr	Longitude	Latitude	$E_{\text{max int}}$ [$\text{dB}\mu\text{V/m}$]
5 (Oslo Fjord - NOR00018)	011E0015	59N0015	42,8
6 (Oslo Fjord - NOR00018)	010E5346	59N0407	42,2
7 (Oslo Fjord - NOR00018)	010E4553	59N1128	41,2
8 (Oslo Fjord - NOR00018)	010E3059	59N1839	40
15 (DNK-NAT-12C-3)	10E14	57N4144	39,7
16 (DNK-NAT-12C-3)	10E25	57N47	42,7
17 (DNK-NAT-12C-3)	10E36	57N46	42,8
18 (DNK-NAT-12C-3)	10E3930	57N2710	40,2
19 (DNK-NAT-12C-3)	11E12	57N24	40,2

Table 2: Exceptions to the general values of Table 1

T-DAB interfered with by 7 MHz DVB-T for 200 MHz

Reference planning configuration	RPC5
Location probability	95%
Protection Ratio [dB]	9
Reference ($E_{med,ref}$) [dB μ V/m]	66
CF (correction factor)	14.6
IM (implementation margin)	2.6
$E_{max, int}$ [dB μ V/m]	45

Table 3: $E_{max, int}$ for T-DAB interfered with by 7 MHz DVB-T

DVB-T interfered with by 7 MHz DVB-T for 200 MHz

Reference planning configuration	RPC2
Location probability	95%
Protection Ratio [dB]	19
Reference ($E_{med,ref}$) [dB μ V/m]	67
CF (correction factor)	12.8
IM (implementation margin)	2.8
$E_{max, int}$ [dB μ V/m]	38

Table 4: $E_{max, int}$ for DVB-T interfered with by 7 MHz DVB-T for 200 MHz

DVB-T interfered with by T-DAB for 200 MHz

Reference planning configuration	RPC2
Location probability	95%
Protection Ratio [dB]	23.6
Reference ($E_{med,ref}$) [dB μ V/m]	67
CF (correction factor)	12.8
IM (implementation margin)	2.4
$E_{max, int}$ [dB μ V/m]	33

Table 5: $E_{max, int}$ for DVB-T interfered with by T-DAB

11th May 2010



Flemming Alstrup
NITA, Denmark



John-Eivind Velure
NPT, Norway

Agreement between Denmark and Sweden concerning the use of the broadcast band planned at the RRC 2006 for the band 174-230 MHz

The parties agree that any implementation of allotments, shall be coordinated if the cumulative interfering field strength from the given SPN exceeds the values listed in Annex 1 on the boundary of any existing co-channel/co-block allotment.

Assignments will not be protected individually; it is the allotment area to which the assignments belong that will be protected. The respective service areas of these assignments outside of the allotment area are not protected.

Assignments, that are situated within an allotment area, designated to transmit on the same channel as the allotment, but not linked to that allotment, will be treated in the implementation exactly like linked assignments in the RRC 06 planning process.

Place: *Lillesand*

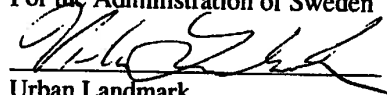
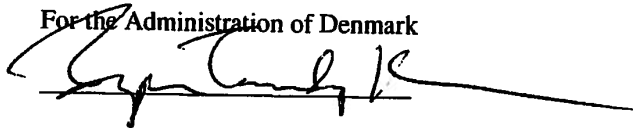
Place: Stockholm

Date: *26/4 2012*

Date: 25th of April 2012

For the Administration of Denmark

For the Administration of Sweden



Urban Landmark
Director of Spectrum Department

Annex 1 to agreement between Denmark and Sweden

Interfering field strength requiring coordination for DVB-T and T-DAB in VHF band III

If the cumulative interfering field strength exceeds the values listed in Table 1-4 below on the boundary of any existing co-channel/co-block allotment, coordination with the affected administration is needed.

For affected DVB-T it's proposed to use the $E_{\max \text{ int}}$ for RPC2 and for affected T-DAB it's proposed to use the $E_{\max \text{ int}}$ for RPC5.

Calculation setup:

- Field strengths are calculated at 10 meters height for 1% time, 50% of locations.
- The power sum method is used to calculate the cumulative interference field strength.
- The cumulative interference field strength is calculated at the boundary of the co-channel/co-block allotments.
- For field strength calculation, the latest version of the propagation model ITU-R P. 1546 should be used.
- The land-sea data from IDWM should be used.

DVB-T interfered by DVB-T for 200 MHz

Reference planning configuration	RPC2
Reference location probability	95%
Reference C/N [dB]	19
Reference ($E_{\text{med}}\text{ref}$) [dB μ V/m] at 200 MHz	67
CF at 200 MHz	12.8
IM	2.8
$E_{\max \text{ int}}$ [dB μ V/m] at 200 MHz	38

Table 1 $E_{\max \text{ int}}$ for DVB-T interfered by DVB-T

T-DAB interfered with by T-DAB for 200 MHz

Reference planning configuration	RPC5
Location probability	95%
Reference C/N [dB]	15
Reference ($E_{\text{med}}\text{ref}$) [dB μ V/m]	66
CF	14.6
IM	2.6
$E_{\max \text{ int}}$ [dB μ V/m]	39

Table 2 $E_{\max \text{ int}}$ for T-DAB interfered by T-DAB

DVB-T interfered by T-DAB for 200 MHz

Reference planning configuration	RPC2
Reference location probability	95%
Protection ratio [dB]	23.6
Reference (E _{med}) _{ref} [dBμV/m] at 200 MHz	67
CF at 200 MHz	12.8
IM	2.4
E _{max int} [dBμV/m]	33

Table 3 E_{max int} for DVB-T interfered by T-DAB

T-DAB interfered with by 7 MHz DVB-T for 200 MHz

Reference planning configuration	RPC5
Location probability	95%
Protection ratio [dB]	9
Reference (E _{med}) _{ref} [dBμV/m]	66
CF	14.6
IM	2.6
E _{max int} [dBμV/m]	45

Table 4 E_{max int} for T-DAB interfered with by 7 MHz DVB-T

Derivation maximum allowable interfering field strength

The maximum allowable interfering field strength, $E_{\max \text{ int}}$, at any test point given by the input requirement is calculated as follows:

$$E_{\max \text{ int}} = E_{\text{med}} - CF - PR + IM$$

where

E_{med} is the minimum median equivalent field strength (in dBμV/m) for 200 MHz;

CF is the combined location correction factor: $CF = q\sqrt{\sigma_w^2 + \sigma_i^2}$;

q is the distribution factor;

σ_w is the standard deviation of the lognormal distribution of the wanted signal (in dB);

σ_i is the standard deviation of the lognormal distribution of the interfering signal (in dB);

PR is the appropriate protection ratio;

When the interfering system is of the same type as the wanted one, PR is equal to C/N for the wanted system's RPC. PR and C/N are taken from Addendum 12 to Document 7-E, input from CEPT to RRC-06.

IM is the implementation margin (in dB).