



Spectrum Management System for Developing Countries (SMS4DC)

Training on SMS4DC

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Livingstone, ZAMBIA

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SPECTRUM LICENSING





SPECTRUM LICENSING AND ASSIGNMENT

- LICENSING/AUTHORIZATION IS THE PROCESS BY WHICH USERS GAIN ACCESS TO THE SPECTRUM RESOURCE. THIS INVOLVE ASSIGNING SPECIFIC FREQUENCIES TO USERS, ALLOTING CERTAIN FREQUENCY BANDS OR SUB-BANDS TO SPECIFIC USERS .
- A COMBINATION OF ADMINISTRATIVE AND TECHNICAL PROCEDURES TO ENSURE THE EFFICIENT OPERATION OF RADIOCOMMUNICATIONS WITHOUT CAUSING INTERFERENCE
- ASSIGNMENT (OF A RADIO FREQUENCY OR RADIO FREQUENCY CHANNEL) IS AUTHORIZATION GIVEN BY AN ADMINISTRATION FOR A RADIO STATION TO USE A RADIO FREQUENCY OR RADIO FREQUENCY CHANNEL UNDER SPECIFIED CONDITIONS



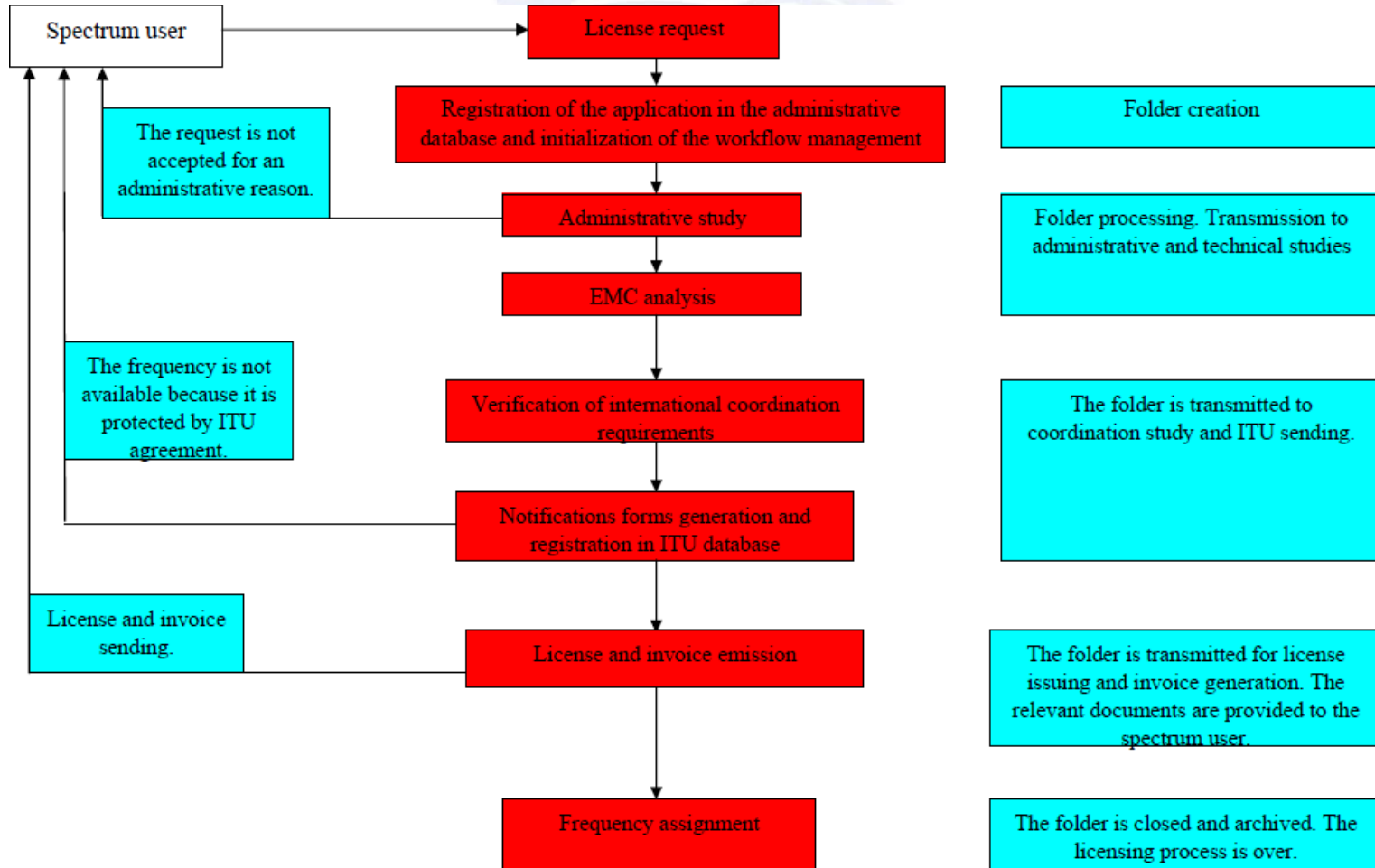


TYPES OF LICENSING

- ADMINISTRATIVE APPROACHES.
 - FIRST-COME, FIRST-SERVED
 - COMPARATIVE REVIEW
 - BID PROCESSES – BEAUTY CONTEST
- MARKET-BASED APPROACHES
 - AUCTIONING
 - SPECTRUM TRADING AND LIBERALIZATION
- UNLICENSED SPECTRUM.



GENERAL PROCEDURE FOR THE FREQUENCY ASSIGNMENT AND LICENSING PROCESS





ADMINISTRATIVE FUNCTIONS OF SMS4DC

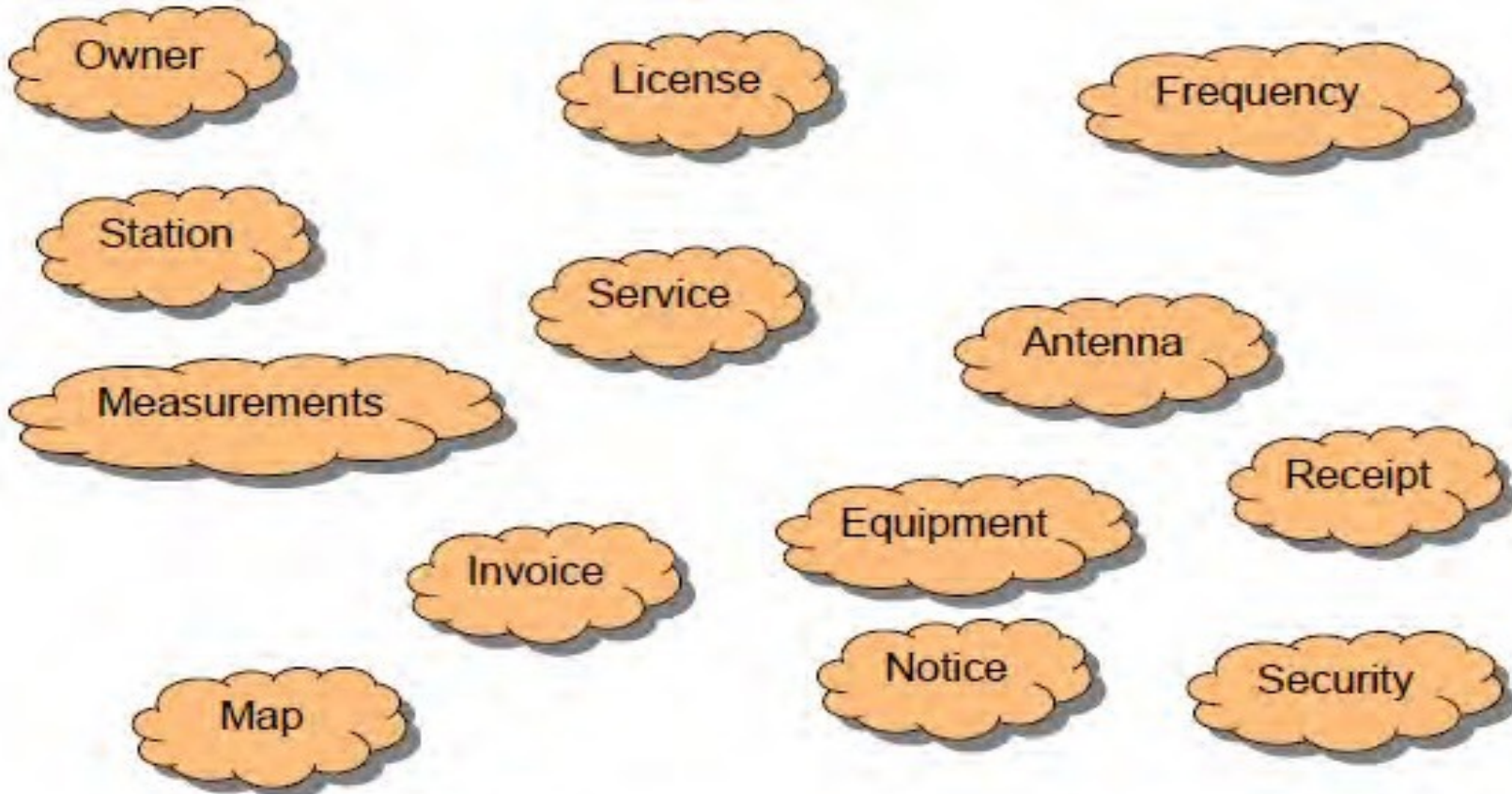
SMS4DC IS POWERED BY A DATABASE WITH A RELATIONAL STRUCTURE THAT STARTS FROM THE LICENSE-OWNERSHIP AND PROCEEDS TO THE DETAILED SPECIFICATION OF RADIOCOMMUNICATION STATIONS IN THE FIXED, LAND MOBILE AND BROADCASTING (SOUND AND TV) SERVICES AND ALSO FOR EARTH STATIONS IN THE SPACE SERVICES.

TREE-VIEW REPRESENTATION METHOD IS USED THAT PROVIDES THE USER WITH TOOLS FOR THE :

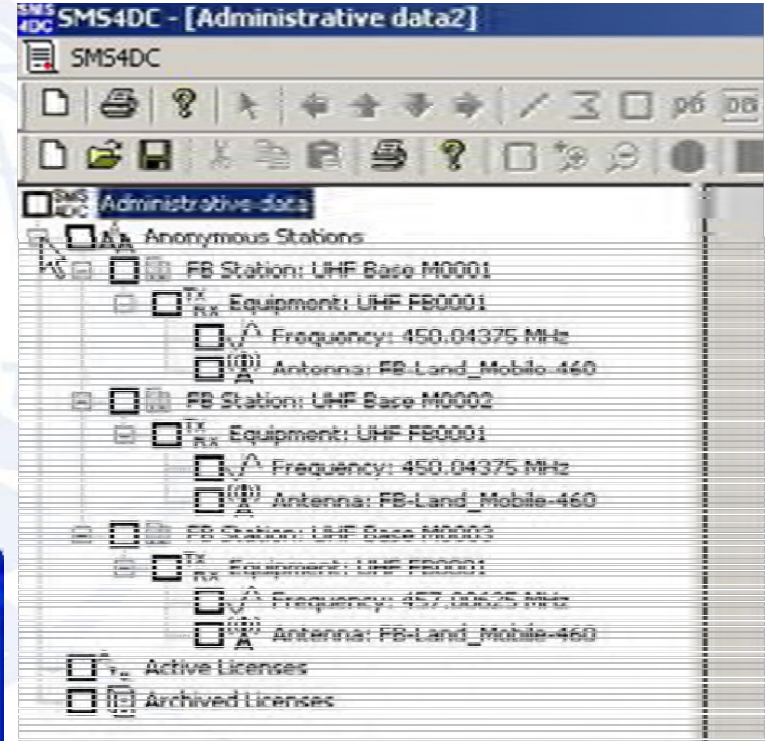
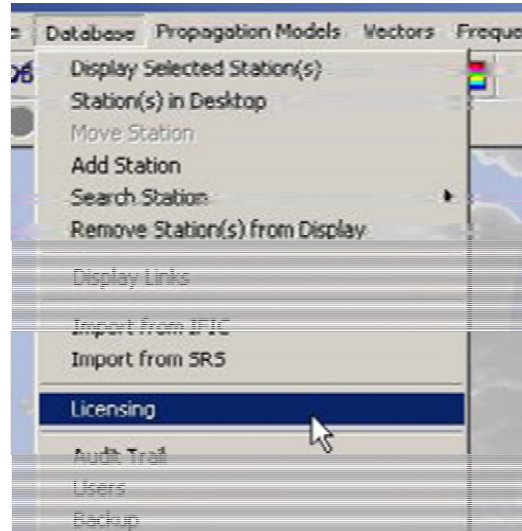
- ADMINISTRATION OF LICENSEES' INFORMATION,
- ESTABLISHMENT, MODIFICATION AND EXPANSION OF RADIOCOMMUNICATION NETWORKS,
- ISSUING AND MODIFICATION OF RADIO LICENSES,
- INVOICING OF SPECTRUM FEES AND RECORDING THE PAYMENT HISTORY OF USERS,
- ITU BR PROCEDURES FOR NOTIFICATION OF FREQUENCY ASSIGNMENTS AND ALLOTMENTS,
- TRACKING OF LICENSING WORK FLOW,
- ARCHIVING OF LICENSES, AND,
- NAVIGATION REGISTERED FREQUENCY ASSIGNMENTS TO RADIOCOMMUNICATION STATIONS AND REPORTING



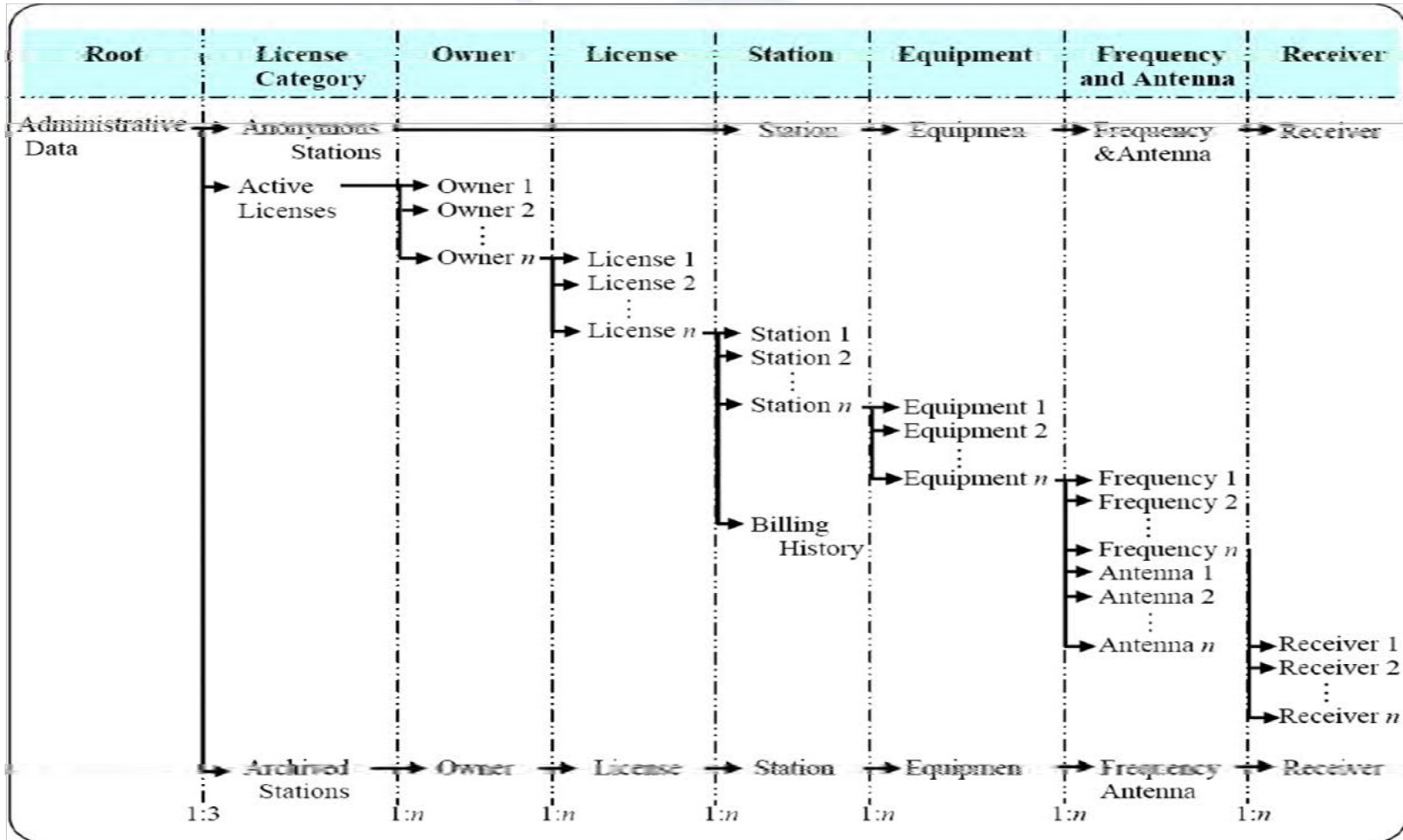
SMS4DC ENTITIES



ACCESS TO SMS4DC LICENSING PROCESS



ADMINISTRATIVE DATA ENTRY FLOW





DATA ENTRY GUIDELINES

- DATA ENTRY IS ENABLED BY PUSHING THE MODIFY BUTTON
- TO ENTER DATA INTO A FIELD:
 - FIRST POSITION THE CURSOR INTO THE REQUIRED FIELD,
 - PRESS <ENTER> TO ACTIVATE THE FIELD
 - PRESSING <ENTER> TO SAVE THE DATA
- ALL THE CODES AND SYMBOLS USED IN SMS4DC CONFORM TO ITU PROCEDURES, DOCUMENTS OR RECOMMENDATIONS





SMS4DC LICENSE CATEGORY

- **ANONYMOUS STATIONS:** A FOLDER CONTAINING ALL ANONYMOUS STATIONS WHICH HAVE BEEN ALREADY CREATED OUTSIDE THE ADMINISTRATIVE WINDOW OF SMS4DC AND CAN BE MOVED TO A LICENSE FOLDER OF AN OWNER IN THE FOLDER OF ACTIVE LICENSES.
- **ACTIVE LICENSES:** FOLDER WHICH HOLDS ALL ACTIVE AND GRANTED LICENSES. THIS FOLDER CONTAINS ALL ACTIVE OWNERS WITH THEIR INFORMATION IN LOWER HIERARCHICAL LEVELS. CREATION OF NEW ADMINISTRATIVE INFORMATION WILL BE DONE INSIDE THIS FOLDER.
- **ARCHIVED LICENSES:** FOLDER WHICH HOLDS ALL CANCELED GRANTED LICENSES



THE LEVEL OF OWNER/ALLOTMENT

SMS4DC

Administrative data

- Anonymous Stations
- FX Station
- FX Station
- FX Station
- BC Station
- BC Station: AGREEMENTS-TEST1
- BC Station: ELDABA- BC station
- BC Station: GEBEIT FX Station
- BC Station: TEST1
- BC Station: TEST2
- ES Station: ELDABA-1
- ES Station: GEBEIT-2
- Active Licenses
- Archived Licenses

Context menu:

- New Owner
- New Allotment
- Delete Selection
- Refresh

Owner information

Modify | Cancel | Save

	Value
Owner Name	NTC
Owner Address	Khartoum - Sudan
City	Khartoum
Country	SDN - Sudan
Telephone	
Telex	
Fax	
Email	
Remarks	
Security Category	
Address Code	SD
Code of Operating Agency	123
Billings	
Billing Name	NTC
Billing Address	Burri - Khartoum - Sudan

Administrative data 1

Administrative data

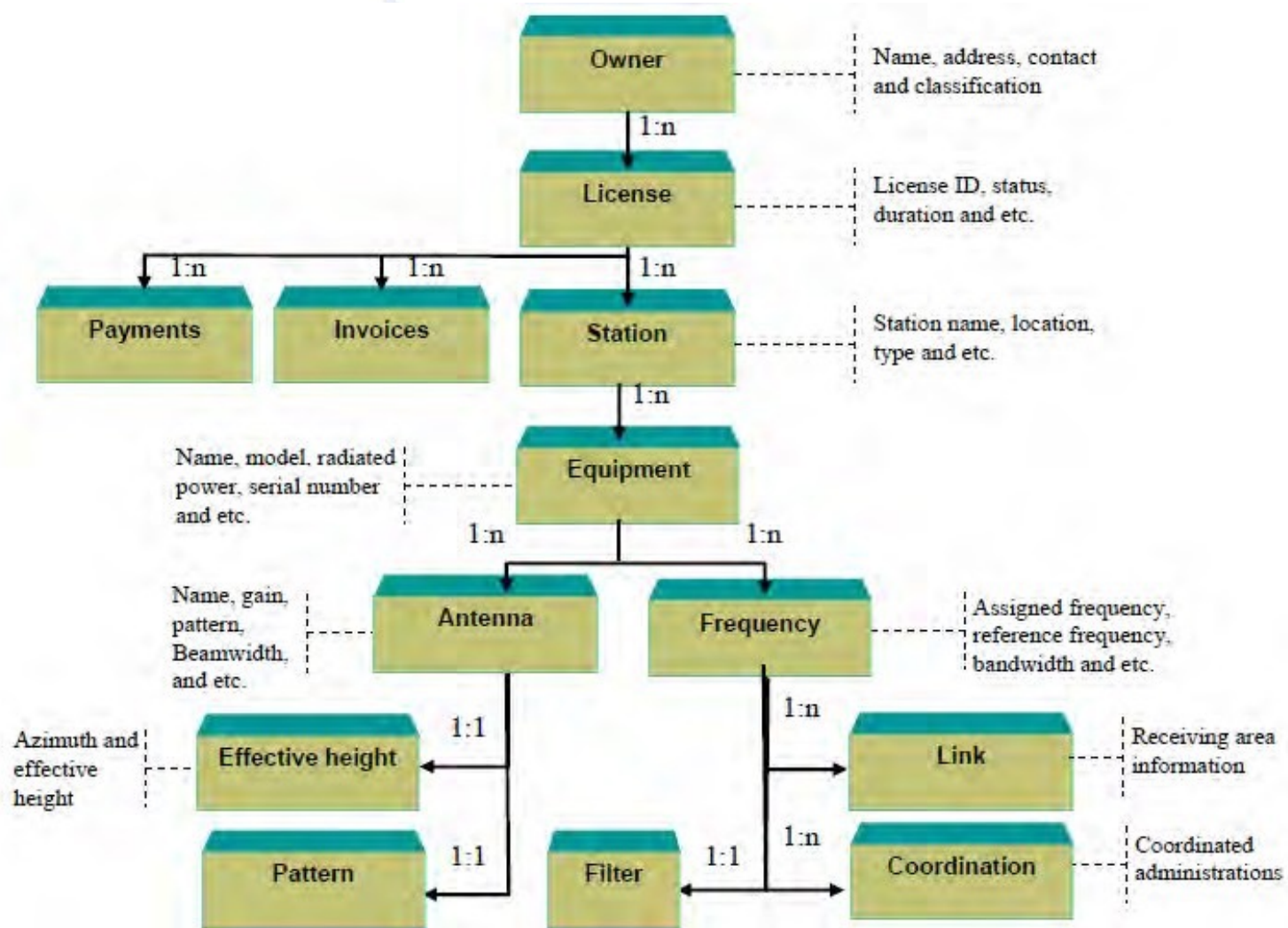
- Anonymous Stations
- Active Licenses
- Archived Licenses

GE06 Allotment information

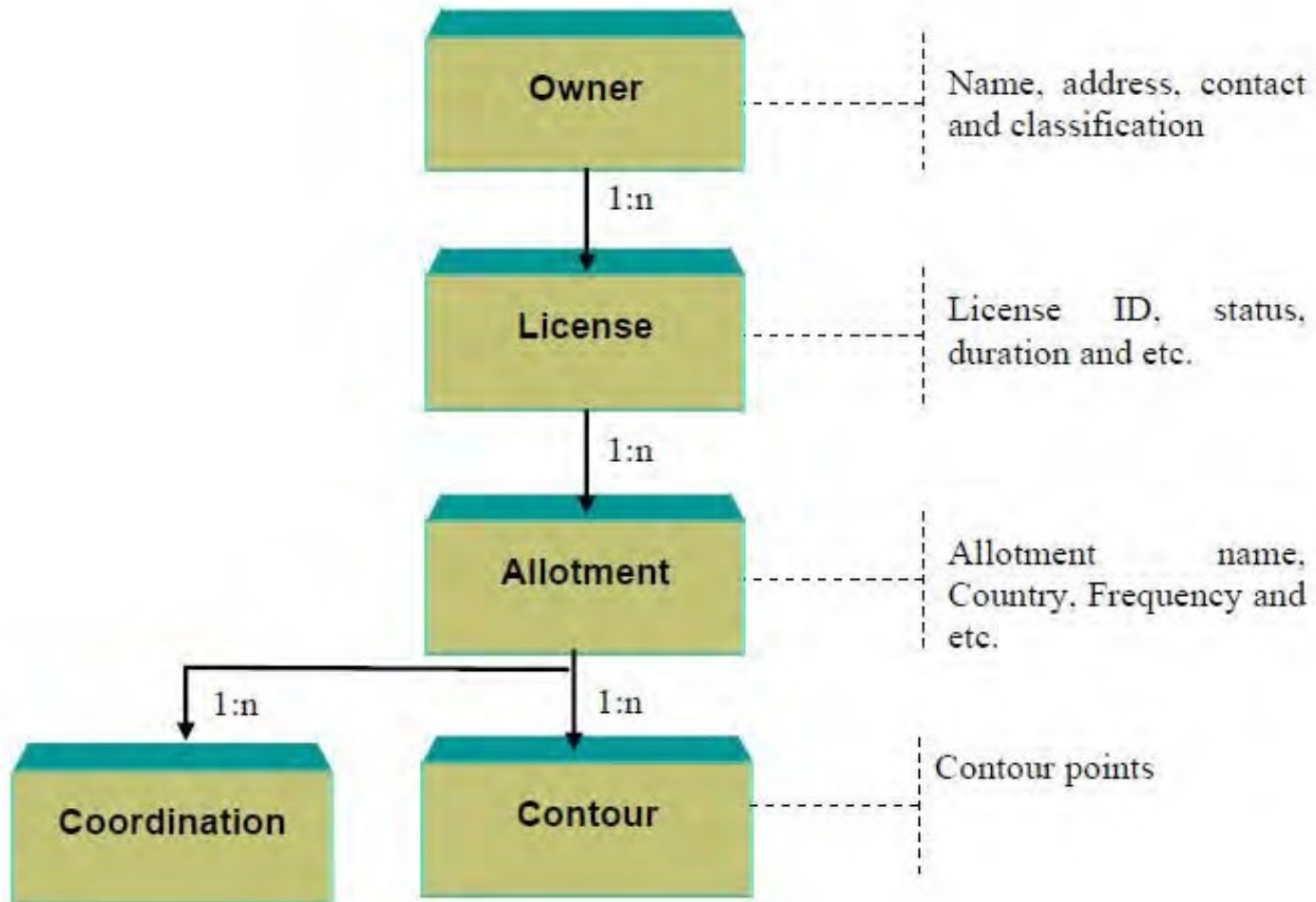
Modify | Cancel | Save

	Value	Unit
Allotment name		
Geographical area		
No. of sub-areas		
Notice Type		
Fragment	GE06D	
Plan entry code		
SFN ID		
Ref. plan config.		
Frequency		MHz
Admin. Ref. ID		
Country		
Class of station		
Polarization		
Reference Network		
Spectrum mask		
Offset		
TV channel		

USER VIEW OF DATA (EXCEPT EARTH STATIONS)



USER VIEW OF DATA (ALLOTMENTS)





SMS4DC DEFINITION OF USER-ID AND PASSWORD

- THE NATURE OF SPECTRUM MANAGEMENT JOB IMPLIES TO GRANT DIFFERENT USERS PERMISSIONS WITH DIFFERENT ACCESS LEVELS TO THE SMS4DC FEATURES AND DATABASE. ACCORDINGLY, FOLLOWING ACCESS LEVELS TO THE SMS4DC SOFTWARE IMPLEMENTED:

- **DATA ENTRY (LICENSING AND BILLING):** PRIVILEGED TO READ/WRITE LICENSING AND BILLING DATABASES,

- **ENGINEERS:** PRIVILEGED TO READ/WRITE TECHNICAL DATABASE,

- **SENIOR OPERATOR:** PRIVILEGED TO MODIFY REFERENCE TABLES.

- **SUPERVISOR:** PRIVILEGED TO READ/WRITE ALL DATABASE, AS WELL AS TO MANAGE USER IDS AND PASSWORDS, REFERENCE TABLES AND TO CONFIGURE AND ENJOY ANY FEATURES OF SOFTWARE,

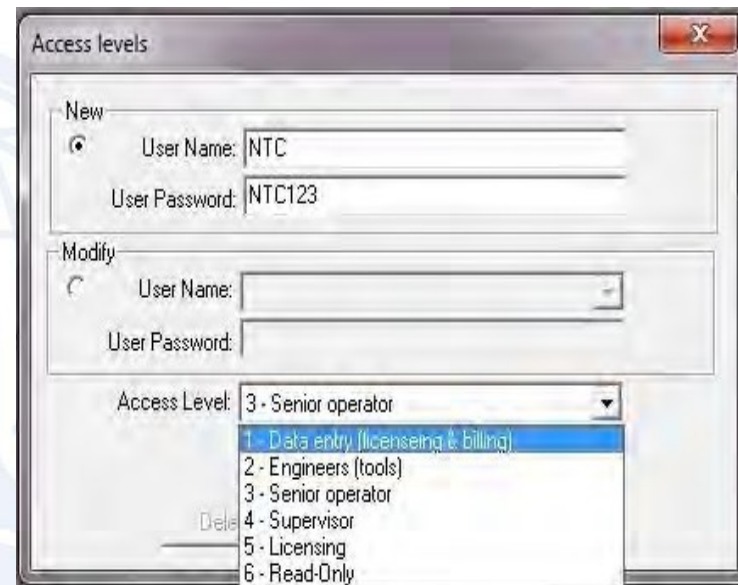
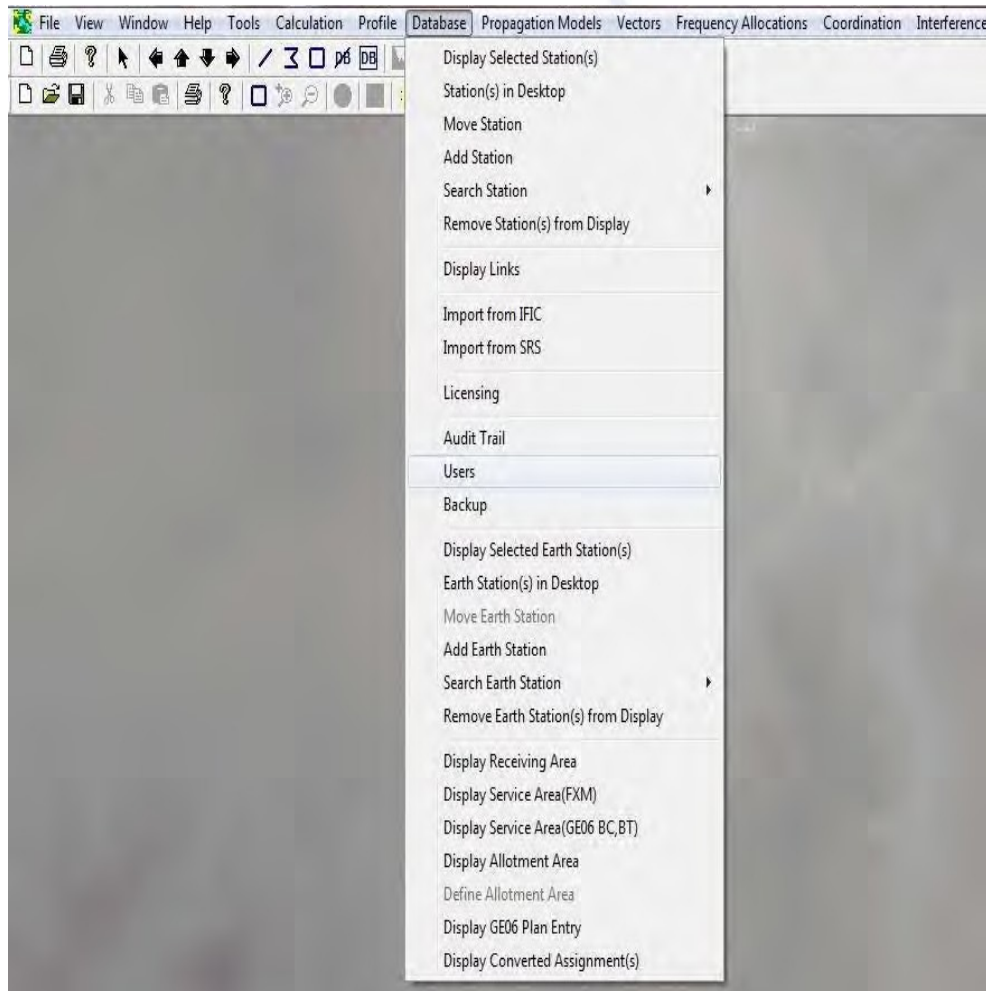
- **LICENSING:** PRIVILEGED TO READ/WRITE DATABASE OF REFERENCE INFORMATION (SUCH AS EQUIPMENT SPECIFICATION, ANTENNA PATTERN, FREQUENCY PLANS AND ETC.) AND TO ONLY READ OTHER DATABASES,

- **READ-ONLY:** PRIVILEGED TO USE SOFTWARE WITHOUT PERMISSION TO EDIT ANY DATABASE,

- ONLY SYSTEM SUPERVISOR, AS ADMINISTRATOR, IS ALLOWED TO DEFINE AND CANCEL USER-ID AND PASSWORD FOR OTHER USERS THROUGH “DATABASE->USERS” ITEM.
- SUPERVISOR HAS OPTION TO CREATE A NEW ACCOUNT OR MODIFY AN EXISTING ACCOUNT BY SELECTING ONE OF THE “NEW” OR “MODIFY” RADIO BUTTONS RESPECTIVELY

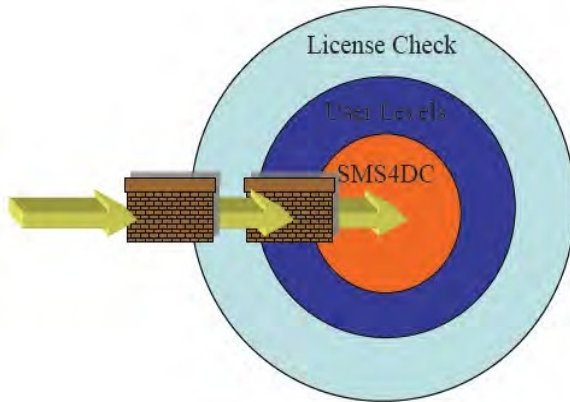


SMS4DC DEFINITION OF USER-ID AND PASSWORD



SMS4DC SECURITY

Audit trail



Audit trail

User Name: Action: Table:

User	Date/Time	Action	Record no.	Table
sms4dc	2012-05-30 09:04:57	Update broadcasting station	1	BCStation
sms4dc	2012-05-30 09:07:12	Update broadcasting station	2	BCStation
sms4dc	2012-06-20 13:40:06	Add owner	1	Owner
sms4dc	2012-06-20 13:43:09	Add license	1	License
sms4dc	2012-06-20 13:43:35	Move broadcasting station from technical	3	BCStation
sms4dc	2012-06-20 13:44:04	Broadcasting licence generated	1	---
sms4dc	2012-06-20 13:47:01	Add first invoice	2	Invoice
sms4dc	2012-06-20 13:47:31	Add payment	2	Payment



THE LEVEL OF OWNER/ALLOTMENT(2)

- **NEW OWNER:** THIS ITEM ENABLES THE USER TO ENTER THE OWNERS PERSONAL AND CONTACT INFORMATION IN THE TABLE OF OWNER INFORMATION.
- **MODIFY OWNER:** THIS ITEM MODIFIES THE CONTENT OF THE OWNER INFORMATION
- **DELETE OWNER:** THIS ITEM DELETES THE OWNER INFORMATION AND ALL OTHER ATTACHED INFORMATION IN THE LOWER LEVELS OF TREE VIEW IF HAS NO LICENSE GRANTED
- **NEW LICENSE:** THIS ITEM CREATES A NEW LICENSE PLATFORM AND ATTACHES IT TO THE CORRESPONDING OWNER.
- **NEW ALLOTMENT:** THIS ITEM ENABLES USER TO ENTER DIGITAL BROADCASTING FREQUENCY ALLOTMENT INFORMATION.
- **DELETE SELECTION:** IN THE TREE VIEW, THERE IS A CHECK BOX BESIDE EACH TREE ITEM



THE LEVEL OF OWNER/ALLOTMENT(3)

SMS4DC

Administrative data

- Anonymous Stations
 - FX Station: GEBEIT Fixed
 - FX Station: P2P_TEST1
 - FX Station: P2P_TEST2
 - BC Station: AGREEMENT_TEST2
 - BC Station: AGREEMENTS-TEST1
 - BC Station: ELDABA- BC station
 - BC Station: GEBEIT FX Station
 - BC Station: TEST1
 - BC Station: TEST2
 - ES Station: ELDABA-1
 - ES Station: GEBEIT-2
- Active Licenses
 - Owner: **NTC**
- Archive

Context menu for Active Licenses:

- Modify
- Delete
- New License

License information

Modify Cancel Save

	Value
License No	1
Beginning of Use	2012/06/20
Expiration Date	2013/06/20
Status	Data entry
Service ID	B - Broadcasting
<i>Billing</i>	
Invoice Period	Annually
Initial Fee	1000

THE LEVEL OF LICENSE



- Modify
- Delete
- Copy to Archive
- Cancel license
- Add Broadcasting Station
- Add Allotment
- Move Anonymous Station
- Move Anonymous Allotment
- Print License
- Print Summary

Select a station to move to license

Site ID	Station Name	Latitude	Longitude	Class of Stat
SDN_TEST1	TEST1	18.15	29.025	BC
	TEST2	18.25	29.475	BC
	AGREEMENT	17.5	30.525	BC
	AGREEMENT	8.05	35.916667	BC
ELDABA- BC	ELDABA- BC	17.9	31.05	BC
	GEBEIT FX S	18.858333	36.65	BC

OK Cancel



THE LEVEL OF LICENSE (2)

- THE LEVEL OF LICENSE COMES BETWEEN THE OWNER LEVEL AND THE STATION LEVEL
- EACH LICENSE MAY CONSIST OF SEVERAL STATIONS IN SAME RADIOCOMMUNICATION SERVICE
- THE STATION SERVICE TYPE HAS TO BE DETERMINED AT THE LICENSE LEVEL
- CONTEXT MENU IN THE LEVEL OF LICENSE:
 - **MODIFY:** THIS ITEM MODIFIES THE CONTENT OF THE LICENSE INFORMATION TABLE IF HAS NOT BEEN GRANTED ALREADY
 - **DELETE:** THIS ITEM DELETES THE LICENSE INFORMATION AND ALL OTHER ATTACHED INFORMATION IN THE LOWER LEVELS OF TREE VIEW, IF HAS NOT BEEN GRANTED ALREADY. GRANTED LICENSES CANNOT BE DELETED.
 - **COPY TO ARCHIVE:** THIS ITEM SAVES A DUPLICATE COPY OF THE SELECTED LICENSE IN THE ARCHIVE





THE LEVEL OF LICENSE (3)

- **CANCEL LICENSE:** THIS ITEM CANCELS A GRANTED LICENSE FROM THE OWNER INFORMATION
- **ADD XXXX STATION:** THIS ITEM ADDS A STATION IN THE XXXX RADIOCOMMUNICATION SERVICE TO THE SELECTED LICENSE,. THIS ITEM IS INCLUDED IS INCLUDED ACCORDING TO THE PARENT LICENSE TYPE.
- **MOVE ANONYMOUS STATION:** THIS ITEM MOVES A STATION FROM THE FOLDER OF “ANONYMOUS STATIONS” TO THE ACTIVE LICENSE.
- **MOVE ANONYMOUS ALLOTMENT:** THIS ITEM MOVES AN ALLOTMENT FROM THE FOLDER OF “ANONYMOUS STATIONS” TO THE ACTIVE LICENSE.
- **PRINT LICENSE:** THIS ITEM GENERATES AND DISPLAYS A PRINTABLE RADIO LICENSE IN HTML FORMAT, USING A CUSTOMIZABLE TEMPLATE.
- **PRINT SUMMARY:** THIS ITEM GENERATES AND DISPLAYS AN INDENTED TEXT FILE CONTAINING ALL THE INFORMATION UNDER THE CORRESPONDING LICENSE.



FIXED/BASE STATION INFORMATION ENTRY TABLE

Administrative data 1
_ □ ×

SMS 4DC Administrative data

Anonymous Stations

Active Licenses

Owner: BEL 1

License: BEL 1

Owner: G1

Owner: MRC 1

Owner: POR 1

Owner: SPAIN 1

Archived Licenses

Fixed/Base station information

Modify

	Value	Unit
Admin Ref. ID		
Site ID		
Station Name		
Call Sign		
Class of Station		
Station Type	Fixed	
<i>Location</i>		
ITU region		
Latitude		+DDMMSS.SS
Longitude		+DDDMMSS.SS
Country		
Radius of Service		km
Height ASL		m
<i>Misc.</i>		
Provision		
Area of Trans.		
Network ID		
Target Latitude		+DDMMSS.SS
Target Longitude		+DDDMMSS.SS
Type of Notice	T11	

MOBILE STATION INFORMATION ENTRY TABLE

Administrative data1

SMS 4DC Administrative data

Anonymous Stations

Active Licenses

- Owner: BEL 1
- Owner: G1
 - License: G1
- Owner: MRC1
- Owner: POR 1
- Owner: SPAIN 1

Archived Licenses

Mobile station information

	Value	Unit
Admin Ref. ID		
Mobile ID		
Mobile Name		
Call Sign		
Class of Station		
Station Type	Mounted	
<i>Location</i>		
ITU Region		
Latitude		+DDMMSS.SS
Longitude		+DDDMMSS.SS
Country		
Radius of Service		km
Area of Trans.		
<i>Misc.</i>		
Number of Sets		
Provision		
Network ID		
<i>Vehicle</i>		
Vehicle Model		
Vehicle Plate		
Vehicle Color		
Type of Notice		



BROADCASTING STATION INFORMATION ENTRY TABLE

Administrative data1

- SMS 4DC Administrative data
- Anonymous Stations
- Active Licenses
 - Owner: Test
 - License: BC001
- Archived Licenses

Broadcasting station information

Modify Cancel Save

	Value	Unit
Admin Ref. ID		
Site ID		
Station Name		
Call Sign		
Class of Station		
Station Type	Fixed	
<i>Location</i>		
ITU Region		
Latitude		+DDMMSS.SS
Longitude		+DDDMMSS.SS
Country		
Radius of Service		km
Height ASL		m
<i>Misc.</i>		
Provision		
Plan		
Target Latitude		+DDMMSS.SS
Target Longitude		+DDDMMSS.SS
<i>Geneva 06</i>		
Plan Entry Type		
Assignment Code		
Assoc. Allot. ID		
Assoc. Allot. SFN ID		
SFN ID		
Conditions Met		
Signed Commitment		
Type of Notice	T01	





THE LEVEL OF STATION

DIFFERENT TABLES OF EQUIPMENTS HAVE BEEN DEVELOPED FOR DIFFERENT CLASSES OF STATIONS:

- **MODIFY:** THIS ITEM MODIFIES THE CONTENT OF THE STATION INFORMATION TABLE IF HAS NOT BEEN INCLUDED PREVIOUSLY IN ANY GRANTED LICENSE
- **DELETE:** THIS ITEM DELETES THE STATION INFORMATION AND ALL OTHER ATTACHED INFORMATION IN THE LOWER LEVELS OF TREE VIEW, IF HAS NOT BEEN INCLUDED IN ANY GRANTED LICENSE
- **ELECTRONIC NOTICE:** THIS ITEM GENERATES, STORES AND DISPLAYS AN ELECTRONIC NOTICE TO NOTIFY THE ITU BR OF THE ASSIGNED FREQUENCY(S) OR ADMINISTRATIVE MODIFICATION(S)
- **NEW EQUIPMENT:** THIS ITEM DEFINES NEW EQUIPMENT OR LOADS IT FROM THE EQUIPMENT CATALOGUE LIBRARY TO THE CURRENT STATION





THE LEVEL OF BILLING HISTORY

THE LEVEL OF BILLING HISTORY PLACED BELOW THE LEVEL OF LICENSE AND NO LOWER LEVEL CONNECTED

- SMS4DC PROVIDES THE USER WITH A PROCEDURE FOR REGULAR FREQUENCY-FEE PAYMENT MANAGEMENT .
- EACH LICENSE HAS AN INDIVIDUAL BILLING HISTORY WHICH IS BEING CREATED BY SMS4DC IN THE TIME CREATION RELEVANT LICENSE.
- BY A MOUSE CLICK OR OTHER ACTION, DISPLAYS A LIST OF ISSUED INVOICES AND REGISTERED PAYMENTS FOR THE CORRESPONDING LICENSE IN THE RIGHT PANEL OF ADMINISTRATIVE WINDOW.
- A PRINT BUTTON AT THE TOP OF THE TABLE HAS BEEN IMPLEMENTED TO PRINT THE SELECTED INVOICE OR RECEIPT OF PAYMENT IN HTML FORMAT.



BILLING INFORMATION TABLE AND PAYMENT REGISTRATION IN BILLING HISTORY

Administrative data1

SMS 40C Administrative data

- Anonymous Stations
- Active Licenses
 - Owner: Admin1
 - License: 456
 - License: 12345
 - Billing History**
 - FX Station: Left Site
 - FX Station: Tehran1
 - FX Station: KosovaSta
 - FX Station: Mecca1
 - FX Station: Saqez1
 - FX Station: KABOUL
 - License: 123
 - Owner: Admin2
 - Owner: Another owner
 - Owner: Sample audit
 - Owner: ministry of ICT
 - Owner: Test owner
 - Owner: asdfasdf
- Archived Licenses

Billing information

Print

Bill no.	Date	Description	Debit	Credit	Balance
12345	2004/11/23	Invoice:	80000	0	-80000
234	2004/12/24	Invoice:	35500	-80000	-115500
6543	2004/12/25	Payment:	0	150000	34500
0000100003	2005/01/24	Invoice: Generated on 2005/10/09	20749	34500	13751
0000100004	2005/02/24	Invoice: Generated on 2005/10/09	20749	13751	-6998
0000100005	2005/03/24	Invoice: Generated on 2005/10/09	20749	-6998	-27747
0000100006	2005/04/24	Invoice: Generated on 2005/10/09	20749	-27747	-48496
0000100007	2005/05/24	Invoice: Generated on 2005/10/09	20749	-48496	-69245
0000100008	2005/06/24	Invoice: Generated on 2005/10/09	20749	-69245	-89994
0000100009	2005/07/24	Invoice: Generated on 2005/10/09	20749	-89994	-110743
0000100010	2005/08/24	Invoice: Generated on 2005/10/09	20749	-110743	-131492
0000100011	2005/09/24	Invoice: Generated on 2005/10/09	20749	-131492	-152241
33567	2005/10/23	Payment: Partial payment	0	105000	-47241
0000100012	2005/10/24	Invoice: Generated on 2005/10/25	35712	-47241	-82953

Payment

Payment No.: Date: 29/11/2012

Description:

Payment amount: 0

Save Cancel



CONTEXT MENU IN THE LEVEL OF BILLING HISTORY

- **FIRST INVOICE:** THIS ITEM ISSUES THE FIRST INVOICE WHICH OWNER HAS TO PAY INCLUDING THE INITIAL FEE (DETERMINED IN THE ENTRY TABLE OF LICENSE INFORMATION) FOR OBTAINING A RADIO LICENSE.
- **NEW PAYMENT:** THIS ITEM REGISTERS THE PAYMENT AND CONSIDERS IT IN THE BILLING HISTORY OF OWNER OF THE ACTIVE LICENSE.



THE LEVEL OF EQUIPMENT

THE LEVEL OF EQUIPMENT IS PLACED BETWEEN THE TERRESTRIAL STATION LEVEL AND THE FREQUENCY AND ANTENNA LEVEL

EACH EQUIPMENT MAY HAVE SEVERAL FREQUENCIES AND ANTENNAS

- **MODIFY:** THIS ITEM MODIFIES THE CONTENT OF THE EQUIPMENT INFORMATION TABLE IF IT HAS NOT BEEN ALREADY INCLUDED IN ANY GRANTED LICENSE.
- **DELETE:** THIS ITEM DELETES THE EQUIPMENT INFORMATION AND ALL OTHER ATTACHED INFORMATION IN THE LOWER LEVELS OF TREE VIEW, IF HAS NOT BEEN INCLUDED IN ANY GRANTED LICENSE
- **NEW ANTENNA:** THIS ITEM DEFINES A NEW ANTENNA OR LOADS IT FROM THE ANTENNA CATALOGUE LIBRARY TO THE CURRENT EQUIPMENT.
- **NEW FREQUENCY:** THIS ITEM DEFINES A NEW FREQUENCY



FREQUENCY INFORMATION ENTRY TABLE

SMS4DC - [Administrative data1]

SMS4DC

Administrative data

- Anonymous Stations
- Active Licenses
 - Owner: FM broadcasting
 - License: fm broadcasting
 - Billing History
 - BC Station: Elbasira Radio
 - TX Equipment:
 - BC Station: Elgwat Elmoslaha Radio
 - TX Equipment:
 - BC Station: Elkoser
 - TX Equipment: elkoser
 - BC Station: Elrabia Radio
 - TX Equipment: **Frequency: 94. MHz**
 - Antenna: DEFAULT
 - BC Station: Khartoum Radio
 - TX Equipment:
 - BC Station: Kother Radio
 - TX Equipment:
 - BC Station: Masa Radio
 - TX Equipment:
 - BC Station: Omdurman Radio
 - TX Equipment:
 - BC Station: Omdurman Radio
 - TX Equipment:
 - BC Station: Open University of Sudan
 - TX Equipment:
 - Frequency: 89.5 MHz
 - Antenna: DEFAULT
 - BC Station: Quran
 - TX Equipment:
 - BC Station: Quran Radio
 - TX Equipment:
 - BC Station: rabia94 khartoum
 - TX Equipment:
 - BC Station: Sawa Radio
 - TX Equipment:

Frequency information

Modify Cancel Save Add receiver

| | Value | Unit |
|---------------------------|-------|------|
| Assigned Frequency | 94. | MHz |
| <i>Misc</i> | | |
| Class of Emission | F3E-- | |
| Band Width | 300.0 | kHz |
| Channel Separation | 0.0 | kHz |
| Traffic | 0.0 | |
| Peak Hour | | UTC |
| Season | | |
| Nature of Service | CP | |
| Op. Hour (From) | 00:00 | UTC |
| Op. Hour (To) | 24:00 | UTC |
| <i>Fee</i> | | |
| Frequency Fee | 0 | |
| Target Frequency | | MHz |
| Type of Spectrum Mask | 1 | |
| Frequency Offset | 0 | kHz |





LEVEL OF FREQUENCY

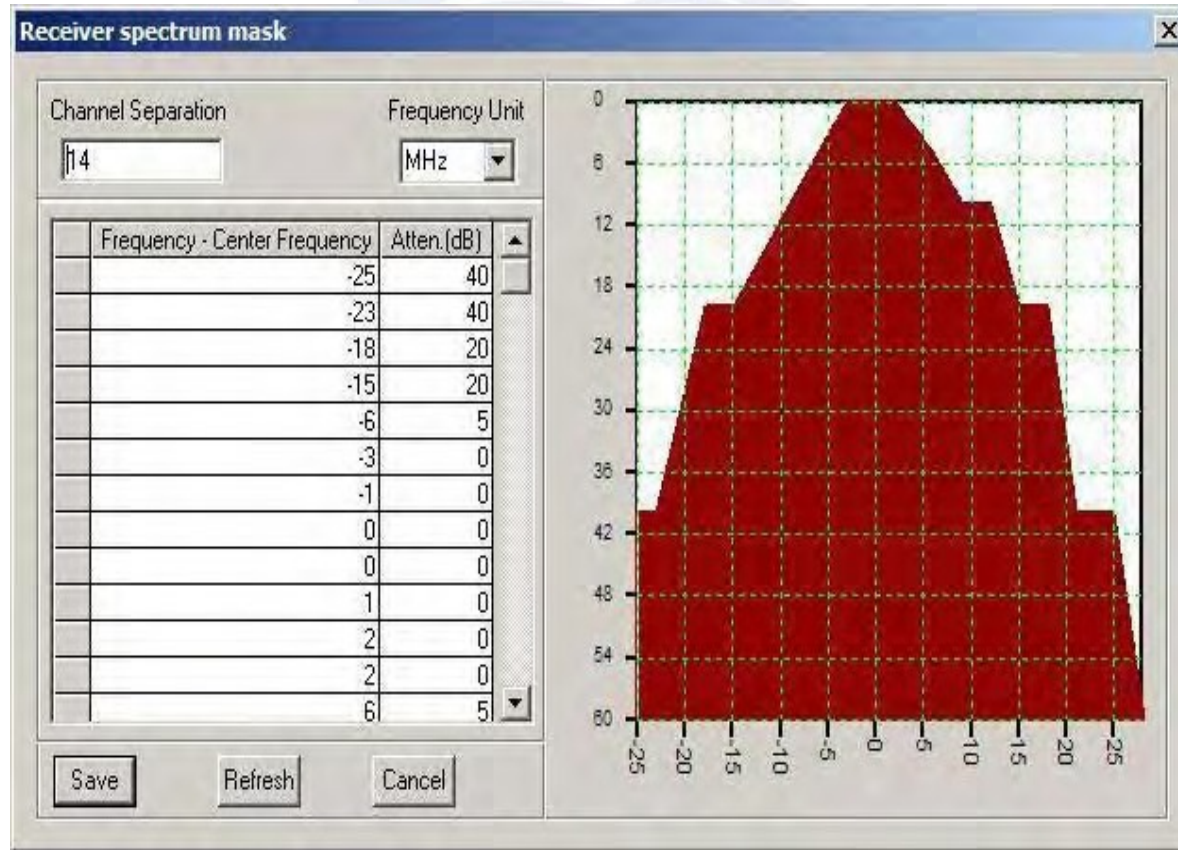
THE LEVEL OF FREQUENCY IS PLACED BETWEEN THE EQUIPMENT LEVEL AND THE RECEIVER LEVEL.

THE “ADD RECEIVER” BUTTON ABOVE THE FREQUENCY INFORMATION ENTRY TABLE ENABLES THE USER TO ATTACH ADDITIONAL RECEIVERS TO THE CONCERNED TRANSMITTING FREQUENCY

- **MODIFY:** THIS ITEM MODIFIES THE CONTENT OF THE FREQUENCY INFORMATION TABLE, IF HAS NOT BEEN INCLUDED PREVIOUSLY IN ANY GRANTED LICENSE
- **DELETE:** THIS ITEM DELETES THE FREQUENCY INFORMATION AND ALL OTHER ATTACHED INFORMATION IN THE LOWER LEVEL OF THE TREE VIEW, IF HAS NOT BEEN INCLUDED IN ANY GRANTED LICENSE
- **TX FILTER:** THIS ITEM DISPLAYS OR DEFINES A TRANSMITTING EMISSION MASK FOR THE CONCERNED TRANSMITTING FREQUENCY
- **RX FILTER:** THIS ITEM DISPLAYS OR DEFINES A RECEIVING EMISSION MASK FOR THE CONCERNED RECEIVING FREQUENCY.
- **COORDINATION:** THIS ITEM DISPLAYS OR DEFINES THE LIST OF COUNTRY/ADMINISTRATION CODES WHICH ARE UNDER PROCESS OF COORDINATION, TOGETHER WITH THE RESULTS OF THE COORDINATION.



DIALOGUE BOX FOR DEFINITION OF TRANSMITTING FREQUENCY EMISSION MASK



ANTENNA INFORMATION ENTRY TABLE

SMS4DC - [Administrative data]

SMS4DC

Administrative data

- Anonymous Stations
- Active Licenses
 - Owner: FM broadcasting
 - License: fm broadcasting
 - BC Station: Elbasira Radio
 - Equipment:
 - BC Station: Elgwat Elmoslaha Radio
 - Equipment:
 - BC Station: Elkoser
 - Equipment: elkoser
 - BC Station: Elrabia Radio
 - Equipment:
 - Frequency: 94. MHz
 - Antenna: DEFAULT
 - BC Station: Khartoum Radio
 - Equipment:
 - BC Station: Kother Radio
 - Equipment:
 - BC Station: Masa Radio
 - Equipment:
 - BC Station: Omdurman Radio
 - Equipment:
 - BC Station: Omdurman Radio
 - Equipment:
 - BC Station: Open University of Sud
 - Equipment:
 - Frequency: 89.5 MHz
 - Antenna: DEFAULT
 - BC Station: Quran
 - Equipment:
 - BC Station: Quran Radio
 - Equipment:
 - BC Station: rabia94 khartoum
 - Equipment: Rabia94 kharotm
 - BC Station: Sawa Radio
 - Equipment:
 - BC Station: Sudan Radio 88
 - Equipment:
 - BC Station: sudan tv fm
 - Equipment: sudan tv fm
 - BC Station: University of Khartoum
 - Equipment:

- Owner: zain
- License: 900

Antenna information

Modify | Cancel | Save | Update | Add | Delete

| | Value | Unit |
|----------------------------|--------------|--------|
| Installation | | |
| Azimuth of Max. Radiation | 0.0 | Degree |
| Elevation | 0.0 | Degree |
| Antenna Height AGL | 0.0 | m |
| Technical | | |
| Antenna Name | DEFAULT | |
| Class of Antenna | C | |
| Antenna Type | | |
| Polarization | V | |
| Antenna Gain | 0.0 | dBi |
| Antenna Gain Type | I | |
| Antenna Directivity | N | |
| Hor. Beam Width | 360.0 | Degree |
| Ver. Beam Width | 360.0 | Degree |
| Reference Antenna | | |
| Maximum Effective Height | 0 | m |
| Frequency Range (from) | 20.000000 | MHz |
| Frequency Range (to) | 20000.000000 | MHz |
| Cross-Polar Discrimination | 0.0 | dB |
| Insertion Loss | -3.0 | dB |

Ready

Lat(N) : 19° 55' 30.000" Lon(E) : 031° 33' 0.000" Alt(m) : 329

16:35:45

start | ERO Document... | NTC E-mail - M... | 2 Microsoft... | LI Adobe Rec... | sessions | DB | Microsoft Pow... | SMS4DC SMS4DC - [Ad... | untitled - Paint | EN | 04/35/p



LEVEL OF ANTENNA

THE LEVEL OF ANTENNA IS PLACED BELOW THE LEVEL OF EQUIPMENT AND FREQUENCY

THE “LIBRARY” PUSH BUTTON ABOVE THE ANTENNA INFORMATION ENTRY TABLE ENABLES USER TO USE THE LIBRARY TO ATTACH AN ANTENNA TO THE CORRESPONDING EQUIPMENT THERE ARE NO LOWER LEVELS

- **MODIFY:** THIS ITEM MODIFIES THE CONTENT OF THE ANTENNA INFORMATION TABLE IF HAS NOT BEEN INCLUDED PREVIOUSLY IN ANY GRANTED LICENSE
- **DELETE:** THIS ITEM DELETES THE ANTENNA INFORMATION, IF HAS NOT BEEN INCLUDED IN ANY GRANTED LICENSE
- **ANTENNA PATTERN:** THIS ITEM DISPLAYS ANTENNA 2D RADIATION PATTERNS IN VERTICAL AND HORIZONTAL PLANES FOR HORIZONTALLY OR VERTICALLY POLARIZED ANTENNAS AND TWO HORIZONTAL PLANES FOR MIXED-POLARIZED ANTENNAS.



THE 2D RADIATION PATTERN OF A DIRECTIONAL ANTENNA

