

Safety Review Issue Meeting

13 October 2023
Nairobi

ARMA

Africa Indian Ocean
Regional Monitoring Agency



RVSM Report

In order to accomplish the ICAO Annex 6 part 1 height monitoring requirements, the ARMA continued to coordinate with all ARMA Member States to publish their minimum monitoring requirements through the MMR system and published in the ARMA website to ensure the availability of these requirements all the time for

the concerned AFI Civil Aviation Authorities and the airline operators. All airline operators of RVSM approved aircraft are required to participate in the RVSM height monitoring program. The principal purposes of the long-term height monitoring program are the verification of long-term ASE stability and the efficacy of an operator's continued airworthiness program.

ARMA manages 2 E2GMU in the AFI Region, one unit based in South Africa and the other in Kenya. These units help operators to meet height keeping requirements in compliance of ICAO Annex 6 Part I.

Please take note of the current height monitoring status in the graphs below:



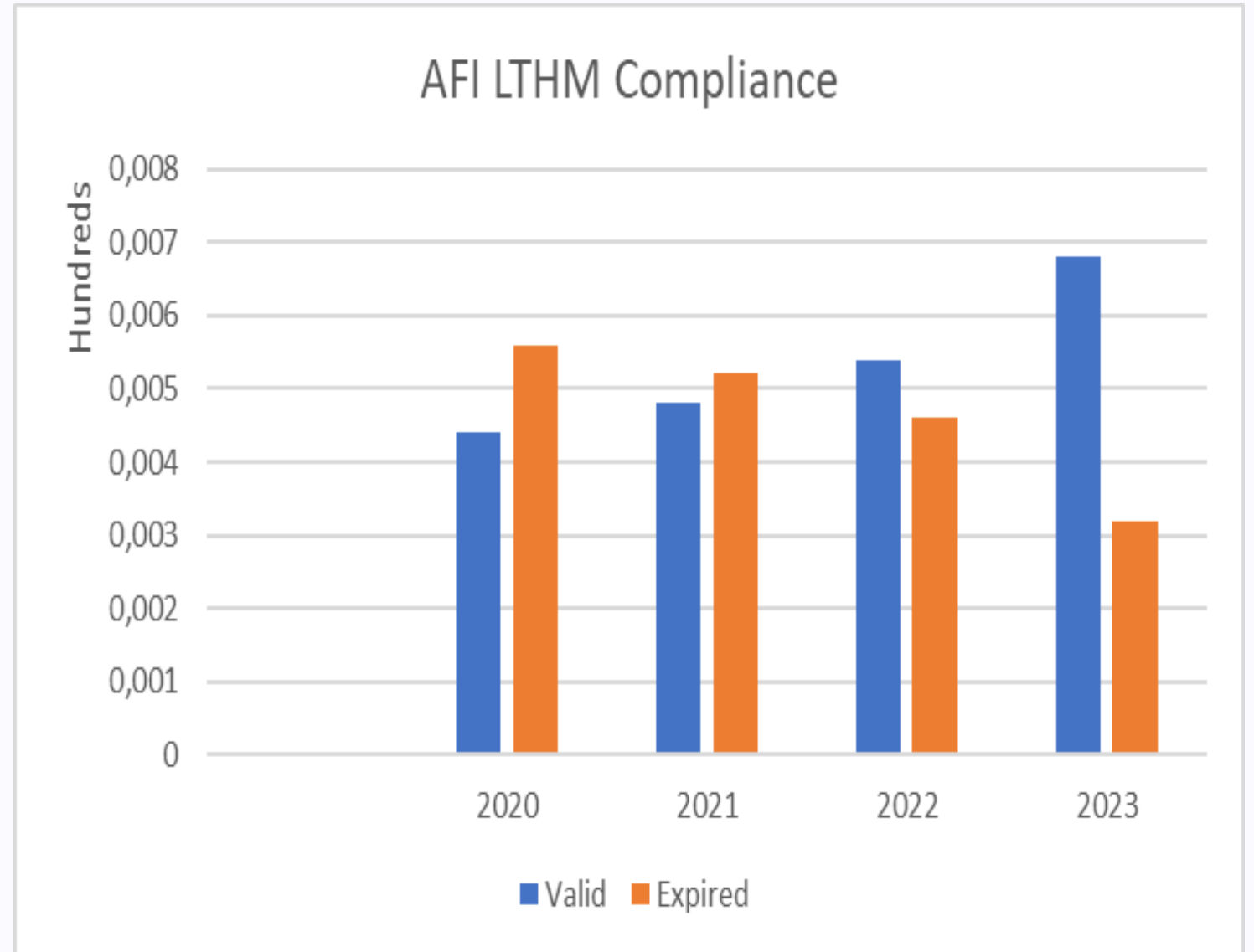
Eastern Focus RVSM/PBCS for countries

ICAO DOC 9930(AFI RAN)
ICAO DOC 7030
ICAO DOC 9937
ICAO DOC 9574
ICAO DOC 9869(PBCS)
ICAO ANNEX 6
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RVSM Report

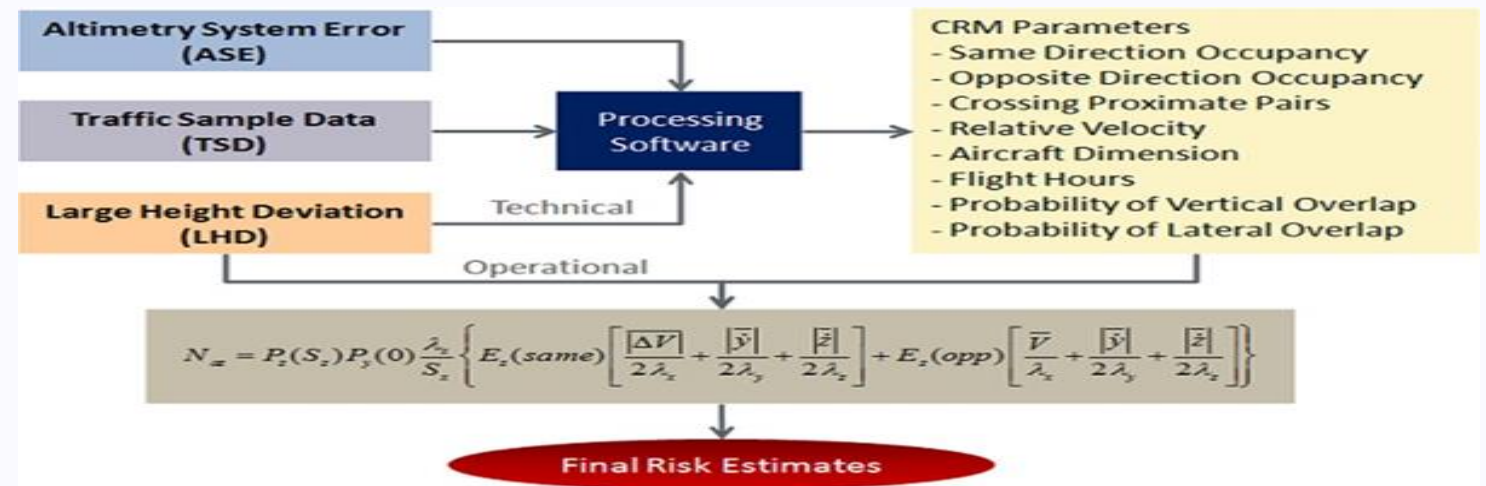


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RVSM Report

The RMA conducts operational environment collision risk estimates using data provided by accredited member States. An event is reportable to the RMA when either an aircraft makes a deviation from a cleared level between FL 280 and FL 420 (cleared or actual) or an ATC clearance results in a risk bearing situation, such as loss of separation or TCAS initiated deviation. The important parameters which must be available if the report is to be used for the quantifiable risk assessment include the magnitude of deviation and duration, which is not made available in many cases. As much information as possible should be provided on the report to assist in the estimation of the required parameters and nature of the event



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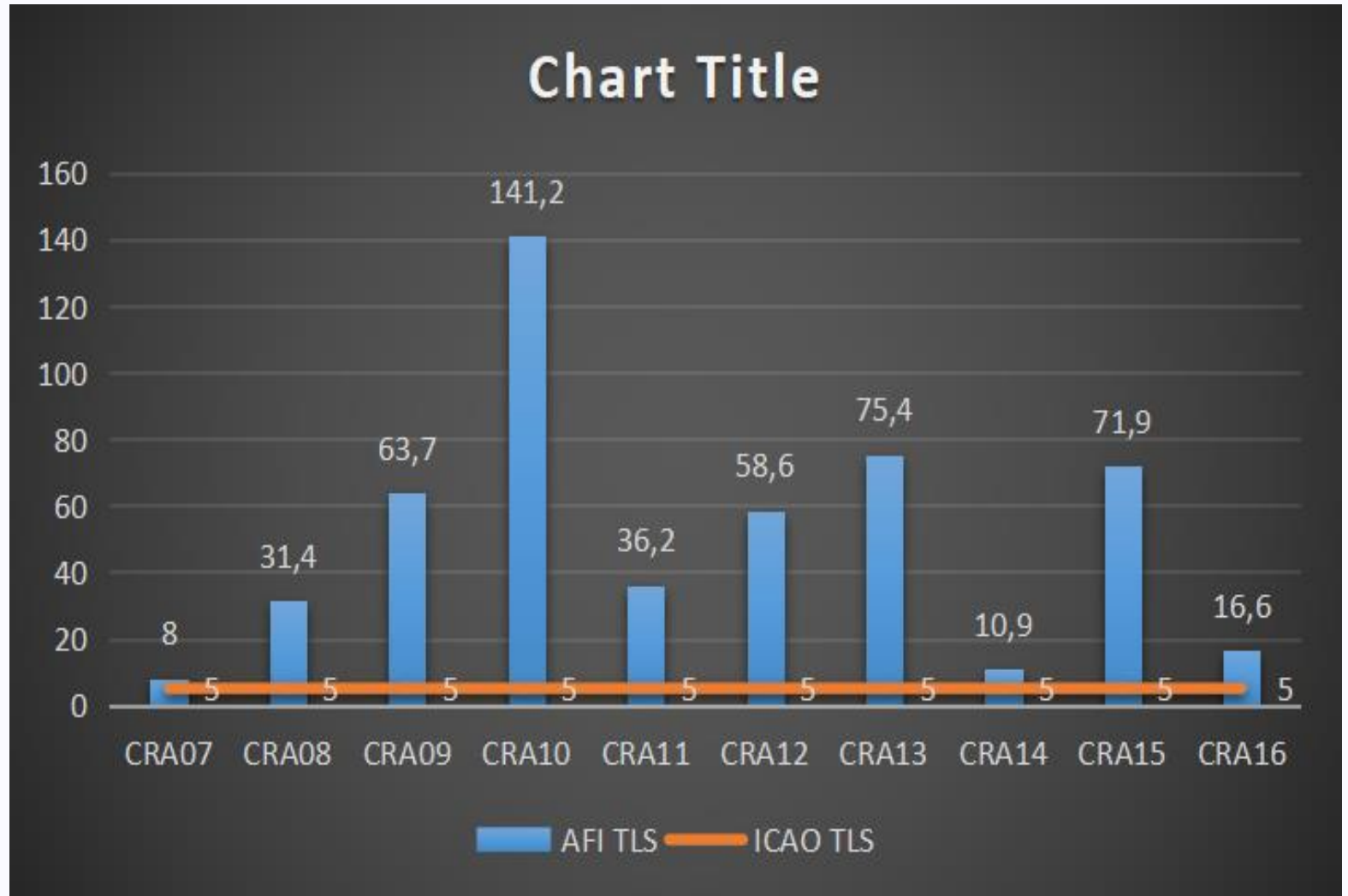
RVSM Report

FIR	NPM Responds	TSD 2023 Jan- Sep	SLOP Implementation
Addis Ababa	Nardos	0	No
Asmara	No Focal Point	0	No
Dar Es Salaam	Mapinduzi	0	No
Entebbe	Adam	8	Yes
Kigali	Parfait	9	No proof provided
Nairobi	Collins	6	No
Mogadishu	Ahmed	8	Yes
Brazzaville	Billy/Mbuyi	6	Yes

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Target Level of
Safety:AFI

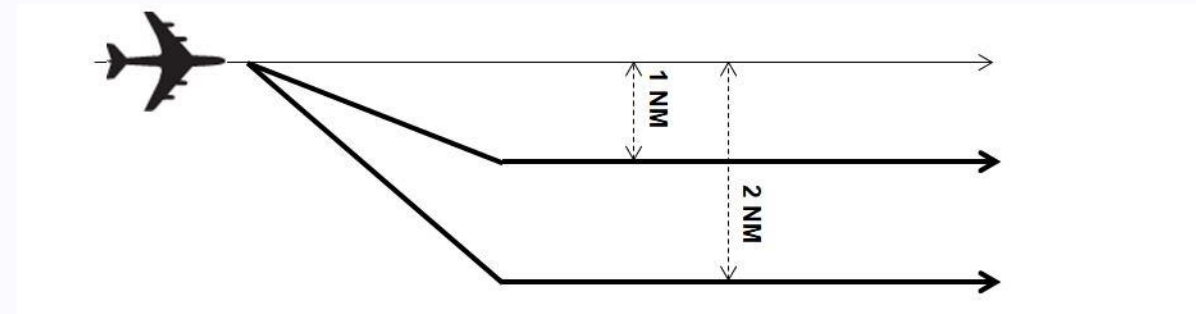


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Strategic Lateral Offset Procedure(SLOP)

SLOP is no longer limited by ICAO to oceanic and remote continental airspace outside ATS surveillance coverage and there should be no basis for IFATCA opposing a properly-implemented SLOP regime in regular continental airspace with ATS surveillance in accordance with ICAO provisions. ICAO provisions for SLOP have evolved over time: originally SLOP was limited to aircraft in oceanic non-surveillance airspace, but it may now be implemented in all en route airspace. When SLOP is implemented, the magnitude of the offset is determined by the route spacing and separation minima that applies in the airspace. With the advent of global navigation satellite systems (GNSS) and advanced flight management systems, the accuracy with which aircraft are navigated along their intended route has improved significantly. Today aircraft navigating using GNSS are often no further than their wingspan away from the published route centreline; therefore, aircraft that are operating along the same route are much more likely to laterally overlap one another. In the case of an operational error or blunder (such as an aircraft operating at a level not expected by the controller) aircraft on the same route could collide, with potentially catastrophic consequences.





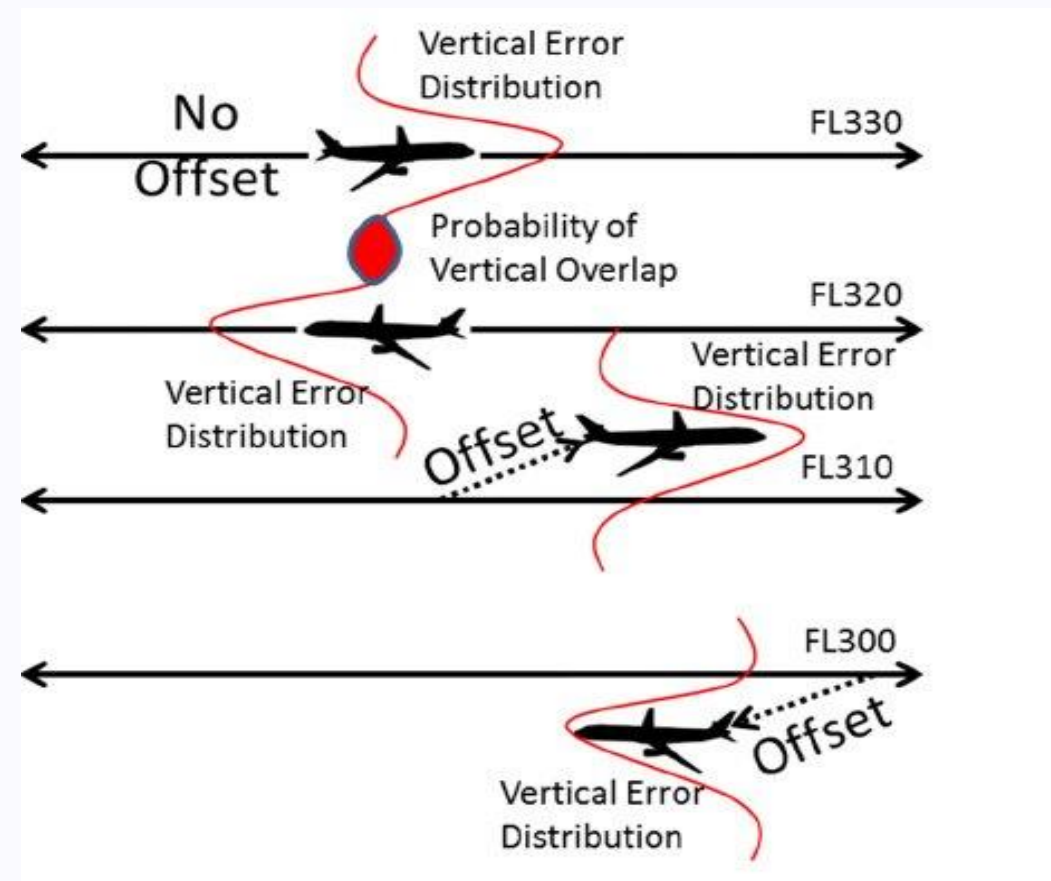
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Altimetry System Error and Offset(SLOP)

Altimetry System Error (ASE) is an often unknown aircraft characteristic which can have a significant and detrimental impact on aircraft separation, but which occurs unnoticed by pilots, controllers and ACAS.

ASE can only be monitored in an operational environment by dedicated height monitoring, utilising specialised systems and techniques. It is important that both State authorities and aircraft operators (civil and military), understand the implications of ASE and know how to respond when receiving reports of aircraft with poor ASE characteristics from the Regional Monitoring Agencies who are tasked with monitoring responsibilities.

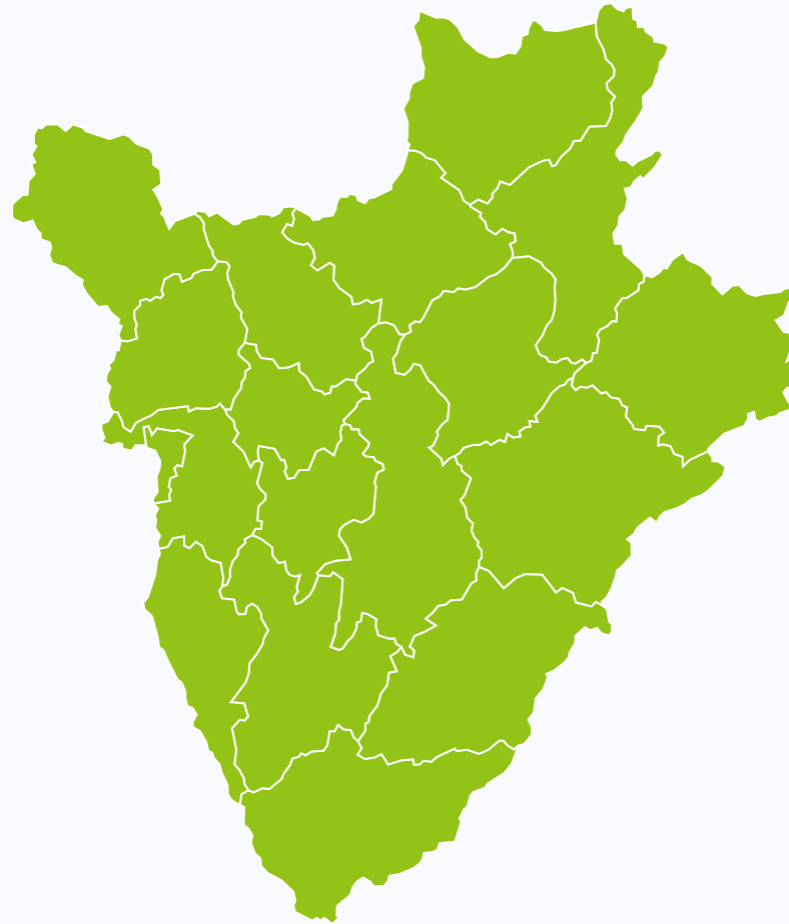




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Burundi(Bujumbura)



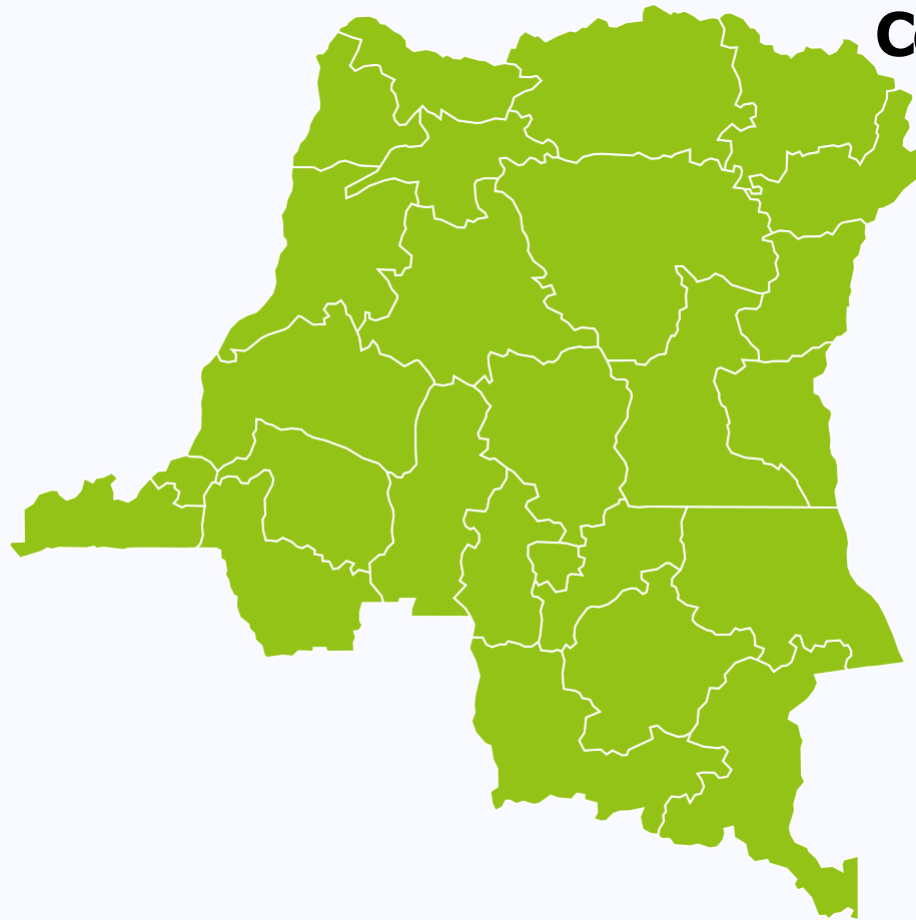
LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
NONE	NO	NONE	NO REGISTRATIONS	9UGHNE145	NONE



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CAO DOC 9930(AFIRAN)
ICAO DOC 7030
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ICAO DOC 9574
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Democratic Republic of Congo(Kinshasa)



LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
NO REPORTS	YES	0%	22	NONE	NONE

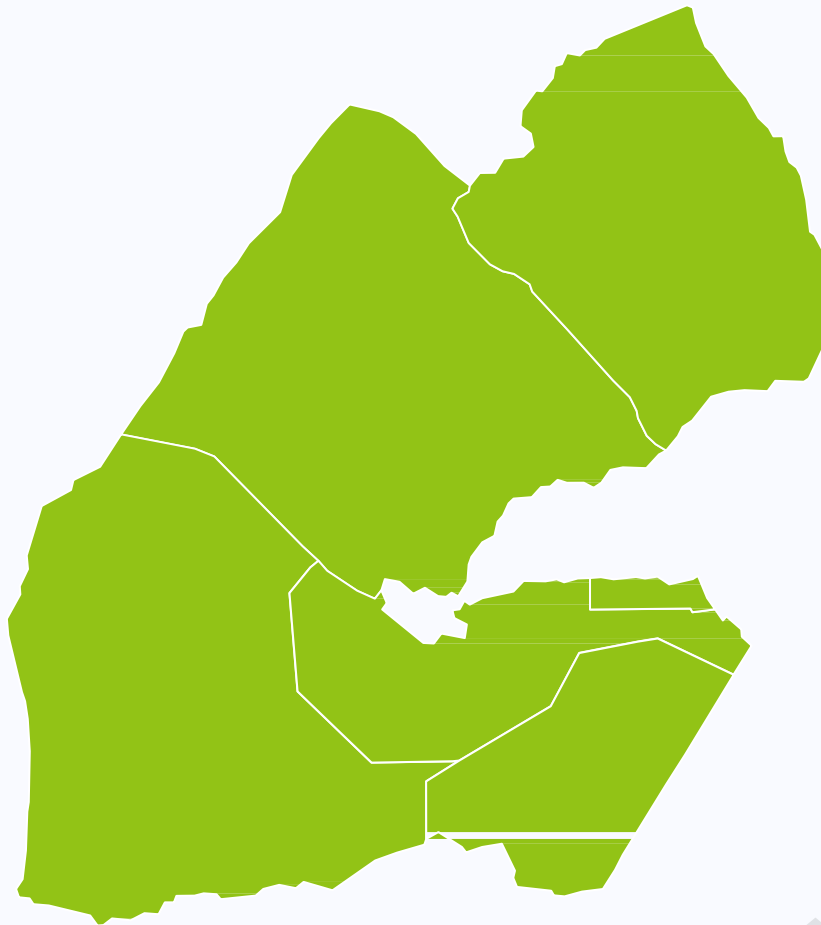


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Djibouti(Addis Ababa)



LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
23	NO	0%	0	NONE	NONE

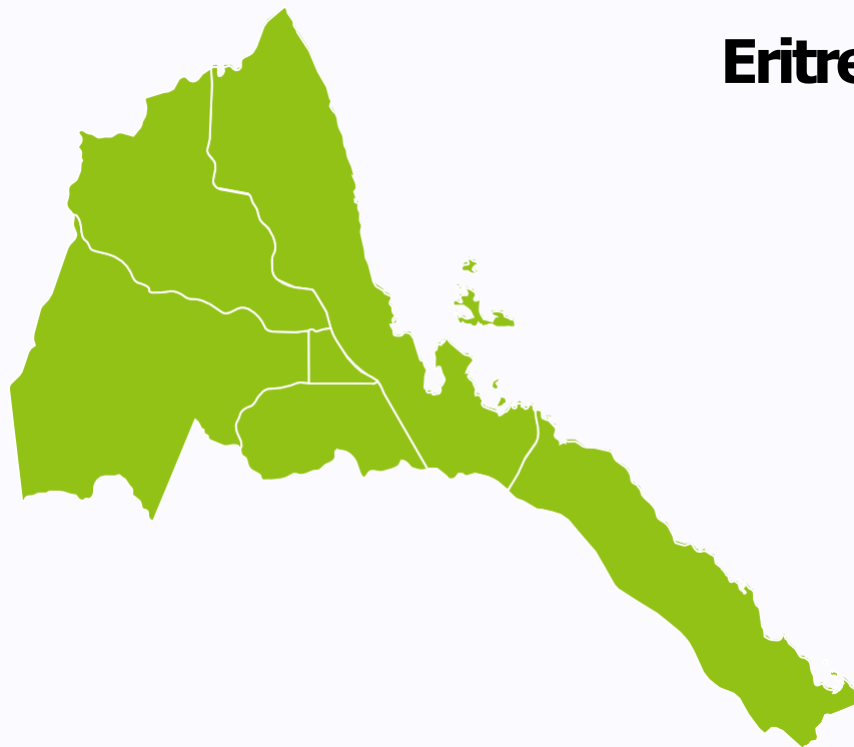


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Eritrea(Asmara)



LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
30	NO	NONE	0	0	0

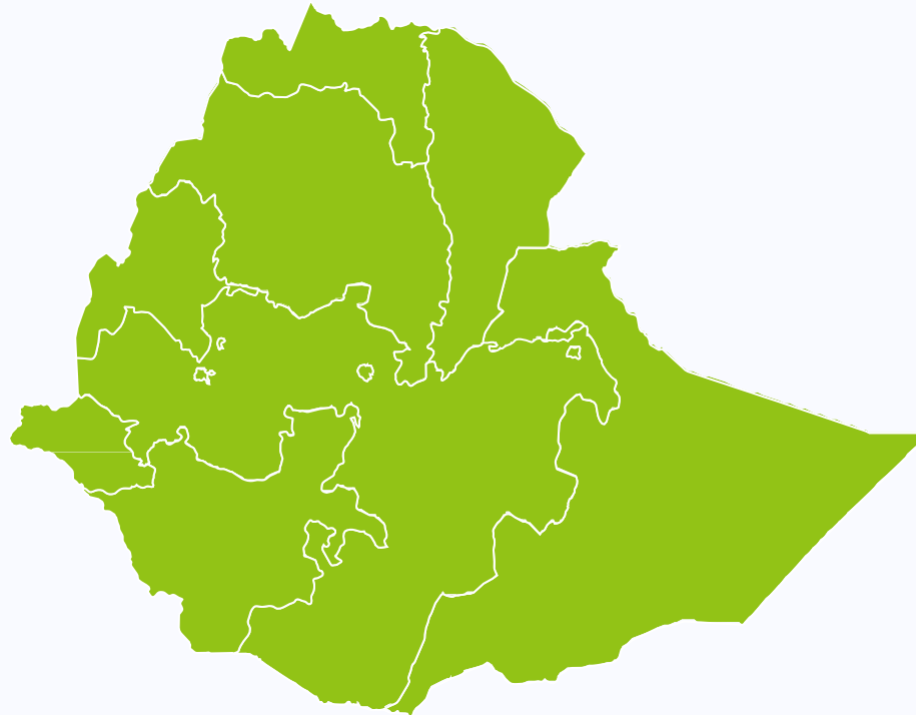


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Ethiopia(Addis Ababa)



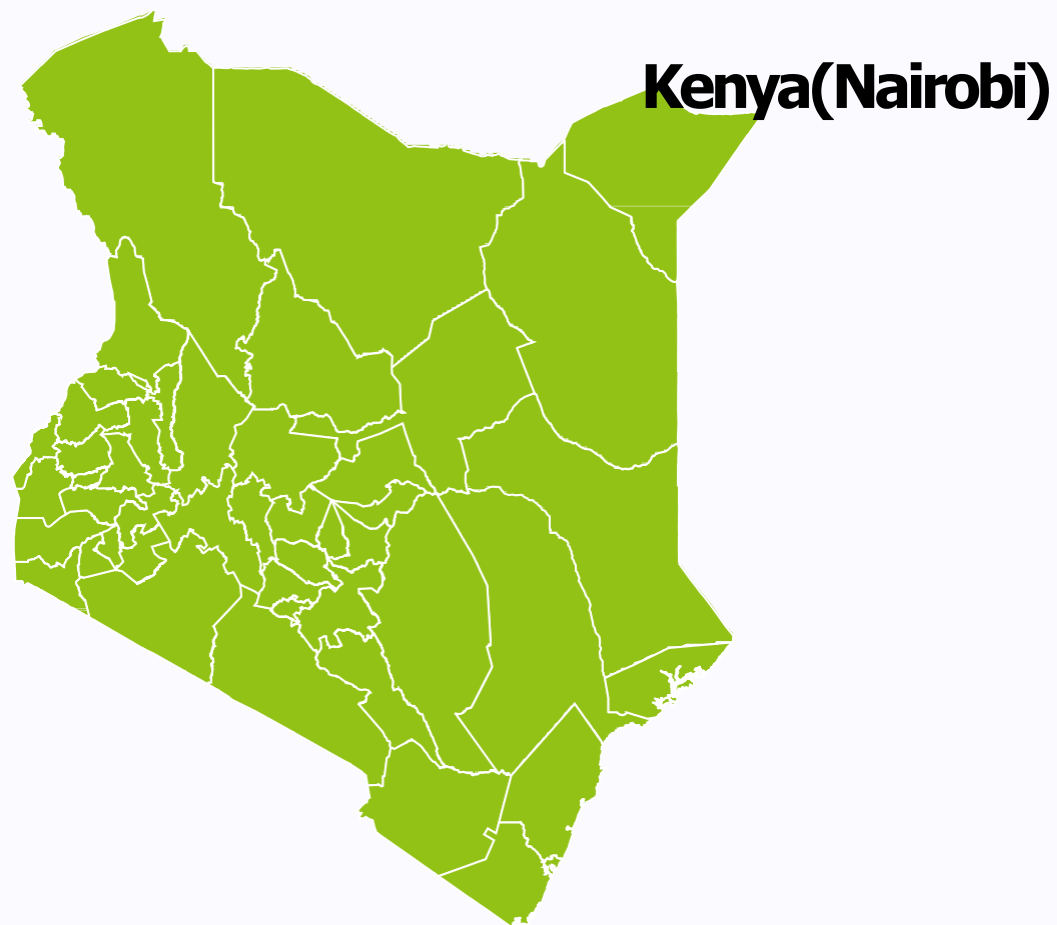
LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
0	NO	58%	119	2	2



Eastern Focus RVSM/PBCS for countries

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LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
NO REPORTS	NO	49%	90	5YSKE 5YSKX 5YJWF 5YBVY	NONE

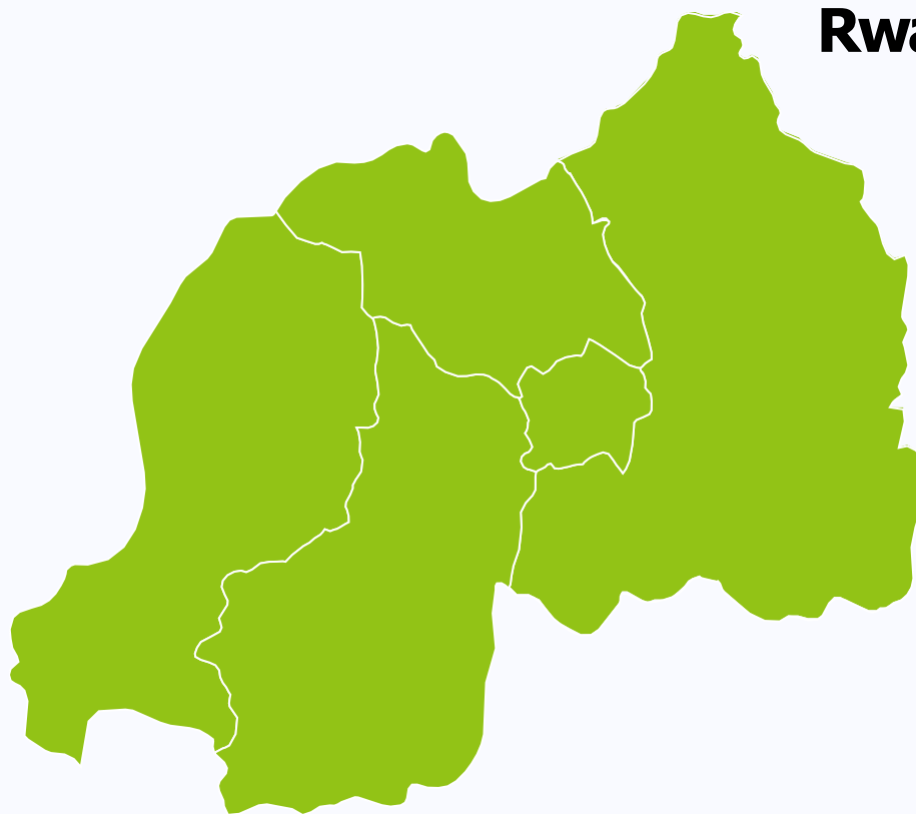


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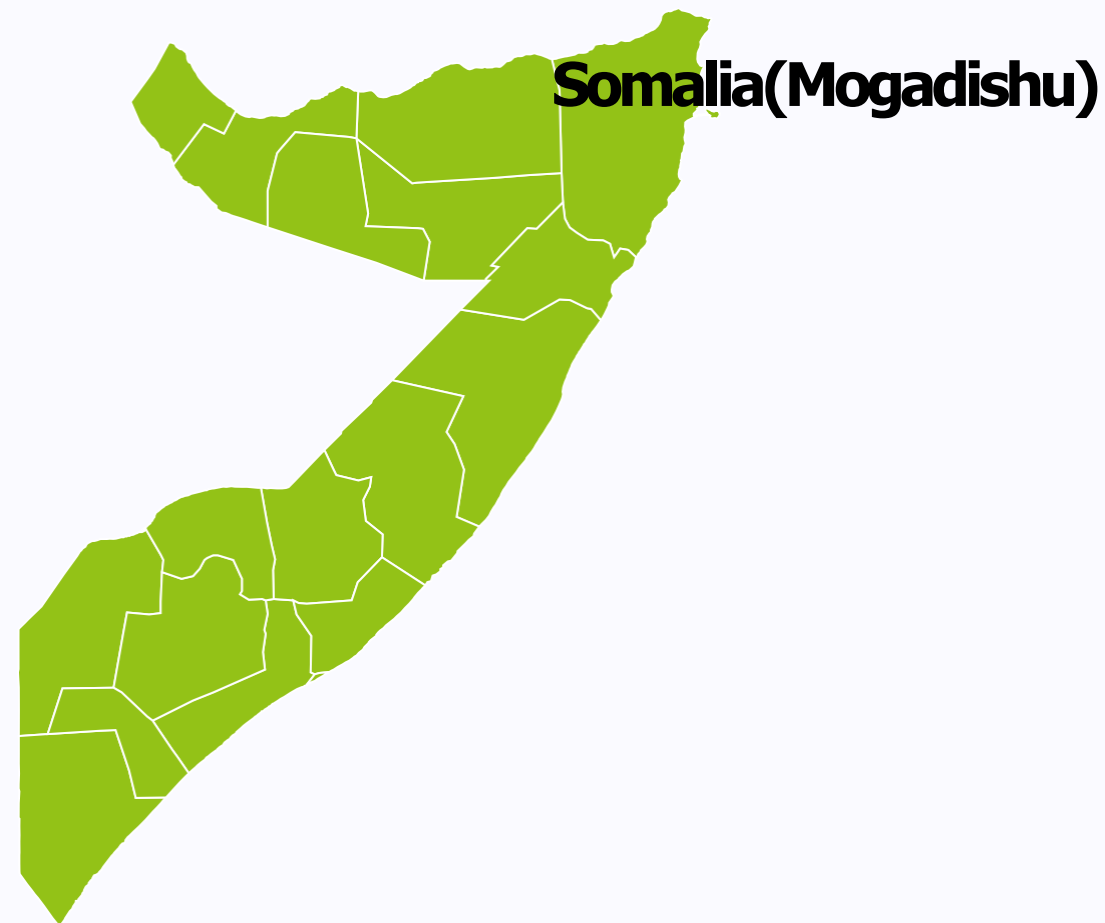
Rwanda(Kigali)



LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
NO REPORTS	NO PROOF	100%	11	NONE	NONE



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LHD

8

SLOP

YES

**HEIGHT
MONITORING**

0%

**RVSM
APPROVALS**

No Registrations

**NON-
APPROVALS**

NONE

**PBCS
APPROVALS**

NONE

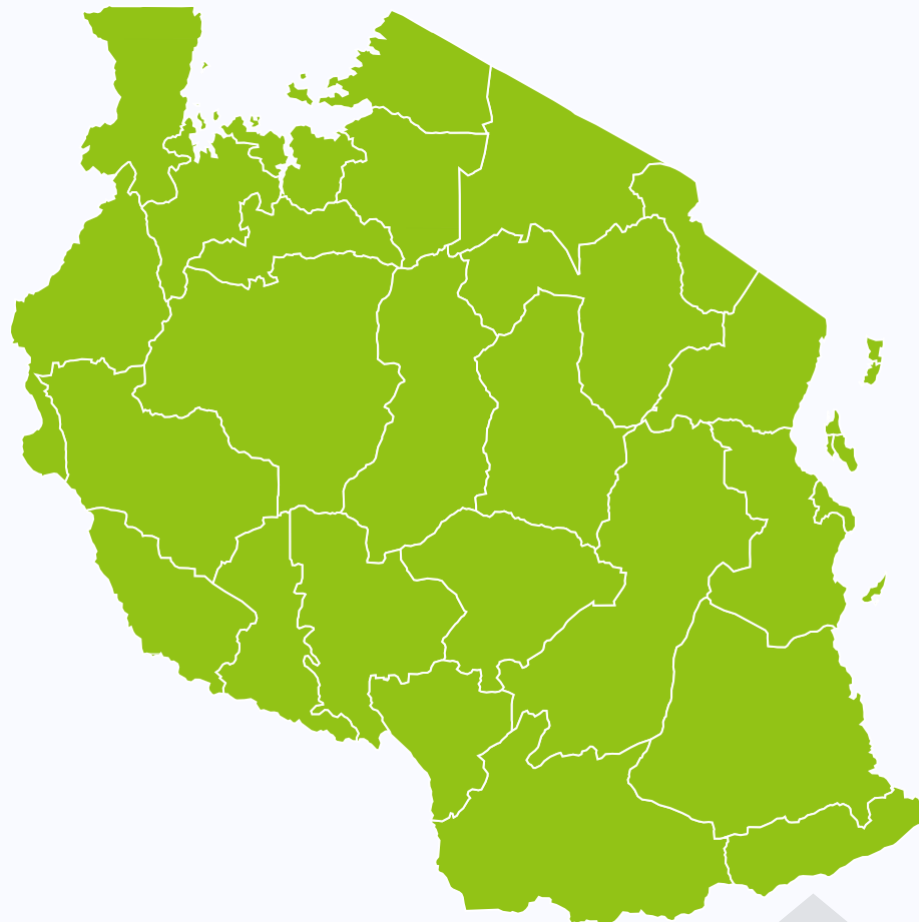


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Tanzania(Dar es Salaam)



LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
0	No	20%	5	NONE	NONE



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Malawi(Lilongwe)



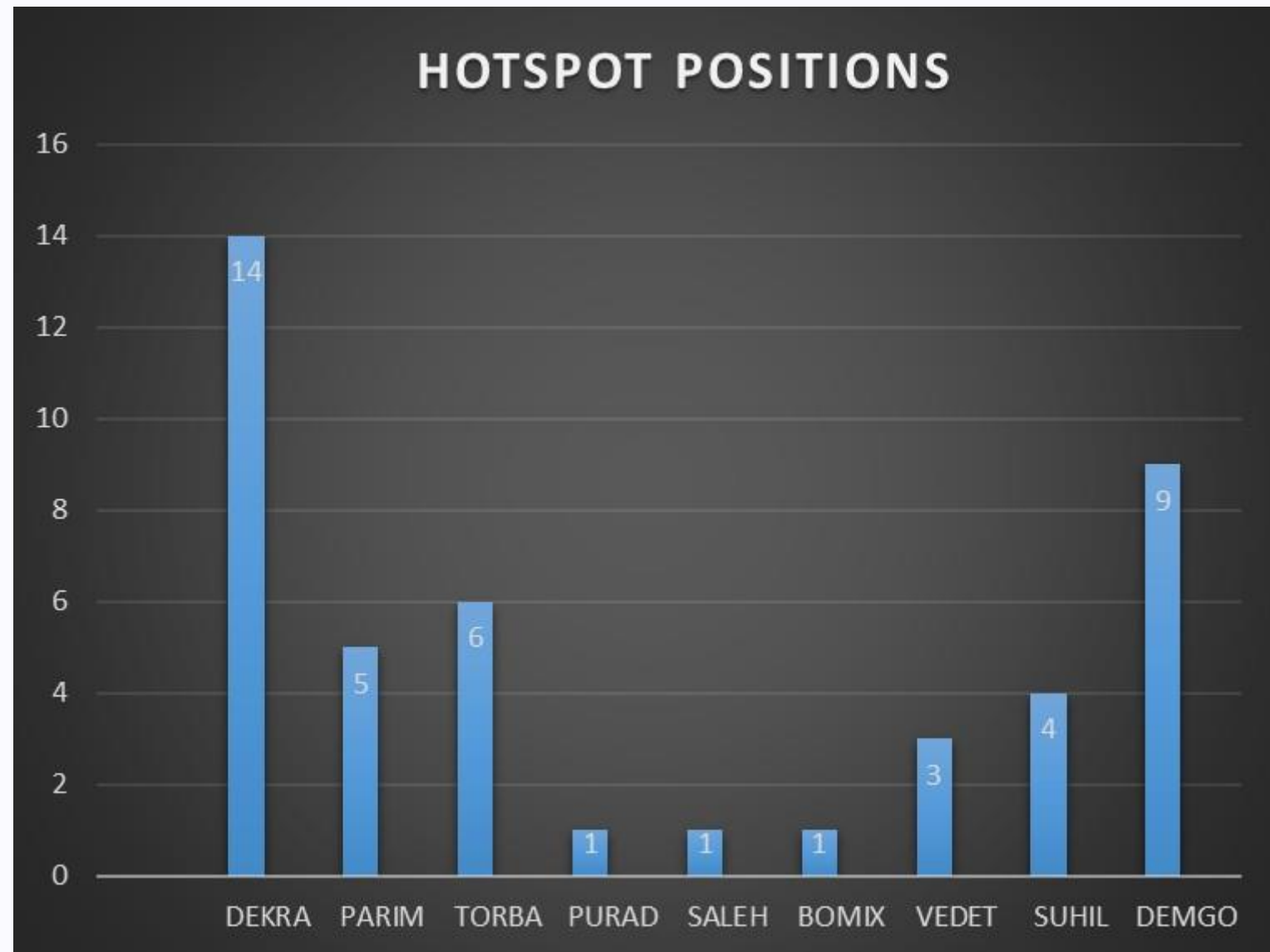
LHD	SLOP	HEIGHT MONITORING	RVSM APPROVALS	NON-APPROVALS	PBCS APPROVALS
0	Yes	0%	1	NONE	NONE



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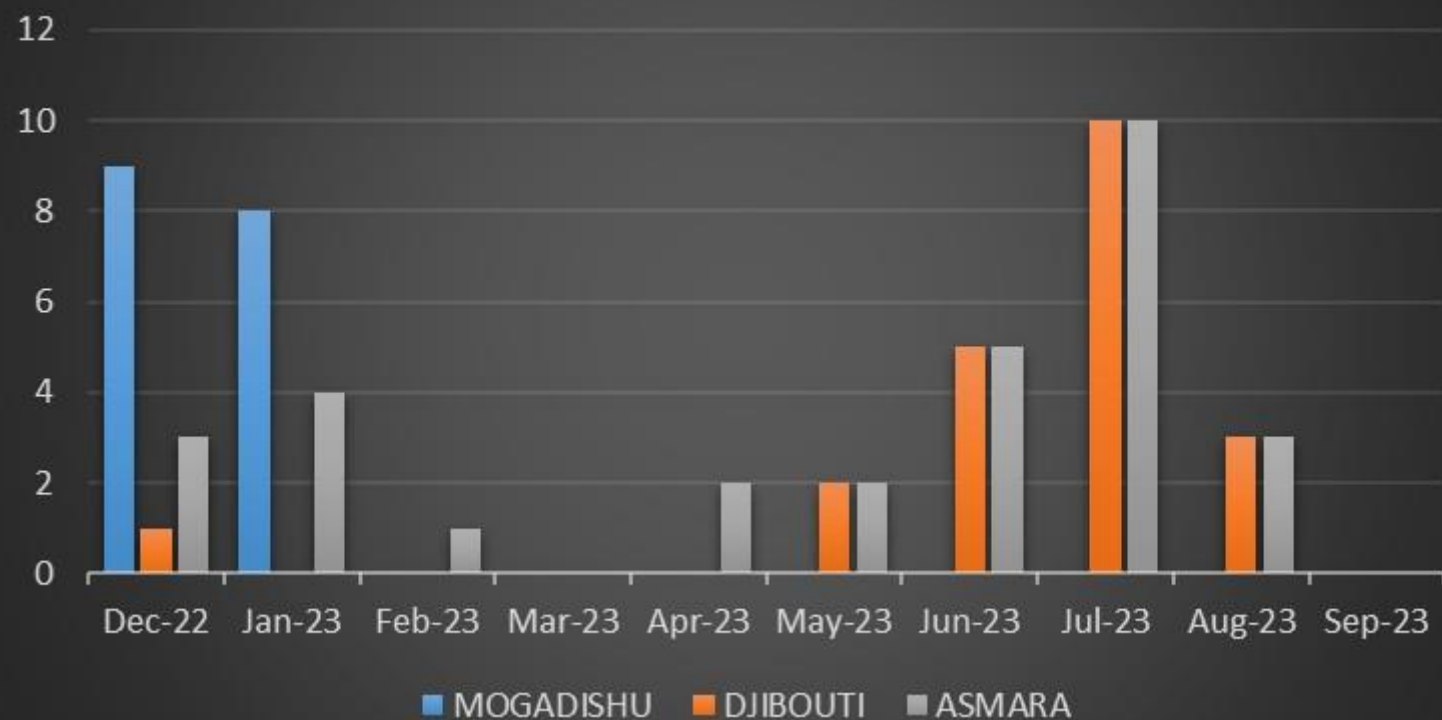


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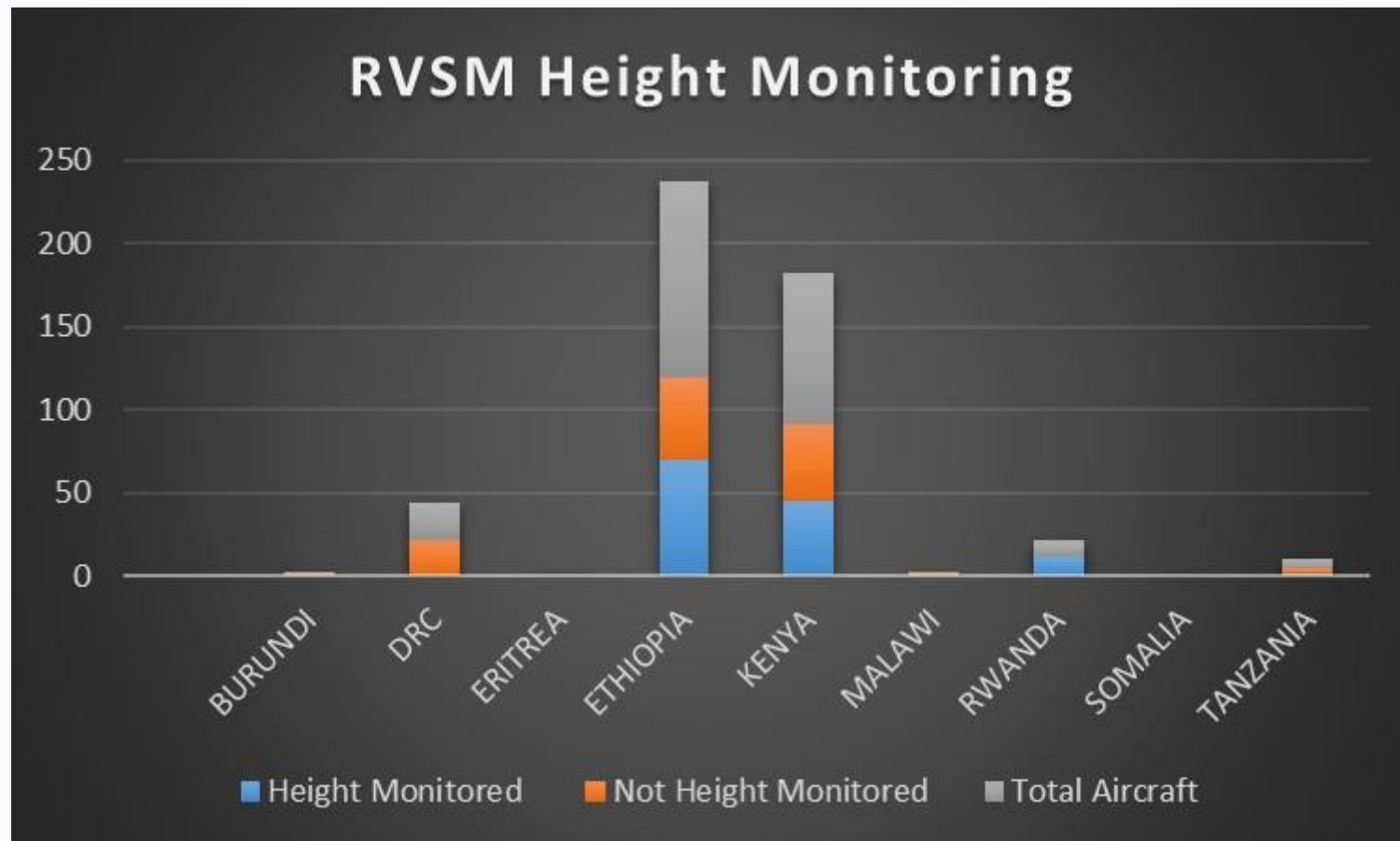
LHD Mogadishu/Djibouti/Asmara



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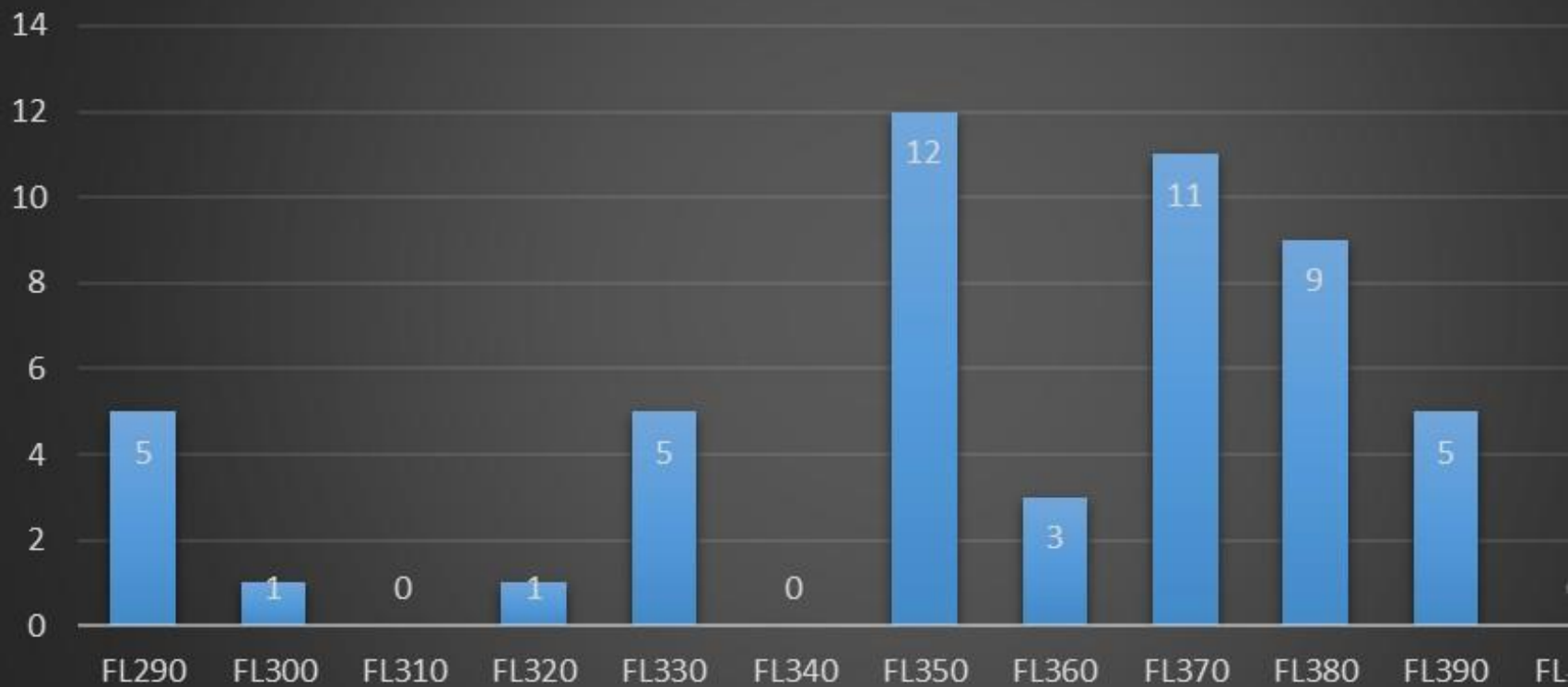


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LHD FL HOTSPOT





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Why is it important to report LHDs?

- RMAs use LHD data to estimate airspace risk. The most important parameter is LHD duration. Roughly speaking, the longer the duration, the higher the risk.
- The resulting risk estimates act as a trigger for States to initiate collaboration to solve safety issues, especially when the risk exceeds the Target Level of Safety (TLS) of 5.0×10^{-9} Fatal Accidents per Flight Hour (FAPFH).
- RMAs provide annual reports to the Regional Airspace Safety Group (RASG), which reports to APIRG. States can also use information provided in the report to help identify their safety issues

UNDERSTANDING WHAT AN LHD

- A LHD happens when an aircraft occupies space unexpected by a controller. Not knowing that the space is occupied, the controller may clear another aircraft to that location, which may cause a mid-air collision.
- An LHD contributes to the risk regardless of whether a loss of separation occurred or not.
- ATC authority is responsible for reporting LHD to the responsible RMA

Just like Annex 14 established Standards and Recommended Practices (SARPS) for the CATS and CARS, it must be understood Annex 6 and 11, ICAO Doc 9937 and Doc 9574 are just as important and serious as the SARPS highlighted in the CATS and CARS. As Part 12 covers Mandatory Reporting of Occurrences.



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LHD CATEGORIES SUB SECTIONS

- A - F LHD OPERATIONAL EVENTS
- G - H LHD AIRCRAFT CONTINGENCY EVENTS
- I LHD DEVIATION DUE TO METEOROLOGICAL CONDITIONS
- J - K LHD DEVIATION DUE TO TCAS ADVISORIES
- L-M LHD OTHER



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LHD TAXINOMY

LHD Category Code	LHD Category Description
A	Flight crew failing to climb/descend the aircraft as cleared
B	Flight crew climbing/descending without ATC Clearance
C	Incorrect flight level provided due to incorrect operation or interpretation of airborne equipment (e.g. incorrect operation of fully functional FMS, incorrect transcription of ATC clearance or re-clearance in FMS, flight plan followed rather than ATC clearance, original clearance followed instead of re-clearance etc.)
D	ATC system loop error (e.g. ATC issues incorrect flight level clearance or flight crew misunderstands flight level clearance message.)
E	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of human factors issues (e.g. late or non-existent coordination of flight level)
F	Coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues (e.g. late or non-existent coordination of flight level)
G	Aircraft contingency event leading to sudden inability to maintain assigned flight level (e.g. pressurization failure, engine failure)
H	Airborne equipment failure leading to unintentional or undetected change of flight level (e.g. altimetry errors)
I	Turbulence or other weather related causes leading to unintentional or undetected change of flight level
J	TCAS resolution advisory, flight crew correctly climb or descend following the resolution advisory
K	TCAS resolution advisory, flight crew incorrectly climb or descend following the resolution advisory
L	An aircraft being provided with RVSM separation is not RVSM approved (e.g. flight plan indicating RVSM approval but aircraft not approved, ATC misinterpretation of flight plan)
M	Others



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