

International Telecommunication Union

SPECTRUM MANAGEMENT SYSTEM FOR DEVELOPING COUNTRIES

**SMS4DC**

SYSTÈME DE GESTION DU SPECTRE POUR LES PAYS EN DÉVELOPPEMENT

Version 4.1

● english  
● français

# WTDC-14 Side event

Monday, 7th April

13:30 – 14:15

Room D



INFRASTRUCTURE

## Guidelines for THE TRANSITION FROM ANALOGUE TO DIGITAL BROADCASTING

Report



J A N U A R Y 2 0 1 4  
Telecommunication Development Sector





# Overview

- This session will include a presentation of Spectrum Management System for Developing Countries (SMS4DC). This computer program provides assistance in the technical and regulatory procedures for managing the spectrum allocated to the Land Mobile, Fixed and Broadcasting services, in full compliance with the relevant ITU recommendations. The presentation explains the main features of the software and also the relevant spectrum management activities of the BDT. Detailed information about the software can be found on:

<http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Pages/Spectrum-Management.aspx>

- This session will also address the transition from analogue to digital broadcasting. ITU is assisting member countries to smoothly shift to digital broadcasting by providing guidelines on how to make a national plan for the transition including technical, policy, legal, regulatory, social, economic and customer related aspects, consultation to develop roadmaps and training on digital broadcasting technologies and policies including assistance for the relevant spectrum issues for the transition. The presentation provides an overlook on the main points of the guidelines and on the BDT activities related to broadcasting issues The Guidelines can be downloaded from

<http://www.itu.int/en/ITU-D/Spectrum-Broadcasting/Documents/Guidelines%20final.pdf>



# Spectrum management

- Wireless technology has changed our lives drastically and has a great potential to improve our life quality.
- Introduction and expansion of new services is seriously impeded in the absence of effective spectrum management structures.
- BDT works to strengthen national regulatory bodies in frequency planning and assignment, management and monitoring.
- BDT provides assistance in various aspects of spectrum management including specialized tools for this purpose.





# SPECTRUM MANAGEMENT ACTIVITIES OF BDT/IEE/SBD

- Developing principles and techniques for effective spectrum management
- Advising on practical questions from developing countries on spectrum management
- Providing an opportunity for expert and high-level consultation for senior personnel from developing countries
- Providing information on various aspects of spectrum management systems
- Evaluating existing systems and participate in the evaluation of tenders
- Participating in seminars and courses organized at ITU Headquarters or elsewhere on specialized aspects of spectrum management subjects



# SPECTRUM MANAGEMENT ACTIVITY EXAMPLES

- **SMS4DC (Spectrum Management Software for Developing Countries)**
  - Developed by BDT in close cooperation with the ITU-R sector
    - Trainings
    - Presentations
- **ITU-D SG2, Resolution 9**
- **Assistance to developing countries**
  - spectrum management assessments
  - revising legislation
  - spectrum pricing
  - coordination procedures,
  - assisting in spectrum management projects



# Spectrum Management Training Program

- ITU establishing Spectrum Management Training Program:
  - Unified course, offering students across the globe access to state-of-the-art holistic SM training and forward-looking professional vision
  - Formalised assessment ensuring certain unified quality of professional education
  - Certification to give international recognition, with possible option of university credits/diploma





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# History

- ITU-R and ITU-D cooperation
- 1995 BASMS (FoxPro)
- 1997 WinBASMS
- WTDC March 2002: further developments
- 2002 ITU-R SG1: Rec. ITU-R SM.1604
- Consolidated technical specification: 2004
- 2007 first quarter: Version 1
- 2008 first quarter: Version 2
- 2009 third quarter: Version 3
- 2012 first quarter: Version 4
- 2014 first quarter: Version 4.1





# Main Functions of SMS4DC/1

## Administrative Functions

- Relational database management
- Recording frequency application, frequency assignment, licensing, coordination data, import data from BRIFIC & SRS
- Producing electronic notices, print license, invoice & spectrum fee
- Security features: Multi level access enables system administrator to define users and groups with different access levels



# Main Functions of SMS4DC/2

## Engineering Analysis Functions

- Enhanced analysis tools for frequency arrangement, assignment, coordination and interference calculation
- Propagation models based on ITU-R latest recommendations available at the time of development
- Coverage area, field strength, field strength contour, microwave link calculations, network coverage and best server calculation
- Azimuth, elevation and horizon elevation for earth stations
- Link to monitoring software



# Main Functions of SMS4DC/3

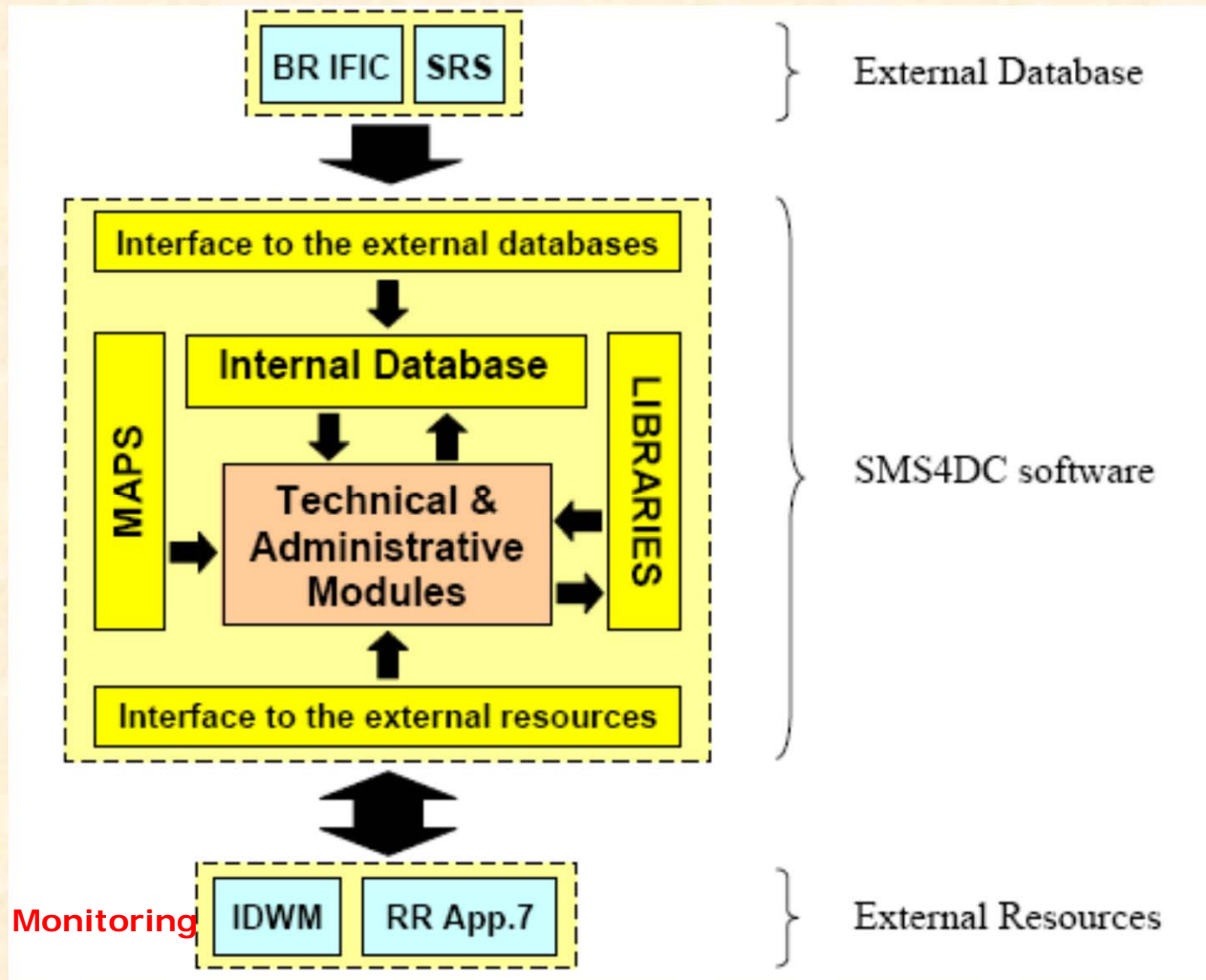
## Geographic Map Display Function

- User friendly interface, displaying of DTM, capability of importing standard mapping formats including Globe map, displaying of other higher resolution maps and export to Google Earth
- Online latitude, longitude and altitude presentation, overlaying, Scrolling and Zooming functionality capability of handling vectors,
- Providing multiple entry functions, menu items, assigning new stations on map and searching and displaying a station or group of stations on map.





# STRUCTURE OF SMS4DC





# SMS4DC's Administrative Functions

## Supervisory tasks

- User access
- Backup/Restore
- Audit control



**Audit trail**

User Name: All Action: All Table: All

| User     | Date/Time           | Action                      | Record no. | Table     |
|----------|---------------------|-----------------------------|------------|-----------|
| Saman    | 2005-10-11 05:24:18 | Update equipment            | 1          | Equipment |
| Saman    | 2005-10-11 07:29:26 | Update frequency            | 30         | Frequency |
| Saman    | 2005-12-11 21:50:39 | Update frequency            | 43         | Frequency |
| Saman    | 2005-12-11 21:51:13 | Update frequency            | 44         | Frequency |
| Saman    | 2005-12-11 21:52:39 | Update frequency            | 43         | Frequency |
| Saman    | 2005-12-11 21:52:58 | Update frequency            | 44         | Frequency |
| admin    | 2005-11-13 09:57:54 | Delete fixed/base station   | 42         | Station   |
| SMS4DC   | 2005-11-14 04:47:13 | Update antenna              | 6          | Antenna   |
| SMS4DC   | 2005-11-14 10:48:16 | Add payment                 | 6          | Payment   |
| SMS4DC   | 2005-11-14 14:06:54 | Delete license              | 3          | License   |
| SMS4DC   | 2005-11-15 11:48:42 | Update frequency            | 51         | Frequency |
| SMS4DC   | 2005-11-15 11:48:55 | Update frequency            | 51         | Frequency |
| SMS4DC   | 2005-11-15 11:49:30 | Update frequency            | 52         | Frequency |
| Somebody | 2005-11-21 08:31:46 | Update broadcasting station | 9          | BCStation |
| Somebody | 2005-11-21 08:52:22 | Update broadcasting station | 2          | BCStation |
| Somebody | 2005-11-21 10:06:49 | Update broadcasting station | 2          | BCStation |
| Somebody | 2005-11-21 10:07:22 | Add equipment               | 82         | Equipment |
| Somebody | 2005-11-21 10:08:54 | Add equipment               | 83         | Equipment |
| Somebody | 2005-11-21 10:10:03 | Add antenna                 | 53         | Antenna   |

**Access levels**

New

User Name:

User Password:

Modify

User Name: SMS4DC

User Password:

Access Level: 4 - Supervisor

Enabled

Delete Save Cancel



# SMS4DC's Administrative Functions

Dialog box for importing data from BRIFIC (Terrestrial)

**IFIC import**

**Service**

FM/TV  Allotments

LF / MF

FXM

**Administration**

ABW  
AFG  
AFS  
AGL  
AIA  
ALB  
...

Add --> <-- Remove

Clear

Import

Close

**Frequency conditions**

F = F1  
F <> F1  
F > F1  
F >= F1  
F < F1  
F <= F1  
F > F1 and F < F2  
F >= F1 and F <= F2  
F1 > F2

F = Assigned frequency

F1 =  MHz

F2 =  MHz

Add --> <-- Remove

**Class of Station**

Add -->

<-- Remove

Clear

**Fragment**

Add -->

<-- Remove

Clear

**Assign ID**

^

v

Import progress:





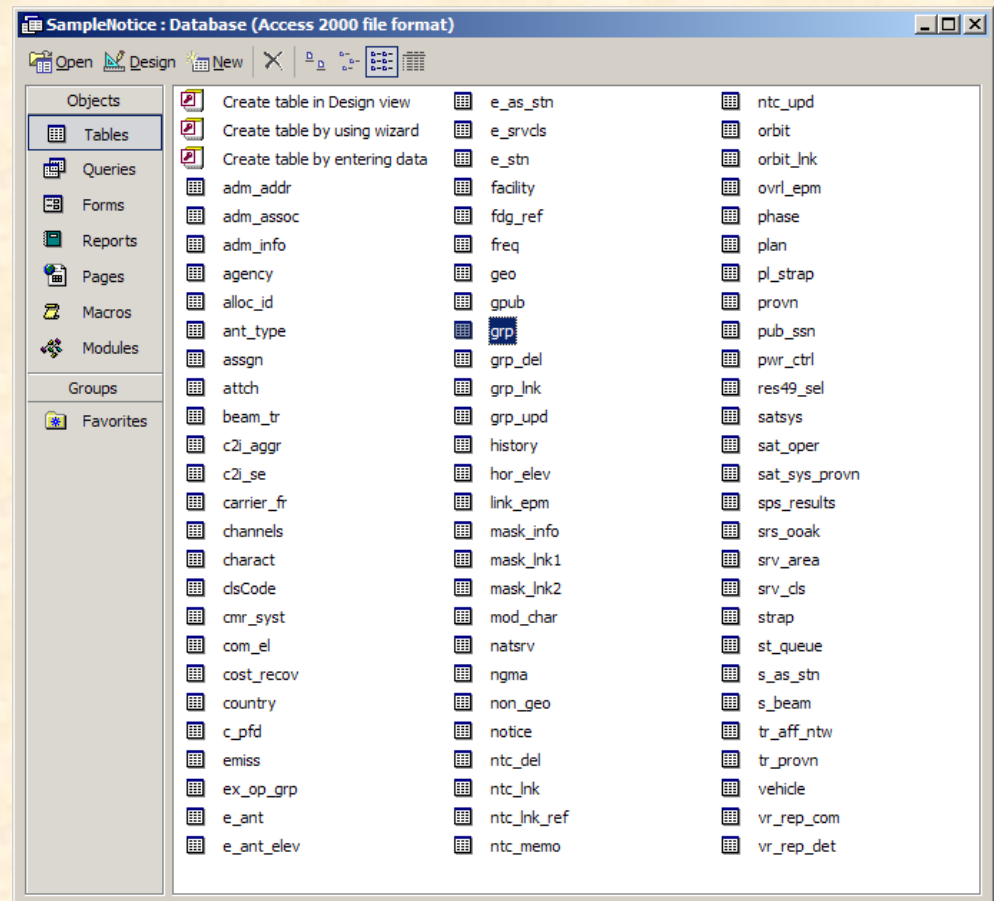
# SMS4DC's Administrative Functions

## Electronic notices to BR

Fixed, Land mobile, Broadcasting

Earth station

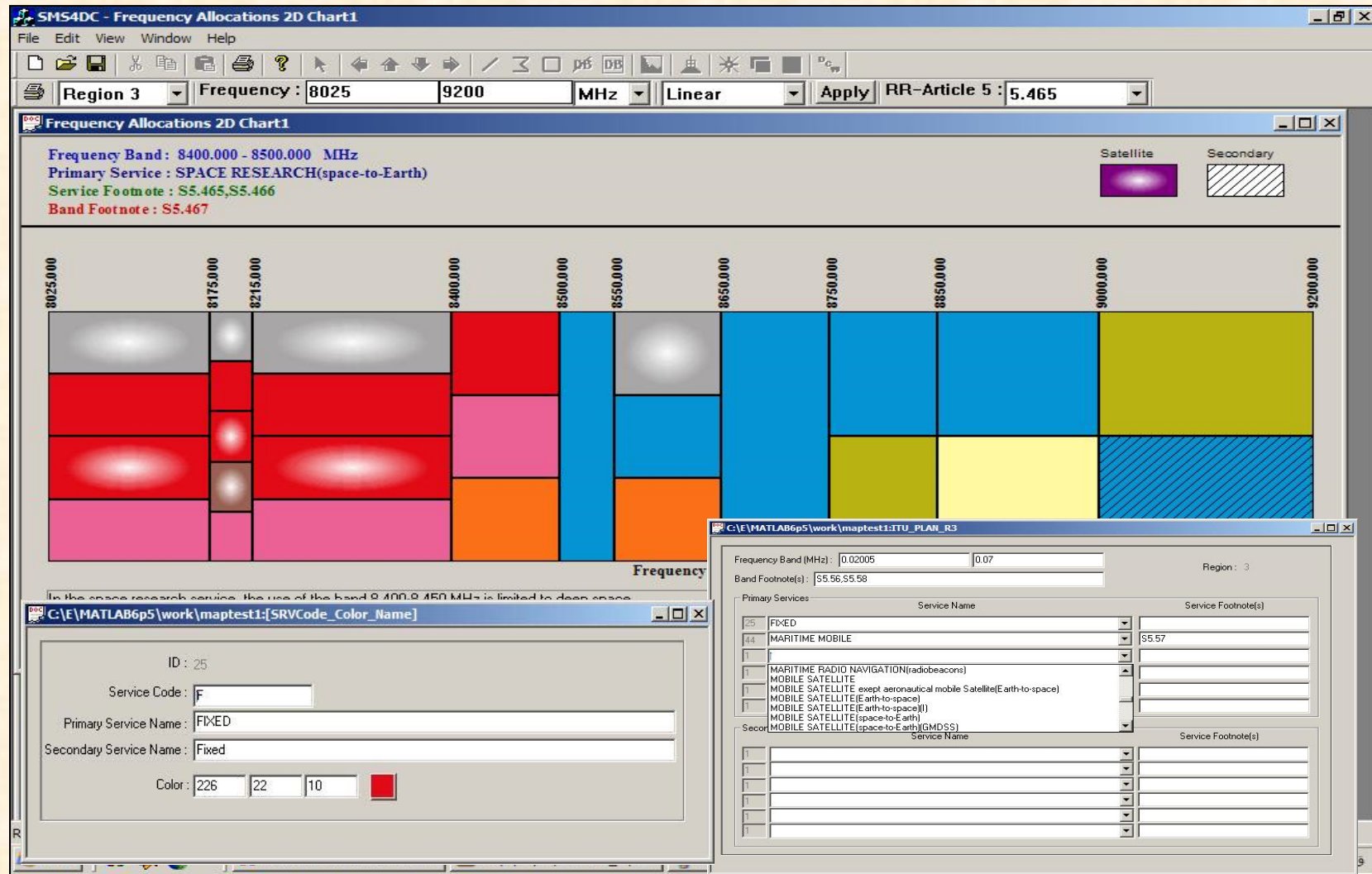
```
St1ADD2006-03-11.txt - Notepad
File Edit Format View Help
<HEAD>
t_adm=IRN
t_d_sent=2006-03-11
</HEAD>
<NOTICE>
t_fragment=NTFD_RR
t_notice_type=T13
t_prov=RR11.9
t_action=ADD
t_is_resub=FALSE
t_freq_assgn=150.000000
t_freq_carr=150.000000
t_d_inuse=2004-11-15
t_call_sign=Hello
t_site_name=Mobile1
t_emi_cls=F3E--
t_bdwidth_cde=8K50
t_long=+0500000
t_lat=+300000
t_stn_cls=ML
t_nat_srv=CR
t_op_hh_fr=00:00
t_op_hh_to=24:00
t_addr_code=A
t_op_agcy=001
t_ctry=IRN
<ANTENNA>
t_pwr_xyz=X
t_pwr_ant=10.000000
t_pwr_dbw=10.000000
t_pwr_eiv=l
</ANTENNA>
</NOTICE>
<TAIL>
t_num_notices=1
</TAIL>
```





# SMS4DC's Engineering Functions

International & National frequency allocations table (chart)





# SMS4DC's Engineering Functions

## Frequency arrangement (Homogeneous)

**Frequency Plan**

ID : 1      Frequency Plan ID : 382480.13      Region : Region 3      Service Priority : Primary

Service : Fixed

Type of Frequency Plan : Homogeneous

**$F_n = F_o + F_{off} + n \cdot X_S$  ,  $F'_n = F_o + F'_{off} + n \cdot X_S$**

Channel Spacing  $X_S$  : 130 MHz

Reference Frequency  $F_o$  : 38248 MHz

Lower Frequency Offset  $F_{off}$  : -1260 MHz

Upper Frequency Offset  $F'_{off}$  : 0 MHz

Channels

Number of Channels n : 40

First : 1      Last : 40      Channel Set : All

Comment :

CEPT Channel arrangement in 38 GHz Band-Homogeneous

Frequency List:

| No | $F_n$ | $F'_n$ | BandWidth |
|----|-------|--------|-----------|
| 1  | 36988 | 38248  | 130       |
| 2  | 37118 | 38378  | 130       |
| 3  | 37248 | 38508  | 130       |
| 4  | 37378 | 38638  | 130       |
| 5  | 37508 | 38768  | 130       |
| 6  | 37638 | 38898  | 130       |
| 7  | 37768 | 39028  | 130       |
| 8  | 37898 | 39158  | 130       |
| 9  | 38028 | 39288  | 130       |
| 10 | 38158 | 39418  | 130       |
| 11 | 38288 | 39548  | 130       |
| 12 | 38418 | 39678  | 130       |
| 13 | 38548 | 39808  | 130       |
| 14 | 38678 | 39938  | 130       |
| 15 | 38808 | 40068  | 130       |

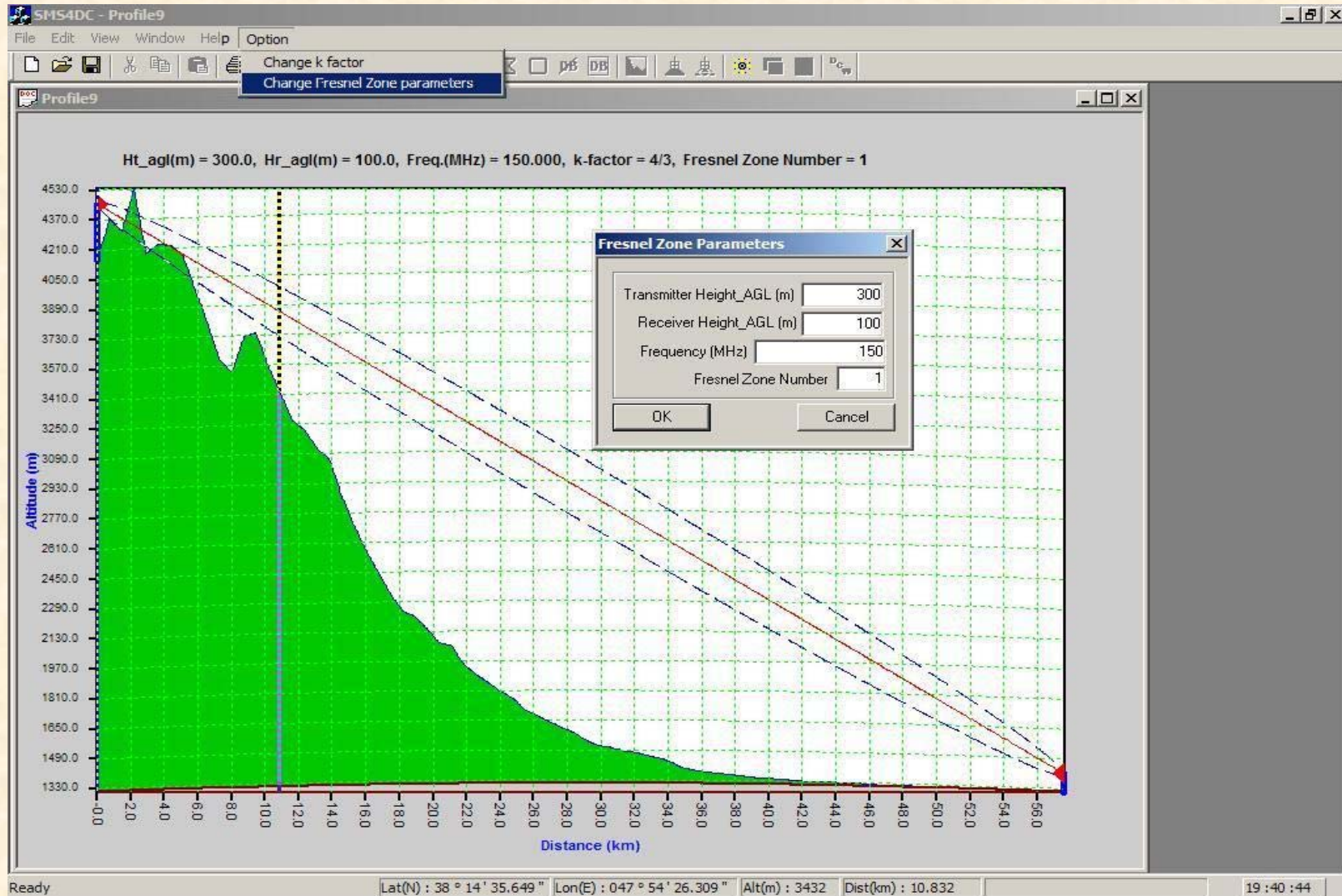
1 of 6





# SMS4DC's Engineering Functions

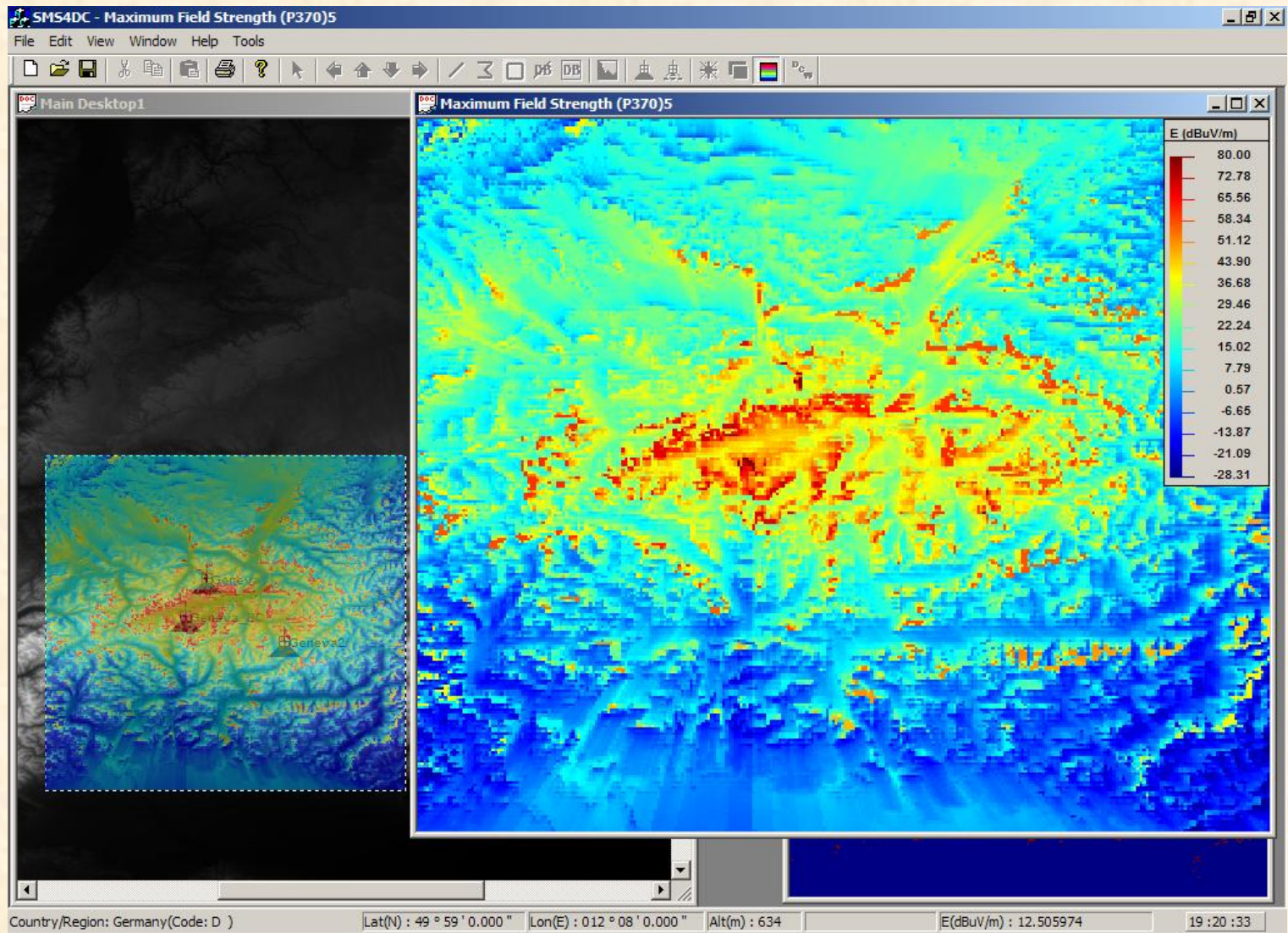
## Path profile with Fresnel Zone





# SMS4DC's Engineering Functions

## Network Processor : Maximum Field Strength

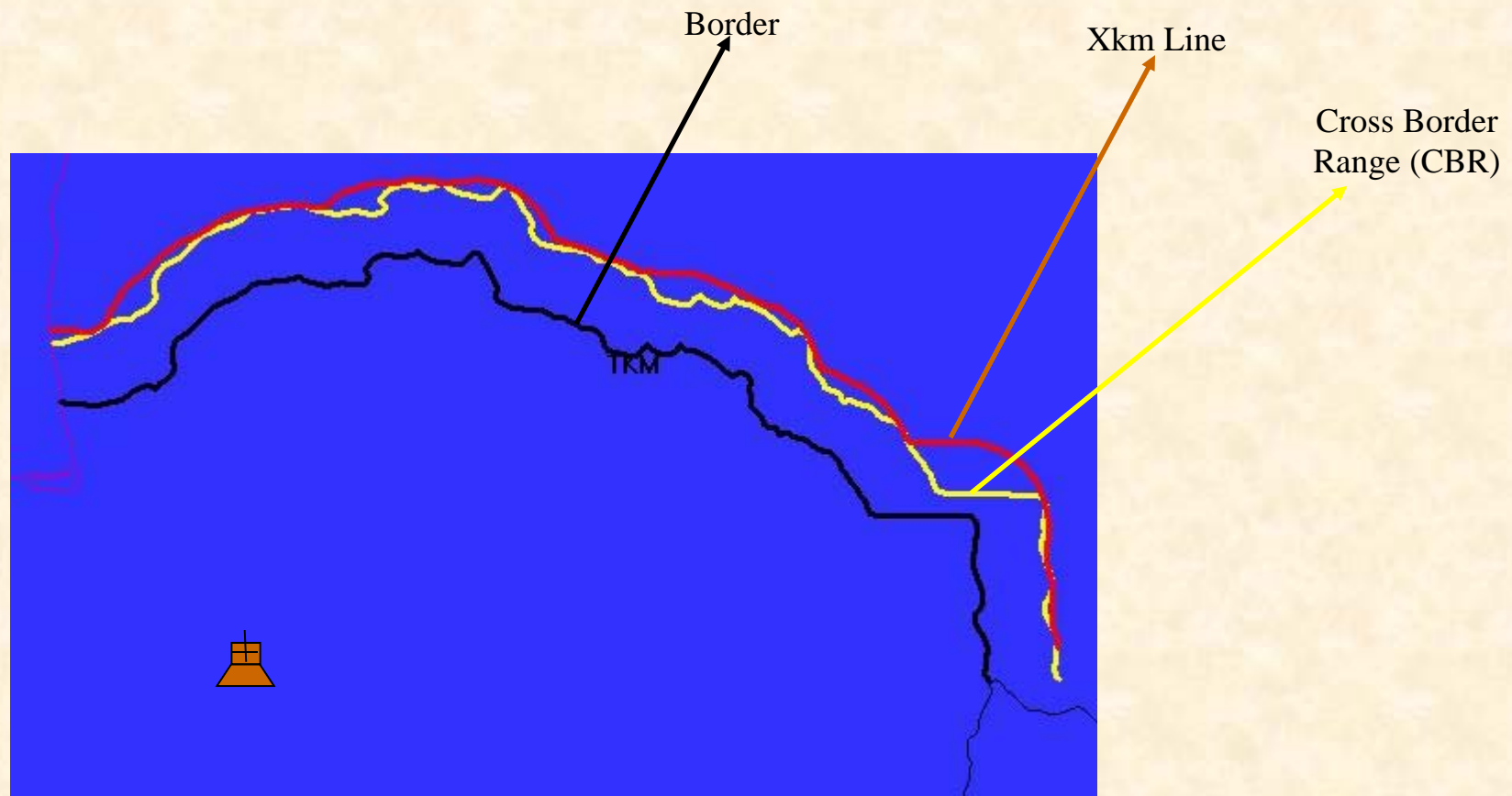






# SMS4DC's Engineering Functions

## Borderline frequency coordination

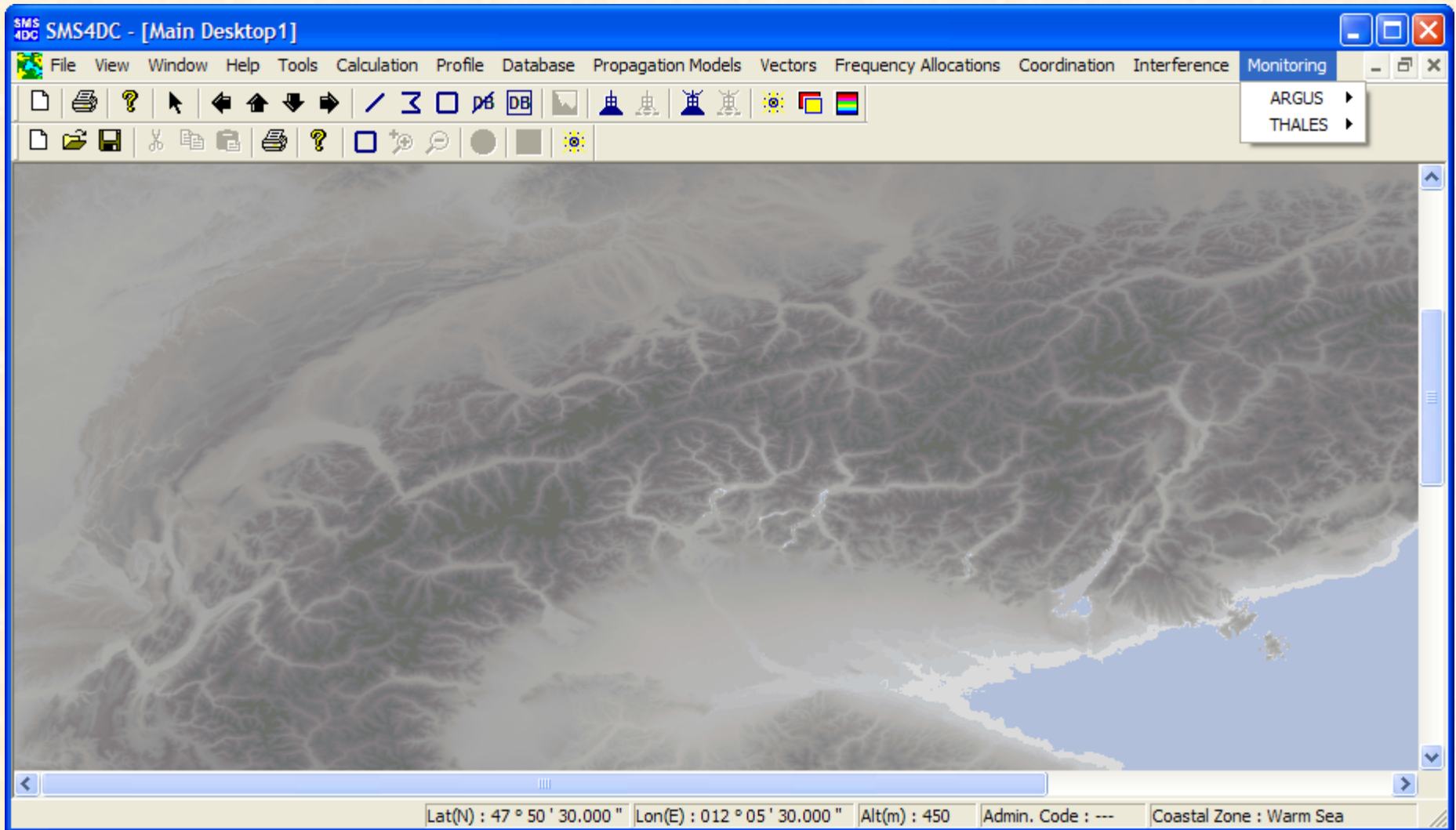






# SMS4DC's Engineering Functions

## SMS4DC and monitoring software interface

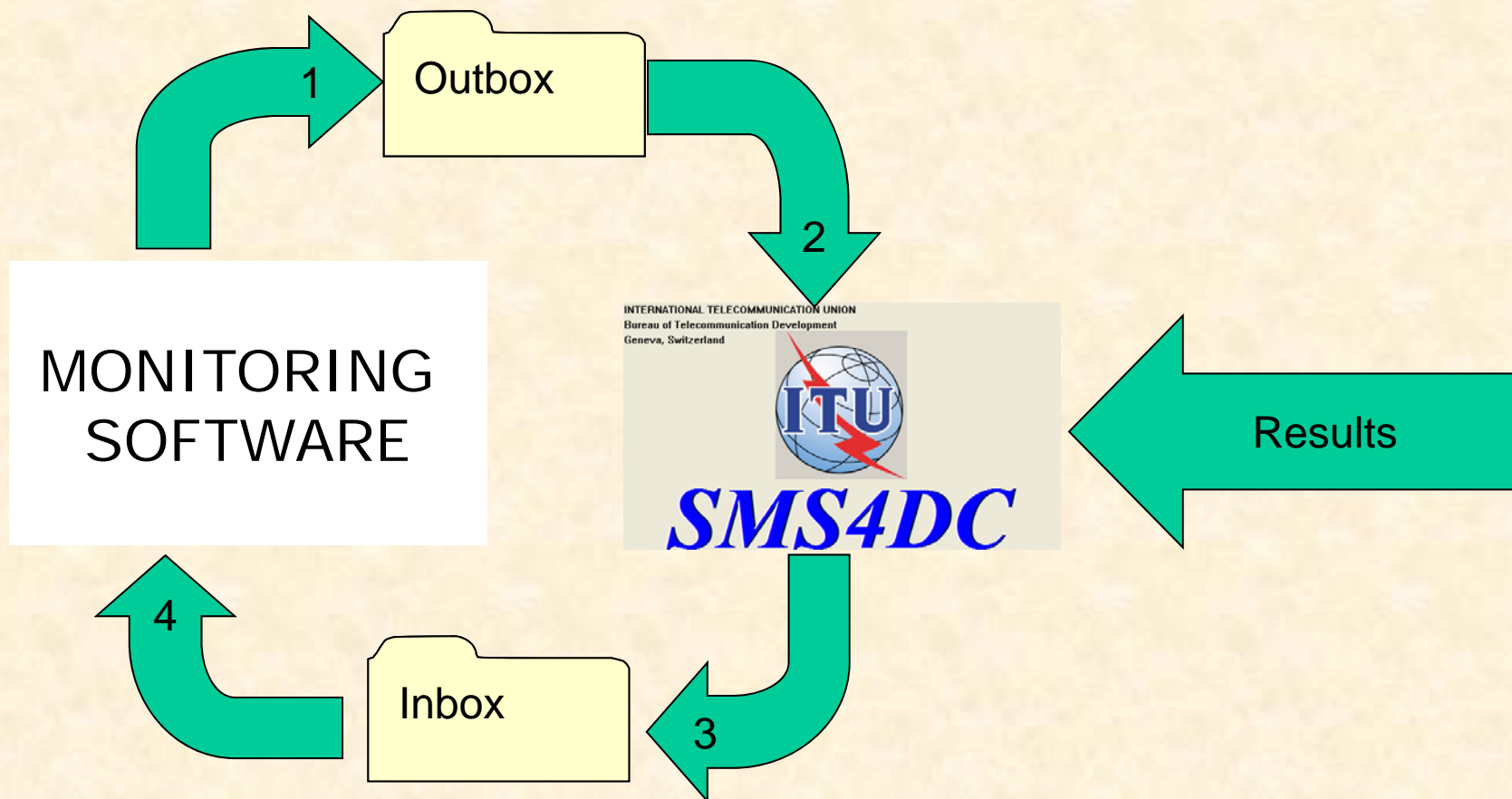




# SMS4DC's Engineering Functions

## SMS4DC and monitoring software interface

### Monitoring request to SMS4DC





# SMS4DC's Engineering Functions

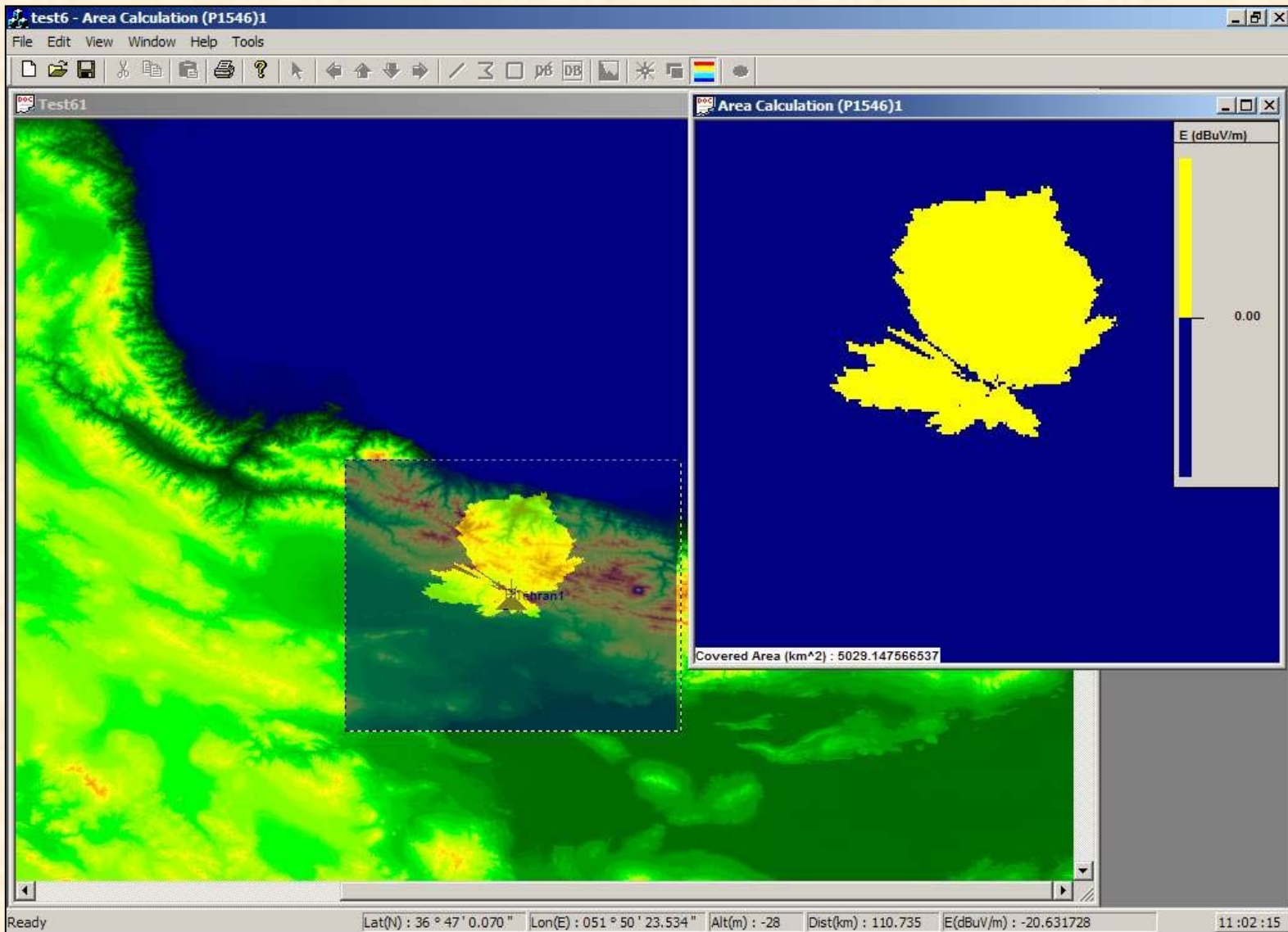
## **SMS4DC and monitoring software interface description**

- Experiences from the development of the interface to the two systems
- General interface description
- Provided to ITU-R WP1/C, September 2010



# Geographic Map Display functions

## Overlay possibility

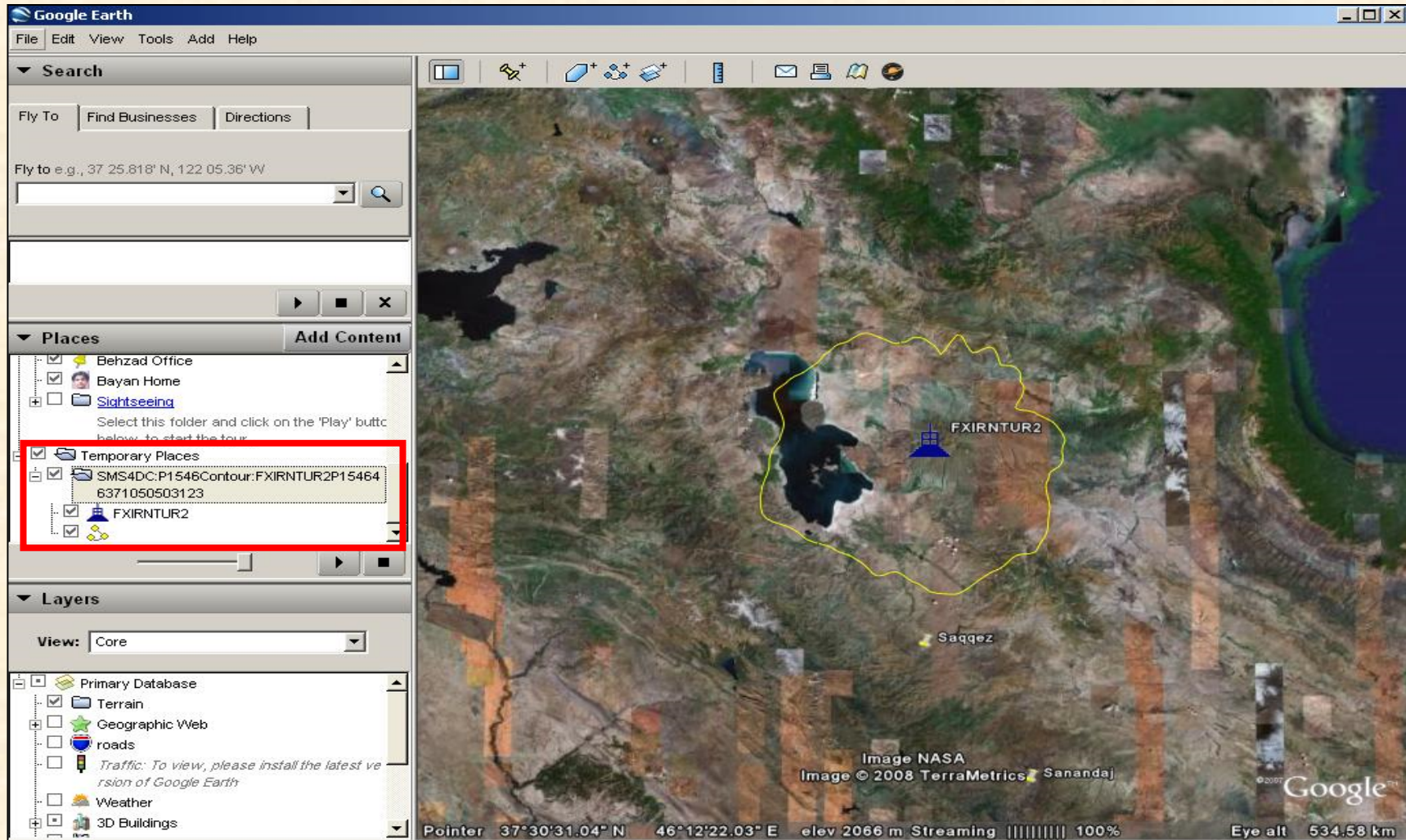






# Geographic Map Display functions

Google Earth Display - Field Strength Contour (P.1546)





# How to order SMS4DC

<http://www.itu.int/pub/D-STG-SPEC-2014-V4.1>

## Spectrum Management System for Developing Countries (SMS4DC) - Version 4.1



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### Spectrum Management System for Developing Countries (SMS4DC) - Version 4.1 2014



The Telecommunication Development Bureau (BDT) of the International Telecommunication Union (ITU) has released the fourth version of a harmonized, efficient, automated technical and administrative tool for spectrum management in developing countries under the brand name SMS4DC (Spectrum Management System for Developing Countries). Version 4.1 contains updates of the frequency allocation tables of ITU Regions 1, 2 and 3 (based on Article 5 of the Radio Regulations 2012) and the import from terrestrial BR IFIC (works with BR IFIC version 2739 and after). Also it contains addition of an interface with the Appendix 7 software module provided in the ITU-BR Space software tools for calculation of the coordination contours of the Earth stations, and a reporting mechanism with some general statistics reports. SMS4DC is sold as an integrated software package on CD-ROM in English and French, containing the software, a user manual and a digital terrain map of the world.



| ITEM DETAIL  |  |   | ARTICLE | PRICE          | CART     |
|--------------|--|---|---------|----------------|----------|
| MULTILINGUAL |  | Programme Installation Guide - Free of charge |         | Free of charge | DOWNLOAD |
|              |  | DVD   | 38838   | 5100 CHF       | ADD      |
| ENGLISH      |  | User's Guide                                  |         | Free of charge | DOWNLOAD |

[Publication Notice with Order Form](#)





# Price of the SMS4DC

## Annual license fee

|                                     |  |
|-------------------------------------|--|
| Date of publication:                | February 2014  |
| Languages:                          | English and French software interface; English user manual   |
| Hardware and software requirements: | Pentium 4-based PC, or compatible, with 512 MB of RAM (minimum), USB port and CD-ROM drive, running Microsoft® Windows® 2000, or Windows® XP Professional or Home Edition, Adobe® Reader |
| Condition                           | This product is not sold, but leased and licensed according to the Licence Agreement contained in the CD-ROM for a single user or multi-user (networked) environment                     |

|                 |                   |
|-----------------|-------------------|
| Article number: | 38838             |
| ISBN number:    | 978-92-61-14581-1 |

|  |                    |      |        |        |         |
|--|--------------------|------|--------|--------|---------|
| <i>Price in Swiss francs:</i>  | <b>CHF 5 100.-</b> |      |        |        |         |
| <i>Annual price for multiple users (for this publication only):</i>    |                    |      |        |        |         |
|  | Number of users    | 1    | 2-3    | 4-5    | 6-10    |
|  | Price multiplier   | 5100 | 7650.- | 8670.- | 10200.- |
| <i>Member State administrations and Sector Members and Associates:</i> | -15%               |      |        |        |         |
| <i>Administrations of the least developed countries:</i>               | -80%               |      |        |        |         |
| <i>Libraries of educational institutions (CD-ROM only):</i>            | -80%               |      |        |        |         |



## Version 4.1

- Updated Article 5 of ITU Radio Regulations (2012)
- Interface with Appendix 7 software module of the ITU-BR
- Bugs corrected
- Reporting facilities with some general statistics report





# Further developments

Project funded by Ministry of Science, ICT and Future Planning (MSIP), Korea and ITU

- Revision of SMS4DC package to incorporate the recent relevant changes in the Radio Regulations, International Frequency Information Circulars (IFICs), ITU-R Recommendations and other applicable changes in the relevant ITU-R administrative procedures, regulations, and ITU-BR databases and software (i.e. synchronizing with the changes done e.g. on IFICs, updating the information on ITU Digitized World Map (IDWM));
- Development of additional and/or enhanced functionalities, addition or revision of propagation models, and addition of new services;
- Provision of the SMS4DC software and related documentation in at least one additional language;
- Final approval test of the revised version of SMS4DC software package; and
- Preparation of training materials and trainings.



# Revision of SMS4DC package

- Revise the SMS4DC specification as required for the upgraded version;
- Addition of a general data interface between monitoring software and SMS4DC based on the guidelines prepared for ITU-R Study Group 1/Working Party 1C (ITU-R SG1/WP1C);
- Update the "Import from IFIC" function in order to be synchronized with the changes done on new (terrestrial and space) BR IFIC;
- Update the SMS4DC according to the updates on ITU Digitized World Map (IDWM).



## Development of additional and/or enhanced functionalities

- Revision/Addition of propagation models based on the latest version of P.452, P.530, P.1546 and P.1812;
- Inclusion of Dynamic Link Library (DLL) for Harmonised Calculation Method (HCM);
- Further development of built-in and user specified administrative reports;
- Preparation of a general method to import data to SMS4DC;
- Insertion of fee calculation models;
- Adding aeronautical radionavigation service to the calculation module of Geneva 06 plan (GE-06); addition of maritime mobile service;
- Renewal of subscription e.g. via web;
- Website design in order to provide relevant news and a forum for users to discuss their experiences.



# One additional language

- Preparation of the SMS4DC software in Spanish;
- Update the User Manual and the Executive Summary in order to address new functions, services and developments in respect of the SMS4DC done under this project;
- Translation of the User Manual and the Executive Summary relating to the SMS4DC into French and Spanish.





# Final approval test

- Preparation and approval of a protocol for testing and finally approving the revised version of the SMS4DC software;
- Execution of the approval test of the SMS4DC software on the basis of such test protocol, with the participation of the SMS4DC developers, experts and trainers, and ITU staff from BR and BDT.



## Preparation of training materials

- Preparation of time limited version as a demo tool which can be used for introduction of SMS4DC;
- Preparation of the training material (as a multimedia DVD) for assisting self-learning training of the software.
- Trainings



sms4dc@itu.int



# Broadcasting

- Transition from analogue to digital broadcasting already begun in many developing countries is expected to reach peak level in the next cycle in Regions 2 and 3 and finalized in Region 1.
- The objective of BDT work in this area is to enable developing countries to achieve smooth transition from analogue to digital broadcasting and follow with the countries the post-transition activities like e.g. introducing new broadcasting services, allocation of the digital dividend.
- In particular BDT is providing assistance on policy and regulatory frameworks for digital broadcasting and organizing regional meetings for ITU members on the use of spectrum for broadcasting or other services.





## BROADCASTING RELATED ACTIVITIES OF BDT/IEE/SBD

- Advising on practical questions from developing countries on broadcasting
- Providing an opportunity for expert and high-level consultation for senior personnel from developing countries
- Providing information on various aspects of sound and television broadcasting systems/networks
- Participating in seminars and courses organized at ITU Headquarters or elsewhere on specialized aspects of broadcasting



# BROADCASTING ACTIVITY EXAMPLES

- **Transition from analogue to digital broadcasting**
  - Guidelines for developing roadmap (support from Korea, Japan)
  - Roadmap project for Africa, Asia-Pacific, Caribbean (Funded by Korea, Japan, ITU)
  - ITU-D SG2 Question 11-3/2
- **Cooperation with regional broadcasting unions**
  - e.g. WBU, EBU, ABU, AIBD, CBU, ASBU, AUB
- **Delivering seminars for capacity building**
- **Assistance to developing countries**



# *Regional initiatives*

- In all regions Digital broadcasting and transition
  - Africa
  - Asia Pacific
  - Arab
  - Americas
  - Europe (Central and Eastern Europe)
  - CIS



## *Assistance provided by BDT (example) Asia-Pacific region*

- KCC phase 1, Five countries :
  - Cambodia, Mongolia, Nepal, Sri Lanka, Tonga
- KCC phase 2: Seven countries:
  - Fiji, Indonesia, Myanmar, PNG, Philippines, Thailand, Laos and Timor Leste (in process)
- KCC phase 3: Three countries
  - Bangladesh, Vietnam
  - Guyana (Caribbean)
- Additional assistance:
  - Bhutan, Maldives
  - Co-organizing workshops, seminars with ABU and AIBD
- Strengthening cooperation agreement among ITU-ABU-AIBD





## *Documents, reports*

- **Guideline for the Transitions**
  - Available in French
  - Update with Asia-Pacific information, including archives:
    - [http://www.itu.int/ITU-D/tech/digital\\_broadcasting/project-dbasiapacific/Digital-Migration-Guidelines\\_EV7.pdf](http://www.itu.int/ITU-D/tech/digital_broadcasting/project-dbasiapacific/Digital-Migration-Guidelines_EV7.pdf)
- **Roadmaps for ASP and AFR**
  - [http://www.itu.int/ITU-D/tech/digital\\_broadcasting/project-dbafrica/db\\_afr\\_roadmaps.html](http://www.itu.int/ITU-D/tech/digital_broadcasting/project-dbafrica/db_afr_roadmaps.html)
  - [http://www.itu.int/ITU-D/tech/digital\\_broadcasting/project-dbasiapacific/db\\_asp\\_roadmaps.html](http://www.itu.int/ITU-D/tech/digital_broadcasting/project-dbasiapacific/db_asp_roadmaps.html)
- **Digital Dividend: Insights for spectrum decisions**
  - [http://www.itu.int/ITU-D/tech/digital\\_broadcasting/Reports/DigitalDividend.pdf](http://www.itu.int/ITU-D/tech/digital_broadcasting/Reports/DigitalDividend.pdf)
- **Digital broadcasting trends**
  - <http://www.itu.int/en/ITU-D/Technology/Documents/Broadcasting/TrendsInBroadcasting.pdf>
- **Spectrum Management Training Program (SMTP)**
  - <http://academy.itu.int/index.php/news/item/1077-smcp>



INFRASTRUCTURE

# Guidelines for THE TRANSITION FROM ANALOGUE TO DIGITAL BROADCASTING

Report



J A N U A R Y 2 0 1 4  
Telecommunication Development Sector



WTDC-2014, 7 April 2014

42



# *Introduction*

A roadmap  
is a  
management  
forecasting  
tool

- Directed to the implementation of strategy and related to project planning
- Matching short-term and long-term goals
- Indicating the main activities needed to meet these goals

Roadmap  
development  
has three  
major uses

- Helping to reach consensus about requirements and solutions
- Providing a mechanism to help forecast the key milestones
- Providing a framework to help plan and coordinate the steps needed



# *Situation and challenge*

## Situation

- ITU/BDT activity on the implementation of regional initiatives projects approved by WTDC-06 and WTDC-10
- With support of:
  - ITU
  - Korea Communications Commission (KCC), Republic of Korea (now MSIP)

## Challenge

- Efficient spectrum management and the transition from analogue to digital broadcasting are critical issues for policy makers, regulators, broadcasters and other stakeholders
  - Given the increasing demand for limited radio-frequency resources
- Different time-scales for transition from analogue to digital broadcasting according to:
  - National priorities
  - GE06 Agreement, where applicable
    - analogue TV will no longer be protected after 17 June 2015
    - in a number countries, not after 17 June 2020 in Band III





## *Scope and objective*

### Scope

- Guidelines on
  - Transition from analogue TV to Digital Terrestrial Television Broadcasting (DTTB)
  - Introduction of Mobile Television Broadcasting (MTV)
- Identification of
  - Policy, economic and technology choices
  - Their potential impact DTTB and MTV introduction
- Providing
  - Information regarding the cost benefit analysis of policy decisions and best practices
  - Many practical examples and references to documents for additional or more detailed information

### Objective

- To assist administrators, regulators, broadcasters and other stakeholders in developing countries in researching and supporting the introduction of digital broadcasting



# *Guidelines: Situation and Updates*

## ORIGINAL

- 2009 funded by KCC: for African countries (80 % general)
- 2011 (KCC/MSIP): Guidelines Updated to reflect the different ITU rules and requirements in Region 3 (Asia Pacific)
- Addition of New Chapter on Archives Migration
- 2013 Project funded by MIC, Japan
- Incorporate
  - updated information, new technologies,
  - satellite TV, cable TV, IPTV
- Tokyo, April 2013: Group of experts
  - Jan Doeven, Peter Walop, Gu-Yean Hwang
  - Colin Knowles
  - Junji Kumada, Yukihiro Nishida, Sharad Sadhu, Kazuyoshi Shogen
- In cooperation with
  - Roger Bunch, vice-chairman of ITU-R Study Group 6
  - ITU BR and BDT

## UPDATES



# Structure of the Guidelines

|                |   |
|----------------|---|
| <b>Part 1</b>  | Introduction  |
| <b>Part 2</b>  | Policy and regulation   |
| <b>Part 3</b>  | Market and business development   |
| <b>Part 4</b>  | DTTB networks   |
| <b>Part 5</b>  | MTV networks  |
| <b>Part 6</b>  | Roadmap development   |
| <b>Annex A</b> | Implementation of the GE06 Agreement                                    |
| <b>Annex B</b> | More detailed information on some regulatory topics                     |
| <b>Annex C</b> | More detailed information on some DTTB network topics                   |
| <b>Annex D</b> | More detailed information on some MTV network topics                    |
| <b>Annex E</b> | Guidelines for migration of broadcast archives from analogue to digital |
| <b>Annex F</b> | Television broadcasting via satellite                                   |
| <b>Annex G</b> | Television broadcasting via cable TV networks and IPTV                  |



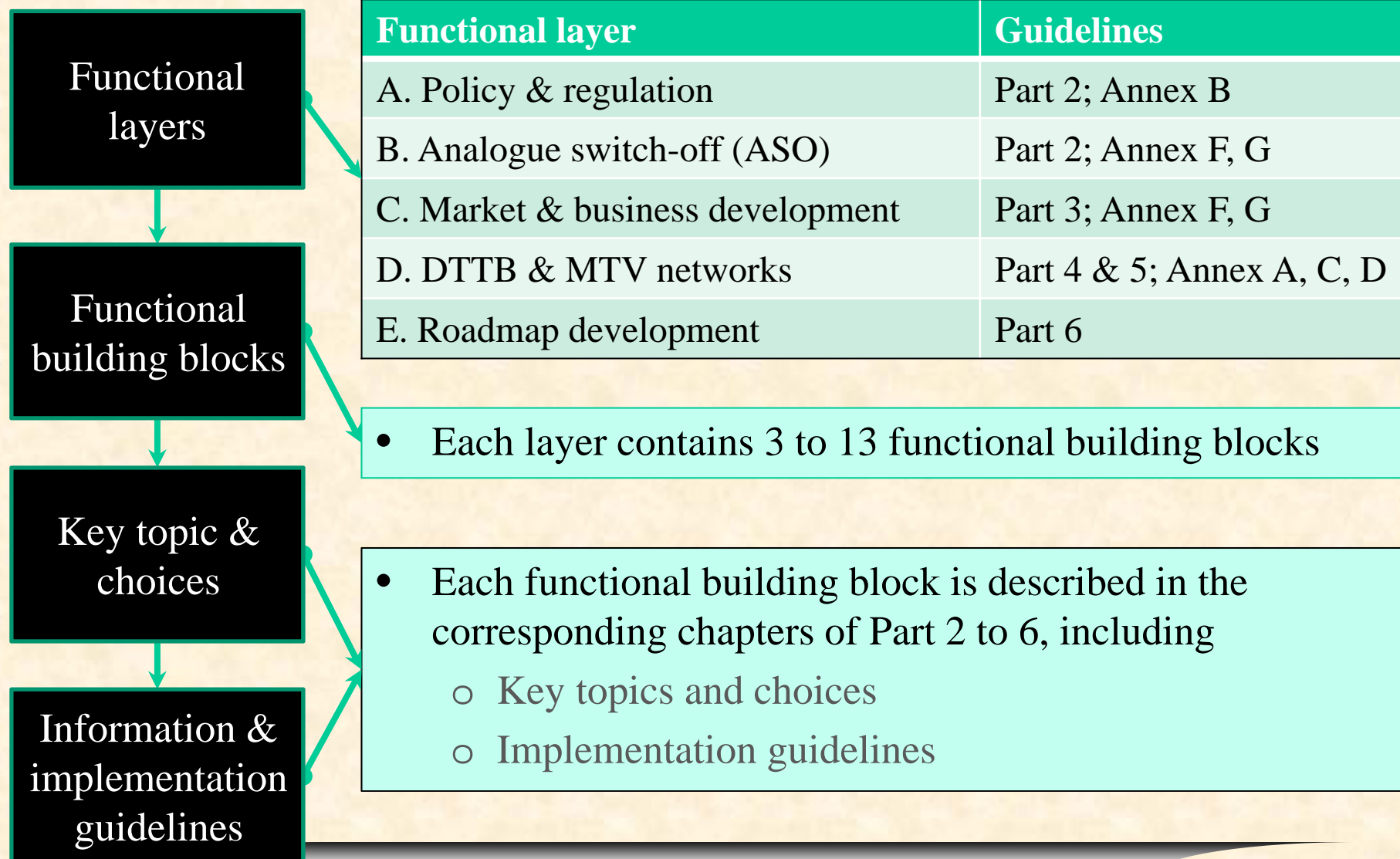
|   |  |   |   |  |  |  |                               |
|---|--|---|---|--|--|--|-------------------------------|
| <b>A. Policy &amp; Regulation</b>           | 2.1. Technology & Standards Regulation         | 2.2. Licensing Framework                  | 2.3. ITU-R Regulations                        |  |  |  |                               |
|   | 2.4. National Spectrum Plan                    | 2.5. Assignment Procedures                | 2.6. License Terms & Conditions               | 2.7. Local Permits (building & planning)   | 2.8. Media Permits & Authorizations          |  |                               |
|   | 2.9. Business Models & Public Financing        | 2.10. Digital Dividend                    |   |  |  |  |                               |
|   | 2.11. National Telecom, Broadcast & Media Acts | 2.12. Law enforcement & execution         | 2.13. Communication to consumers & industry   |  |  |  |                               |
| <b>B. ASO</b>                               | 2.14. Transition Models                        | 2.15. Organizational Structure & Entities | 2.16. ASO Planning & Milestones               | 2.17. Infra & Spectrum Compatibility       | 2.18. ASO Communication Plan                 |  |                               |
| <b>C. Market &amp; Business Development</b> | 3.1. Customer Insight & Research               | 3.2. Customer Proposition                 | 3.3. Receiver Availability Considerations     | 3.4. Business Planning                     | 3.5. End Consumer Support                    |  |                               |
| <b>D. Networks</b>                          | DTTB   | 4.1. Technology & Standards Application   | 4.2. Design Principles & Network Architecture | 4.4. System Parameters                     | 4.6. Network Interfacing                     | 4.8. Transmitting equipment Availability | 4.9. Network Rollout Planning |
|   |  | 4.3/5.3. Network Planning                 | 4.5/5.5. Radiation Characteristics            | 4.7/5.7. Shared & Common Design Principles |  |  |                               |
|   | MTV  | 5.1. Technology & Standards Application   | 5.2. Design Principles & Network Architecture | 5.4. System parameters                     | 5.6. Network Interfacing & studio facilities | 5.8. Transmitting equipment Availability | 5.9. Network Rollout Planning |
| <b>E. Roadmap development</b>               | 6.1. DTTB/MTV Roadmap example for regulator    | 6.2. DTTB Roadmap example for operator    | 6.3. MTV Roadmap example for operator         |  |  |  |                               |

= Government led  
 = Market led



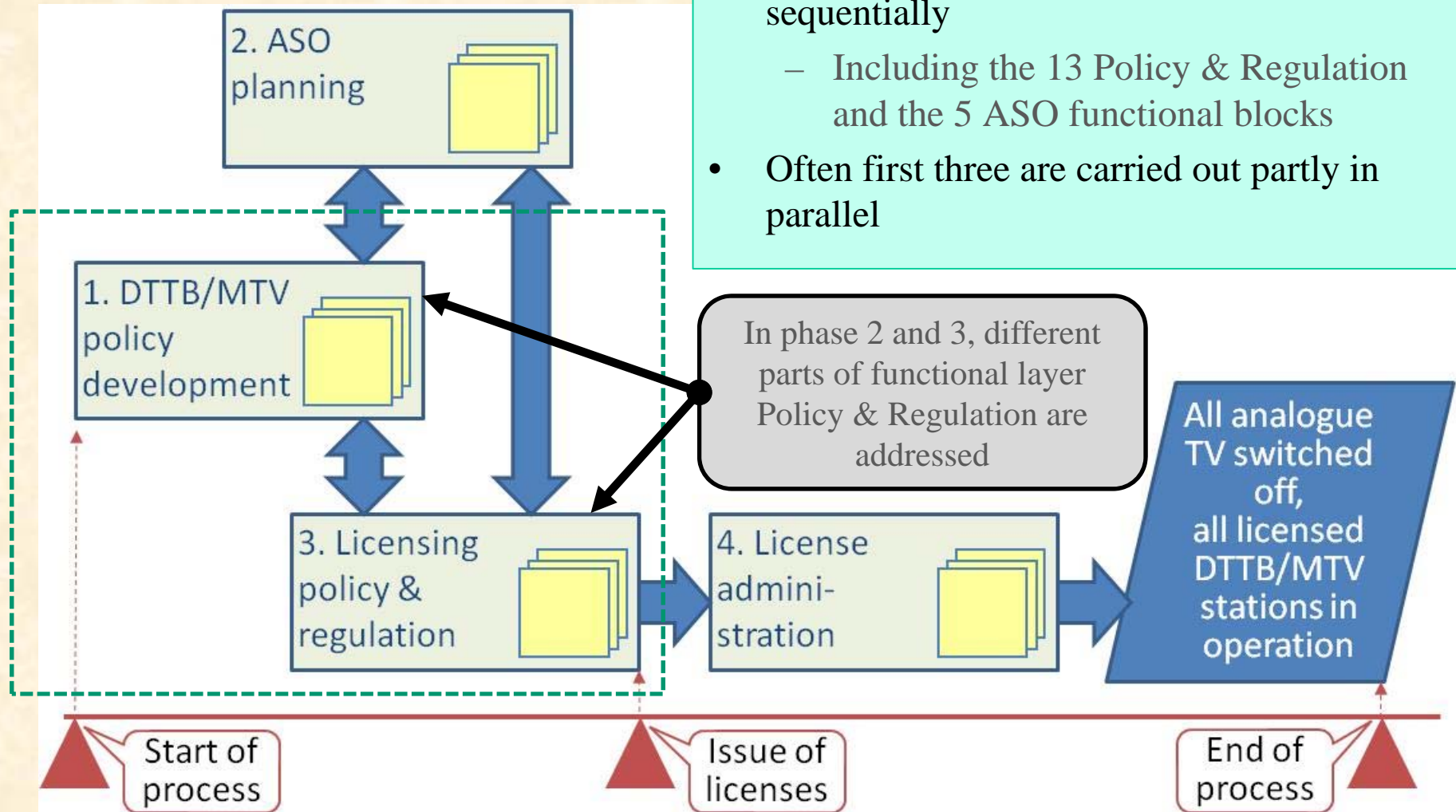


# Functional framework





# Regulator's roadmap



- The four phases can be carried out sequentially
  - Including the 13 Policy & Regulation and the 5 ASO functional blocks
- Often first three are carried out partly in parallel



# Transition Models (2.14)

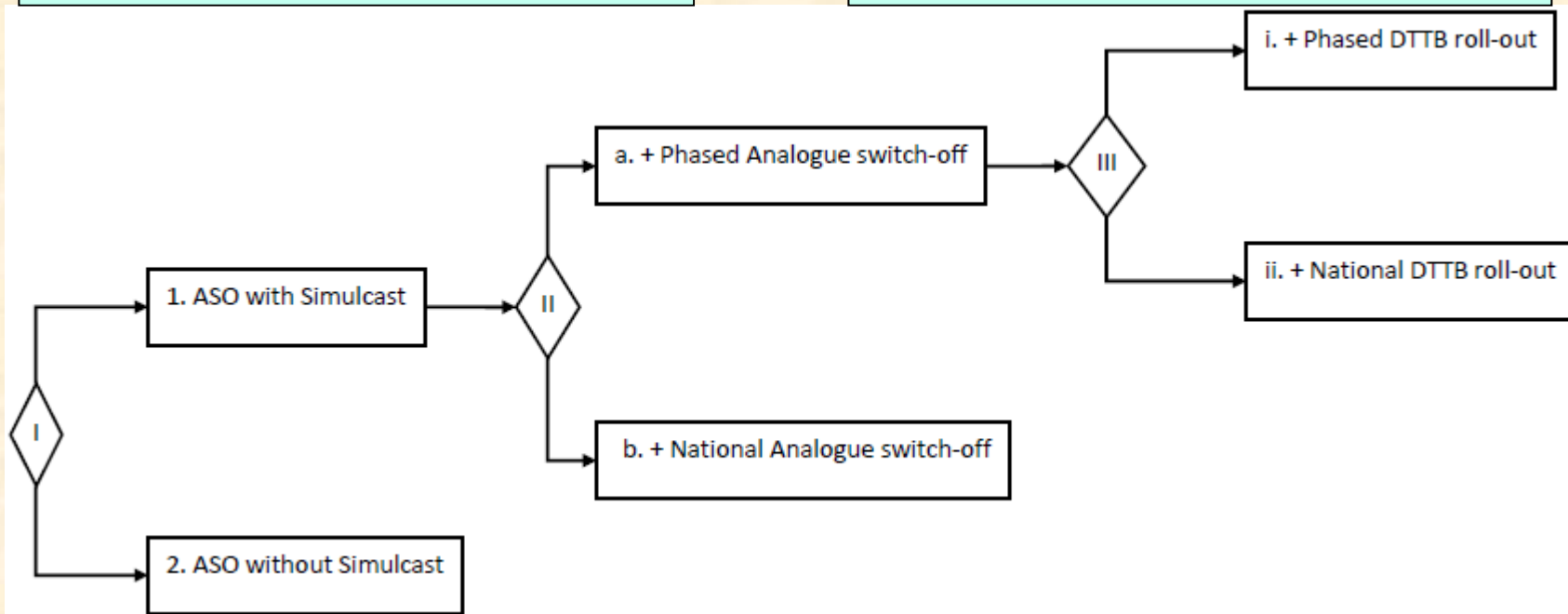
## ASO model factors

1. PSB services
2. # of analogue viewers
3. Spectrum availability
4. DTTB service uptake



## Two basic ASO models

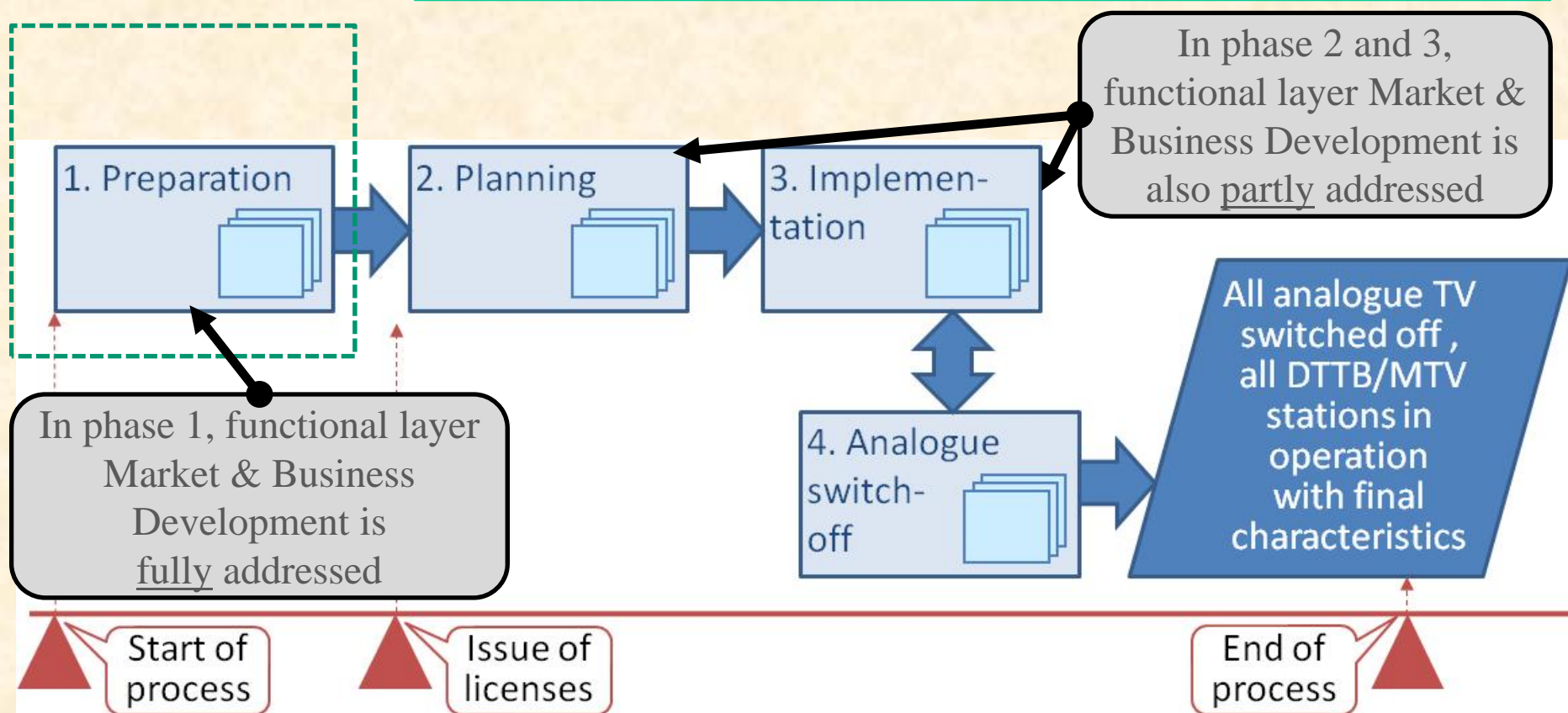
1. ASO with Simulcast:
  - A. Phased
  - B. National
2. ASO without Simulcast





# Operator's roadmap

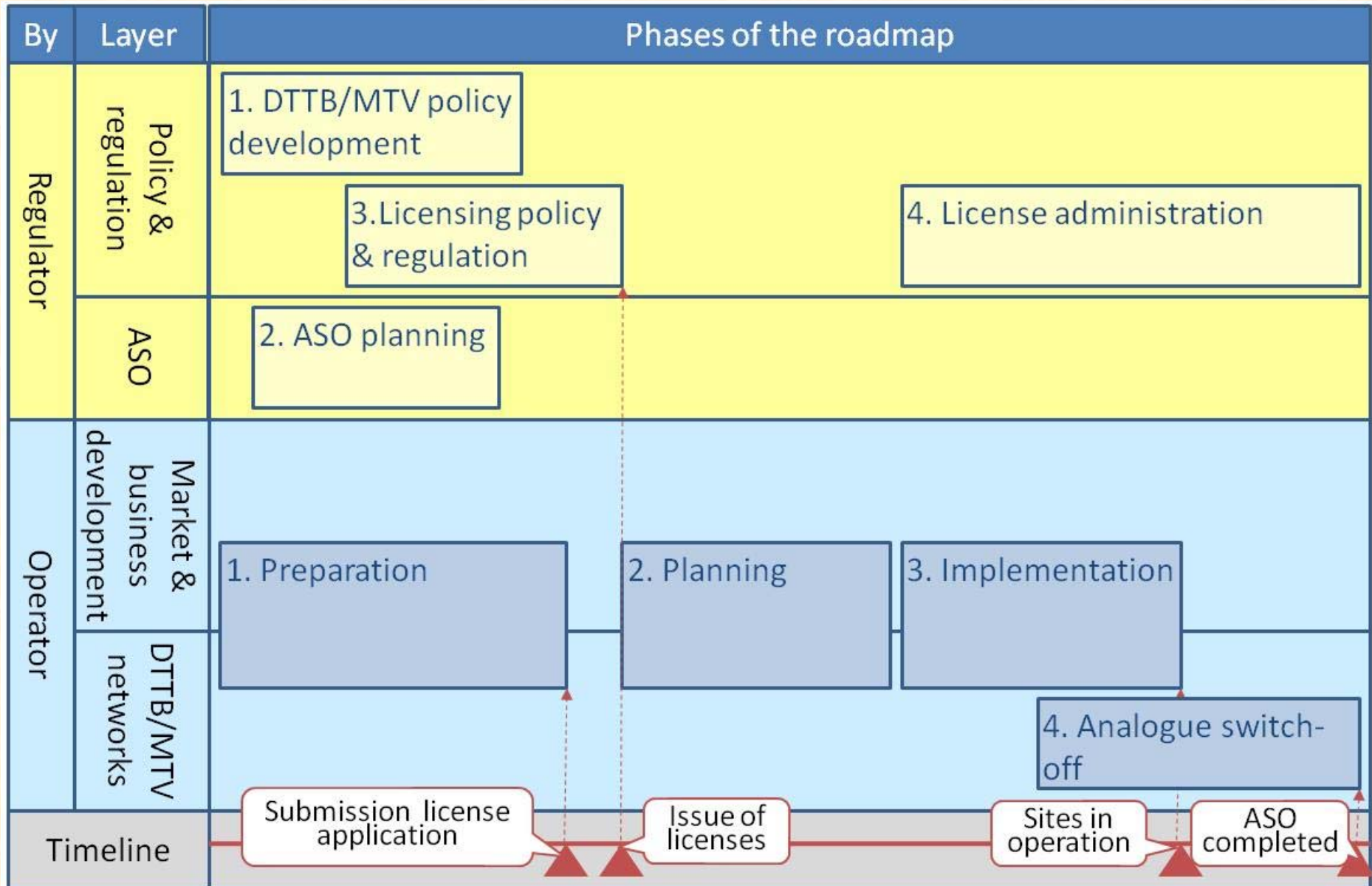
- Phases 1, 2 and 3 are carried out sequentially
- Phase 4 is carried out partly in parallel to 3
  - With coordination to ensure compatible results





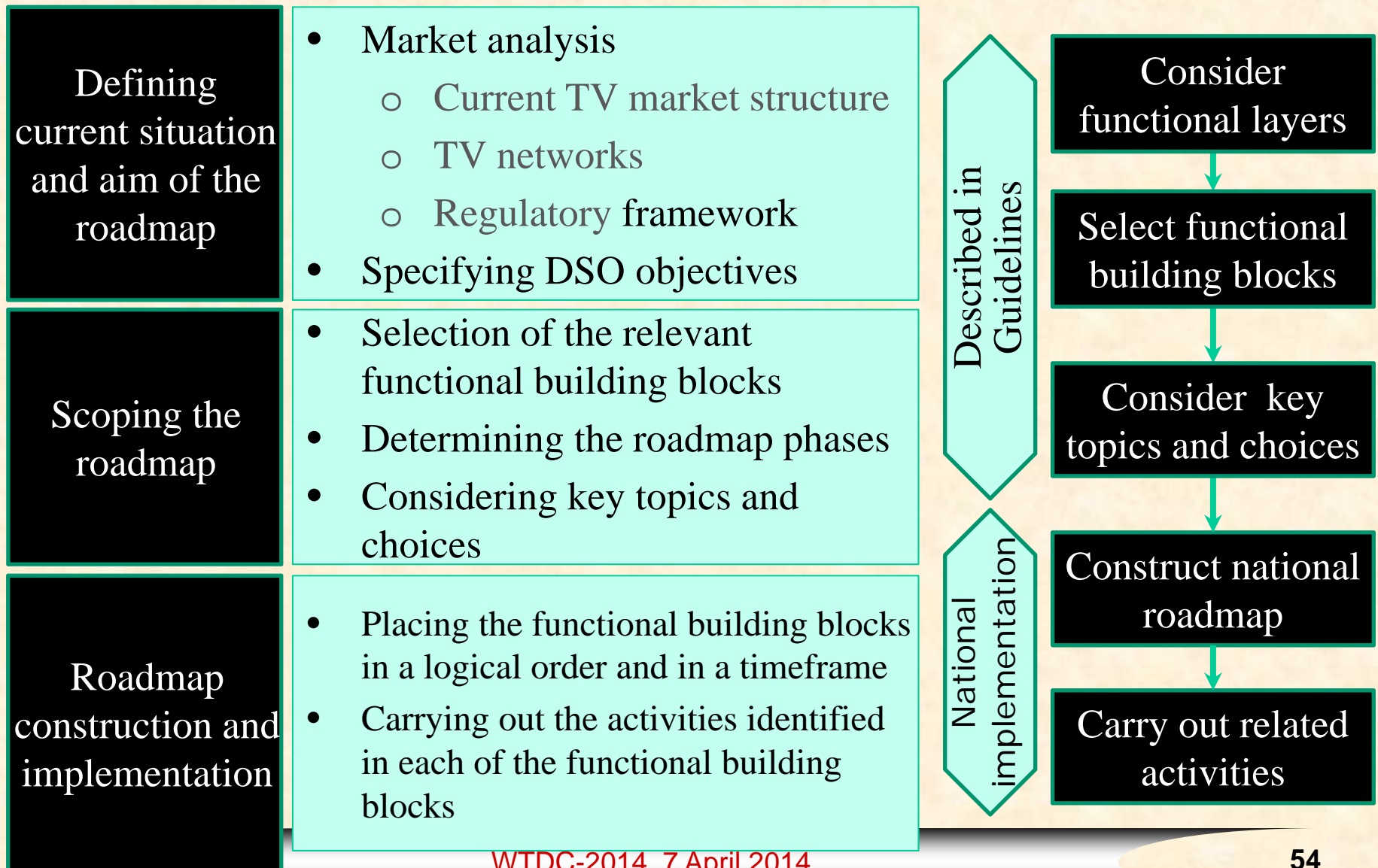


# Roadmap phases example





# National roadmap development






# *Conclusions regarding roadmap development*

Generic roadmaps of whole process of transition to DTTTB and introduction of MTV by Regulator and Operator are given as examples

- National roadmaps may differ, depending on:
  - Market situation
  - Status of implementation
  - Responsibilities and roles of the organization for which the roadmap is made
- It is important to adopt realistic time schedules
  - Implementation of the whole process may take several years and will involve many people

National roadmap development in 7 steps

1. Market analysis
2. Defining DSO objectives
3. Roadmap scoping
4. Defining status of key topics and choices
5. Roadmap construction
6. Defining main activities
7. Selection of top-10 or top-5 main topics



# Conclusions

Transition to DTTB and the introduction of MTV services is a complex process

- Involving decisions on key topics and choices of 41 functional building blocks
- In a practical situation, a number of decisions may have already been taken.
  - Some decisions may need to be reviewed when applying the Guidelines.

Experience has shown a number of essential conditions for a successful transition to DTTB and introduction of MTV services

- Strong leadership of government
- Firm decision of analogue TV switch-off date
- Close cooperation of Regulator and market parties
- Clear and timely regulatory framework (including decisions on the “Digital Dividend”)
- Adequate information and assistance to viewers





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