

FREQUENTIS

FOR A SAFER WORLD

ATM Networks

MEVA TMG32 - Cuba

2017

Agenda Item 3.1

MEVA Network Operation and Performance: 05/2016-05/2017

Network Transmission:

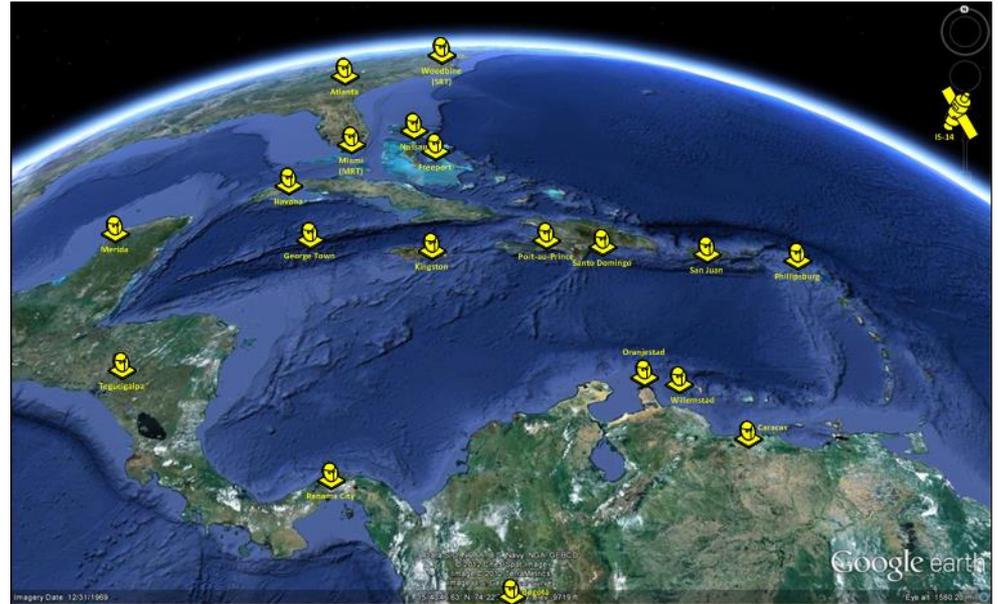
- IP-/ Data Circuits (Radar, AMHS/AFTN)
- Voice Circuits (ATS, PAMA, DAMA)

Network Topology:

- Meshed / Fully Meshed (MF-TDMA)

Network Availability:

- 99,90%



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MEVA Network Operation and Performance: 05/2016-05/2017

Network Capabilities:

- PAMA Voice
 - VSD: **56 interfaces**
 - ARD: **10 interfaces**
- DAMA Voice
 - SWV: **105 interfaces**
- AMHS IP (serial): **20 interfaces**
- AFTN (serial): **33 interfaces**
 - 4 sync / async circuits (PAD)
- Radar / AIDC / Remote Radio Link (serial): **14 circuits**

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MEVA Network Operation and Performance: 05/2016-05/2017

Scope of Services:

■ SLA

- Fault Reporting: 24/7 (Hotline)
- Fault Processing: 24/7 (Partner, FRQ)
- Service Time (on-site): 24/7 (Partner)
- NOC max. response time: 45 minutes (Hotline, FRQ)
- Max. restoration time for on-site services (excluding response, travel time and spare part delivery time): 8 hrs (Partner)
- MTTR: 2 hrs
- Pro-active monitoring (FRQ)

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MEVA Network Operation and Performance: 05/2016-05/2017

On-going Duties:

- Monthly Reporting > On-going
- Yearly local preventive maintenance > On-going, started in March 2017
- 2nd level support (24/7 1st level by Speedcast) > On-going
- On-site maintenance > Case-by-Case
- Spare part stocking > On-going
- Yearly participation TMG meetings abroad > On-going

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MEVA Network Operation and Performance: 05/2016-05/2017

Operational Issues:

- Freeport
 - Antenna & BUC destroyed
 - Both replaced by new ones
- E/CAR
 - Failure isolation on ARD lines complicated
 - Interaction between parties
- Space-Segment issues
 - No interference measured at period

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MEVA Network Operation and Performance: 05/2016-05/2017

Operational Issues (cont.):

- T1's in Miami turns out to be terminated in a single DSU
 - Problems to move into different configuration with provider
 - Still under investigation
- Hotline
 - Rare usage of Ticket System
 - Better caller identification > solved?

Agenda Item 3.1

MEVA Network Operation and Performance: 05/2016-05/2017

Organizational Issues:

- Frequentis
 - Contract movement from COMSOFT to Frequentis completed
 - Some unpaid invoices (overdue since months)
- NEWCOM bought by Speedcast
 - No differences in service delivery measured.

Agenda Item 3.2

Results of MEVA III 2017 Annual Maintenance visits

The following items are applicable to all sites. Items for individual sites are presented on subsequent slides.

- Annual maintenance program: Dates of performance are listed per country.
- Protocols are available at MEVA webpage.
- Status Definition:
 - Red – High priority
 - Orange – Medium Priority
 - Green – No action required

Agenda Item 3.2

Results of MEVA III 2017 Annual Maintenance visits

Site	Circuit Status (i.e.: FXS, E&M, AFTN)	Protocol	On-the-Job Training	Comment	Date on Site
Aruba Dual Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Replaced antenna feed-window Status Green	April 10 th 2017 Status Green.
Cuba Single Chain Configuration	All circuits operational. Status Green	Scheduled for May 9 th 2017 Status Orange	Scheduled for May 9 th 2017 Status Orange	BUC and spares available on site Status Green	Plan: May 8 th 2017 Status Orange
Atlanta Dual Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Installed 2 nd AC power line between UPS and ODU. Redundancy switch over tested. Status Green	April 18 th 2017 Status Green.

Agenda Item 3.2

Results of MEVA III 2017 Annual Maintenance visits

Site	Circuit Status (i.e.: FXS, E&M, AFTN)	Protocol	On-the-Job Training	Comment	Date on Site
Miami Dual Chain Configuration	All circuits operational. Status Green	Status Green	N/A	AM done at Teleport Status Green 2 nd UPS installed Status Green	Februar 2 nd 2017 Status Green
Dominican Republic Dual Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	No comments Status Green	Status Green.
Haiti Dual Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Replaced defective WG switch (RX) and 1 LNB due to water leak Status Green	April 26 th 2017 Status Green.

Agenda Item 3.2

Results of MEVA III 2016 Annual Maintenance visits

Site	Circuit Status (i.e.: FXS, E&M, AFTN)	Protocol	On-the-Job Training	Comment	Date on Site
Jamaica Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Replaced antenna feed window Status Green	April 24 th 2017 Status Green.
Grand Cayman Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Replaced antenna feed window Status Green	April 2 nd 2017 Status Green.
COCESNA (Honduras) Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	No comments Status Green	April 4 th 2017 Status Green.

Agenda Item 3.2

Results of MEVA III 2017 Annual Maintenance visits

Site	Circuit Status (i.e.: FXS, E&M, AFTN)	Protocol	On-the-Job Training	Comment	Date on Site
Bahamas- Freeport Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Installed new antenna Status Green After 3 days of operation BUC starts to inherit. 2 nd visit for BUC swap planned for May 4 th Status Red	March 25 th 2017 Status Green.
Bahamas- Nassau Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Spare FAD 8400 lost (maybe during hurricane 2016) Status Green	April 26 th 2017 Status Green.
Mexico- Merida Single Chain Configuration	All circuits operational. Status Green	Schedule open Status Red	OJT provided to customer Status Green	Station installed October 31 st 2016. Status Green	Schedule open Status Red

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Results of MEVA III 2017 Annual Maintenance visits

Site	Circuit Status (i.e.: FXS, E&M, AFTN)	Protocol	On-the-Job Training	Comment	Date on Site
Curacao Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	FAD 8400 missing on spare stock – ready for repair awaiting cust. response Status Orange	April 11 th 2017 Status Green.
Panama Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Antenna reflector shows wholes – reason most probably ext influence.. Status Orange	April 6 th 2017 Status Green.
Puerto Rico Dual Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	Installed 2 nd UPS Only one AC cable available between IDU & ODU Status Green	April 24 th 2017 Status Green.

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Results of MEVA III 2017 Annual Maintenance visits

Site	Circuit Status (i.e.: FXS, E&M, AFTN)	Protocol	On-the-Job Training	Comment	Date on Site
Venezuela Indoor Unit only	All circuits operational. Status Green	Schedule open Status Red	Schedule open Status Red	Because of political situation postponed Status Red	Schedule open Status Red
Colombia Indoor Unit only	All circuits operational. Status Green	Signed Status Green	N/A	No comment Status Green	April 7 th 2017 Status Green.
St. Maarten Single Chain Configuration	All circuits operational. Status Green	Signed Status Green	N/A	No comment Status Green	April 12 th 2017 Status Green.

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Results of MEVA III 2017 Annual Maintenance visits

Annual Maintenance:

- All protocols are available for review at MEVA Webpage
 - Documents/Annual Maintenance/2017/Protocol
- Caracas postponed due to actual political situation
- Cuba to be done upfront TMG/32

Agenda Item 3.3

Improvements to MEVA III node performance

Improvements:

- Late 2016 / Early 2017 sun-outage
 - Whole outages within expected period
- PAD Colombia
 - Lima (online)
 - Manaus still not operational (link is ready to use...)

Agenda Item 3.3

Improvements to MEVA III node performance

Improvements (cont.):

- Monthly Report
 - ERLANG B calculation
 - two calculation methods introduced “closed system” vs “open system”
 - 5% blocking rate on „open system“ calculation method overstepped several times
 - continued at Agenda item #3.4

Agenda Item 3.3

Improvements to MEVA III node performance

Improvements reached :

- Mexico now part of MEVA III
- New UPS installations at San Juan and Atlanta
- New AMHS services established
- New VSD line Cuba/Miami established
- Redundancy behaviour on FADs improved
 - failure detection adapted to avoid unwanted switch-over

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Improvements to MEVA III node performance

Improvements reached (cont.):

- Successfull VLAN tagging test for circuit REDDIG (Panama/Colombia)
 - VLAN can be used to provide additional IP circuits
 - Usage of available FAD Ethernet port

- Introduction of AFTN/AMHS decommissioning agreement

Agenda Item 3.3

Improvements to MEVA III node performance

Improvements to be reached in near future:

- Q & A
 - FRQ to clarify questions on
 - Unpaid invoices
 - AIREON services (ADS-B) through MEVA III network
 -



Agenda Item 3.4

MEVA III Monitoring and Reporting

ERLANG B modelling:

- The Erlang B traffic model is used by telephone system designers to estimate the number of lines required for PSTN connections (CO trunks) or private wire connections.
- The three variables involved are Busy Hour Traffic (BHT), Blocking and Lines:
 - Busy Hour Traffic (in Erlangs) is the number of hours of call traffic there are during the busiest hour of operation of a telephone system.
 - Blocking is the failure of calls due to an insufficient number of lines being available.
 - E.g. 0.03 mean 3 calls blocked per 100 calls attempted.
 - Lines is the number of lines in a trunk group.

Agenda Item 3.4

MEVA III Monitoring and Reporting

ERLANG B modelling (cont.):

- The Erlang B formula assumes an infinite population of sources (such as telephone subscribers), which jointly offer traffic to N servers (such as telephone lines).
 - At closed systems (known amount of population of sources) the ERLANG B rate is half

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MEVA III Monitoring and Reporting

SWV:

- November 2016: 39.067 calls
- December 2016: 28.374 calls
- January 2017: 40.064 calls
 - January 2016: 26.971 calls
 - February 2017: 39.733 calls
 - February 2016: 38.090 calls
 - March 2017: 41.785 calls
 - March 2016: 36.938 calls

	Bandwidth available	peak day	busy hour	calls	av call dur	Erlang	bloc
november	18	19	5	168	77,14	3,6	8,9
december	8	9	9	146	55,12	2,24	1,9
january	15	22	8	169	74,1	3,48	8,1
february	16	19	5	143	76,1	3,02	5,3

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MEVA III Monitoring and Reporting

ERLANG B:

Calculations on ERLANG B blocking

Most busy day: 3 March 2016
Most busy hour: 6:00 PM
Calls during busy hour: 152
Av. call dur. (busy hour): 66,72 seconds

Calculation: duration x calls / 3600 seconds

SWV BW reserved for 6 lines Changed from 5 lines to 6 due to higher volume (1 Oct. 2015)

Blocking
max

5 %

Open System
PABX

Closed System
SkyWAN

USED ERLANG

2,82 ERLANG

> Blocking better then:

4,30%

2,15%

Max Available ERLANG

2,95 ERLANG

> Blocking contracted:

5,00%

Calculation failure !!!



Agenda Item 3.4

MEVA III Monitoring and Reporting

ERLANG B:

Calculations on ERLANG B blocking

Most busy day: 18 March 2017
Most busy hour: 5:00 PM
Calls during busy hour: 165
Av. call dur. (busy hour): 84,32 Seconds

Calculation: duration x calls / 3600 seconds

SWV BW reserved for 6 lines Changed from 5 lines to 6 due to higher volume (1.Oct. 2015)
Blocking max 5%

USED ERLANG (Open System)	<u>3,86 ERLANG</u>	>	Blocking better then:	10,70%
ERLANG (Closed System)	<u>1,93 ERLANG</u>	>	Blocking better then:	1,00%
Max Available ERLANG	<u>2,95 ERLANG</u>	>	Blocking contracted:	5,00%

Calculation failure corrected !!!



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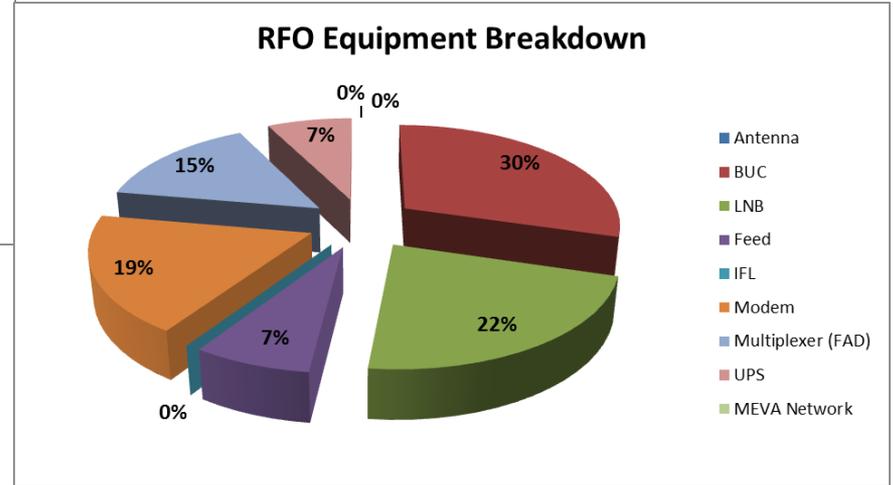
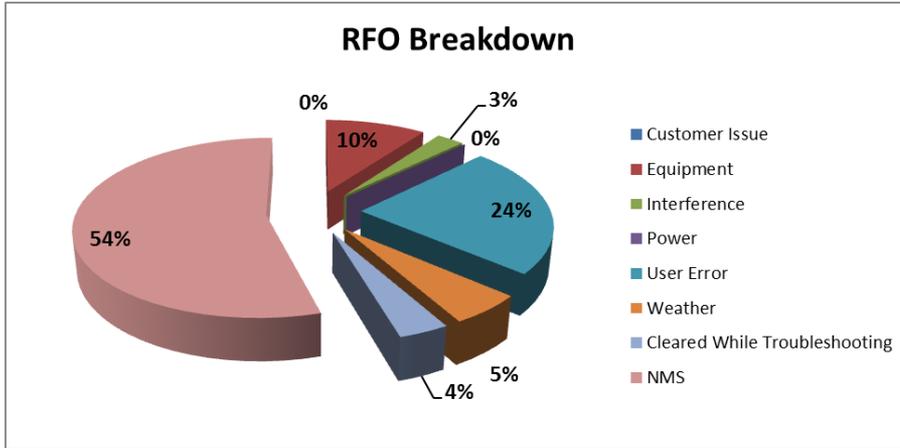
MEVA III Monitoring and Reporting

RFO Breakdown:

RFO	#	Equipment	#
Customer Issue	11	Antenna	0
Equipment	3	BUC	8
Interference	0	LNB	6
Power	26	Feed	2
User Error	6	IFL	0
Weather	4	Modem	5
Cleared While Troubleshooting	60	Multiplexer (FAD)	4
NMS	0	UPS	2
		MEVA Network	0

Agenda Item 3.4

MEVA III Monitoring and Reporting



Agenda Item 3.4

MEVA III Monitoring and Reporting

Webpage structure:

- Documents

Index of /SecuredArea/Ablage/Folders/Documents/

Name	Last Modified	Size	Type
Parent Directory/		-	Directory
Annual Maintenance/	2016-May-12 23:26:21	-	Directory
BUC replacement report/	2015-Sep-07 08:51:05	-	Directory
CDRL/	2015-Sep-28 09:36:28	-	Directory
Circuit ID/	2015-May-28 20:33:48	-	Directory
Graphs/	2016-Jan-03 17:44:54	-	Directory
Helpdesk Test Procedure/	2015-Sep-07 08:58:33	-	Directory
MEVA POC/	2015-Jun-02 08:36:25	-	Directory
Manuals/	2015-May-05 09:32:38	-	Directory
Monthly Reports/	2016-May-12 17:23:05	-	Directory
SDD/	2016-Apr-02 10:44:42	-	Directory
SNMP Access Local/	2015-May-29 14:15:28	-	Directory
Station Documentation/	2015-Apr-22 16:14:12	-	Directory
Sun Outage Prediction/	2014-Dec-11 21:14:45	-	Directory