



RASG-AFI Controlled Flight Into Terrain (CFIT) Workshop.

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**Kebba Lamin Jammeh
Regional Officer, Flight Safety
ICAO Regional Office, Dakar.**





Status of implementation of the Safety Enhancement Initiatives (SEIs) identified to mitigate CFIT-related Occurrences in the RASG-AFI Region – Overview.

- CFIT Definition.
- Status of Implementation of the Safety Enhancement Initiatives (GPWS; SOPs; CDFA; FDAP; CRM; ALAR; MSAW; PBN) identified to mitigate CFIT-related occurrences in the RASG-AFI Region.
- References.
- Conclusion & Take-Away.



CFIT Definition.

What is Controlled Flight Into Terrain (CFIT) ?

A situation where a properly functioning aircraft under the control of a fully qualified and certificated crew is flown into terrain with no apparent awareness on the part of the crew.



RASG-AFI Accidents by Risk Category

Although Zero CFIT-related accident has been reported for the last 8 years for the RASG-AFI Region, CFIT continues to be a High Risk Category of occurrence thus, no room for complacency.



Status of Implementation of the Safety Enhancement Initiatives (GPWS; SOPs; CDFA; FDAP; CRM; ALAR; MSAW; PBN) identified to mitigate CFIT-related occurrences in the RASG-AFI Region.

The CFIT- related Protocol Questions (PQs) from the ICAO USOAP CMA Online Framework have been used as a tool to assess the level of implementation of the SEIs in the RASG-AFI Region. States that have satisfactorily implemented these SEIs have been identified to facilitate provision of support to other States.



1. Safety Enhancement Initiative CFIT 1 (SEI-1): Ground Proximity Warning Systems (GPWS) With Forward Looking Terrain Avoidance Function.

This safety enhancement substantially reduces or eliminates CFIT accidents by improving pilot situational awareness through the installation and use of Ground Proximity Warning Systems (GPWS) with a forward-looking feature (also known as TAWS or EGPWS).



SEI-1: GPWS

PQ 4.153

Does the flight operations inspection organization ensure that the air operator includes, in its operations manual:

- a) Instructions and training requirements on the avoidance of CFIT, and*
- b) Policy on the use of GPWS?*



2. Safety Enhancement Initiative CFIT 2 (SEI-2): Standard Operating Procedures (SOPs).

All air operators should have Standard Operating Procedures (SOPs) and training which should address all projected normal situations which crew and company personnel will encounter. SOPs address: use of checklists, what each person's responsibilities are, use of available equipment, and expected procedures to be used during preflight, taxi, take-off, climb, cruise, descent, approach, missed approach, landing, taxi and parking.



SEI-2: SOPs

PQ 4.149

Does the flight operations inspection organization ensure that the air operator outlines, in its operations manual, standard operating procedures (SOPs):

- 1) For each phase of flight,*
- 2) Crew briefings for departure and approach,*
- 3) Developed checklists as an integral part of its SOPs, and*
- 4) Instructed and/or trained its flight and cabin crew on how to use the SOPs?*

57.1% Implementation rate by the RASG-AFI States.



4. Safety Enhancement Initiative CFIT 4 (SEI-4): Flight Data Analysis (FDAP).

A Flight Data Analysis Programme (FDAP) is a predictive and non-punitive use of information derived from aircraft flight data recorders to improve aviation safety. The use of FDA as an important safety tool has grown as emerging technology expands the capabilities of gathering and analyzing such data. Daily collection and analysis of data provides valuable information to correct undesirable trends, improve safety and ultimately reduce the number of accidents.



SEI-4: FDAP

PQ 4.203

Does the flight operations inspection organization ensure that:

a) the air operator has established and maintained a flight data analysis programme,

b) the flight data analysis programme is non-punitive and contains safeguards to protect the source(s) of the data?

35.1% Implementation rate by the RASG-AFI States.



7. Safety Enhancement Initiative CFIT 7 (SEI-7): Minimum Safe Altitude Warning (MSAW).

Recognizing that installation of radars and associated MSAW capability provides the necessary levels of terrain avoidance protection to aircraft operations, States are to consider this aspect when determining the justification for installation of new radar equipment. Justification would be strengthened for installation of radar where the CFIT risk is high.



SEI-7: MSAW

PQ 4.151

Does the flight operations inspection organization ensure that the air operator outlines, in its operations manual, instructions on the clarification and acceptance of air traffic control (ATC) clearances, particularly where terrain clearance is involved?

66.7% Implementation rate by the RASG-AFI States.



8. Safety Enhancement Initiative CFIT 8 (SEI-8): Performance-Based Navigation (PBN) Procedures.

PBN is an international harmonization of navigation requirements and specifications based on the **accuracy/ integrity** of the aircraft position. It is based on two main sets of specifications:

- **RNAV = aRea NAVigation:** Capability to fly any desired flight path – especially on longrange flights – defined by waypoints such as geographic fixes (LAT/LONG) and not necessarily by ground nav aids.
- **RNP = Required Navigation Performance,** which is GNSS based.



SEI-8: PBN

PQ 4.171

Does the flight operations inspection organization ensure that an air operator has established a route guide to be used by its flight crew for each flight?

64.3% Implementation rate by the RASG-AFI States.



SEI-8: PBN

PQ 4.301

Does the flight operations inspection organization approve the method for determining aerodrome operating minima for aeroplane operators?

70.0% Implementation rate by the RASG-AFI States.



Recommendation:

All RASG-AFI States should implement PBN procedures for all instrument runways by end of 2025.



The RASG-AFI States that have satisfactorily implemented all the identified CFIT-related PQs

Burkina Faso

Congo (the)

Côte d'Ivoire

Democratic Republic of the Congo (the)

Equatorial Guinea

Gabon

Mauritius

Mozambique

Rwanda



Summary of SEIs and their levels of Implementation

SEI	% Implementation Rate
SEI-1: GPWS	77.4%
SEI-2: SOPs	57.1%
SEI-4: FDAP	35.1%
SEI-7: MSAW	66.7%
SEI-8: PBN	64.3% Instrument Departures/Arrivals; 70.0% Aerodromes Operating Minima.



ICAO References

- STD A6, Part I, 3.3 & Att. H:
Flight Safety Documents System;
- STD A6, Part I, 3.3, 4.2.2 & App. 2, 2.1.30:
Policy for the use of the ground proximity
warning system (GPWS) ;
- STD A6, Part I, 3.3, 4.2.2 & App. 2, 2.1.34: Safety,
(SMS);
- STD A6, Part I, 3.2.3: FDAP;
- USOAP CMA Online Framework.





ICAO Refs.

- PANS-OPS Doc 8168, VOL I: SOPs





CONCLUSION:

The summary has indicated a low level of implementation of the SEIs identified. Only **9** RASG-AFI States have fully implemented all the identified CFIT-related SEIs (PQs), which is **18.75%**



Take Away!

Safety Enhancement Initiative (SEI): Mitigate contributing factors to CFIT accidents and incidents.

- States that have fully implemented all the identified CFIT-related SEIs (PQs) to support the other States.
- States that have not fully implemented all the identified CFIT-related SEIs (PQs) to seek support from the ones that have.



Take Away!

- RSOOs to collaborate with States that have fully implemented all the identified CFIT-related SEIs (PQs) in providing support to the other States.
- All States to Implement PBN procedures for all instrument runways by 2025.
- Develop and Implement further safety enhancements to mitigate the risk of the identified contributing factors, if any, to CFIT.
- Conduct continuous evaluation of the performance of the safety enhancements and share data on the outcomes.



Take Away!

The CFIT Workshop documentation is available at:

<https://www.icao.int/ESAF/Pages/CFIT-2022.aspx>

