Scope

1. Provision of Air Navigation Services
2. CNS/ATM infrastructure
3. Airspace structure
4. Traffic Growth and CNS/ATM projects
5. Safety Performance Monitoring & Management
6. Examples of SPIs - SPTs
7. National Aviation Safety Plan

National Air Navigation Services - NANSC

National Air Navigation Services Co.

- A non-share governmental owned company.
- Affiliated to the Egyptian Holding Company for Airports and Air Navigation. – Ministry of Civil Aviation
- The sole provider of air navigating services in Egypt.
- Iso 2009/2015 certified.
- ECAA certified.

Strategic Imperatives

Strategic Imparities

- **Provide efficient CNS/ATM associated services**
- **Deliver continuous improvement to our safety performance;**
- **Harmonization & Alignment with regional / global initiatives;**
- **Support aviation industry;**
- **Maintains environmental sustainability;**

Corporate Social Responsibility(CSR)

Corporate Social Responsibility is to integrates social and environmental principles into the company activities in terms of environmental and economical sustainability.
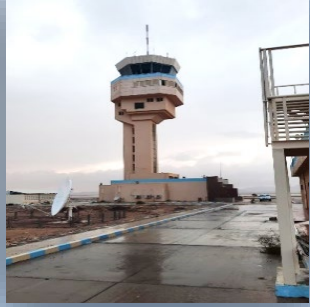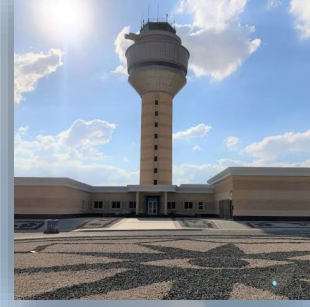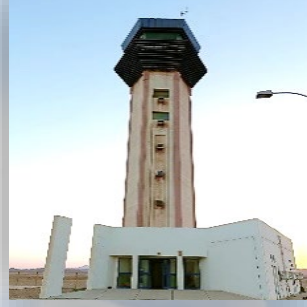
28 Air Traffic Control units (Aerodromes)

19 VOR Navigation Systems

22(3-d) + 6 PSR/SSR Surveillance Radar Sys

1 Air Traffic Management Systems (ACC)
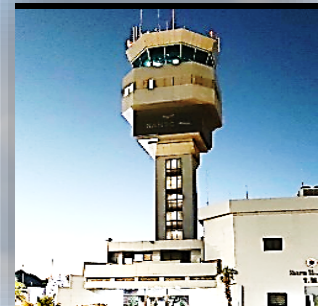
VHF Communication Systems

HF Communication System

1 Surface Movement Radar Systems

2 satellite and microwave networks

Mega Projects
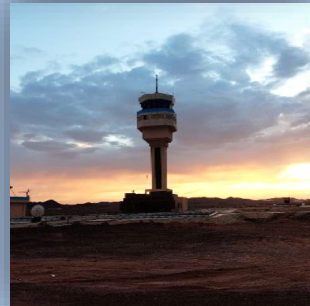
Accomplished Projects.

- Deployment of 22 (3-D) radar.

- Migrate from IAT to AMHS.

- Installation of ATM systems for 5 airports.

Future Projects.

- Installation New VHF – VCCS – VRS – Remote – etc.

- Establishment of the 3rd satellite network (22 satellite stations) .

- Replacement of CANC, Cairo Approach and TWR ATM systems.

- Installation of New AIS packages to migrate to AIM.

Airspace Layout:

- RNAV-5 Network routes of about *15000 NM*.

- 19 VORs/D-VORs for TMA's / En-route traffic.

- *Recently, airspace optimization has implemented in terms of ATS route network enhancements which resulted in reducing the overall flown distances and emissions as follows*

  - Predicted reduction in track miles 400.9 (NM)

  - Estimated Fuel Saving (Kg) 2173.8

  - Predicted reduction in CO_2 Emissions (Kg) 6869.356

- *Airspace restructure is considered in a way that will improve safety and efficiency as well as to enhance operational interphase with neighboring States.*
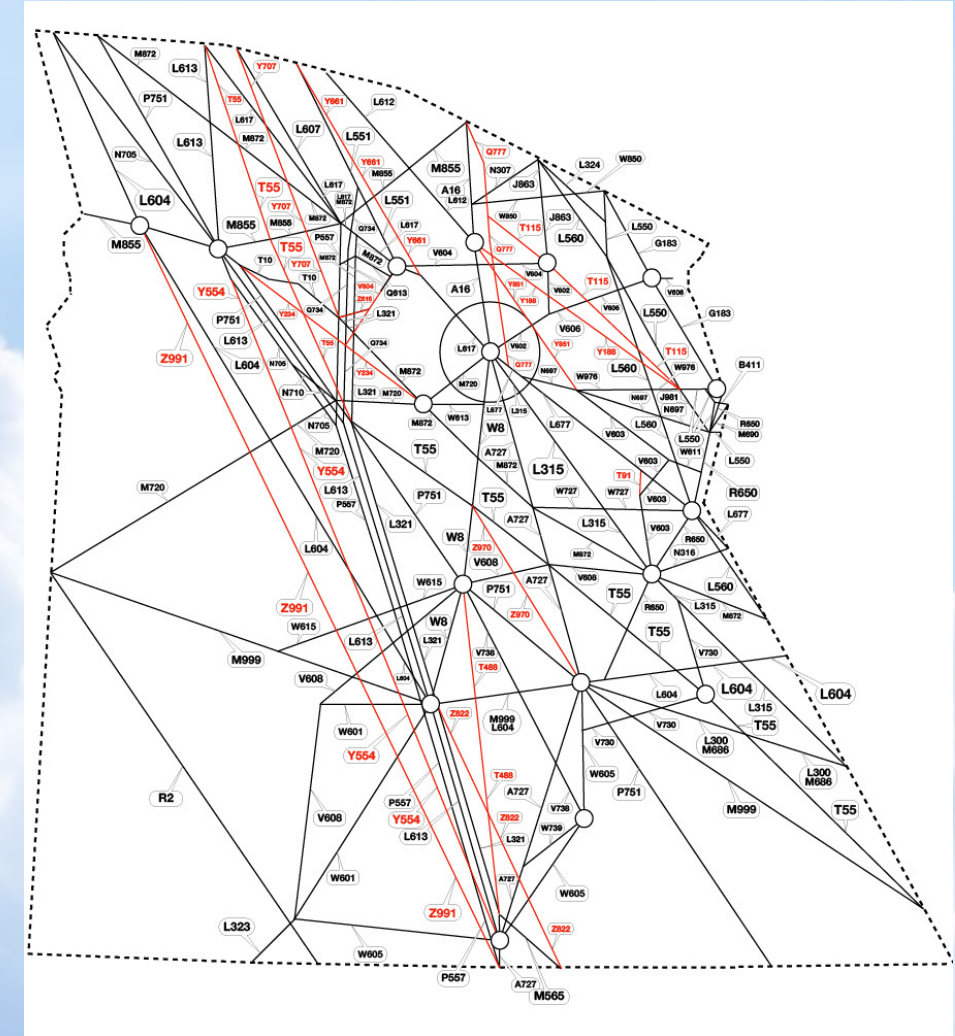
Area of responsibility

FIR Common Boundary with 7 ICAO States

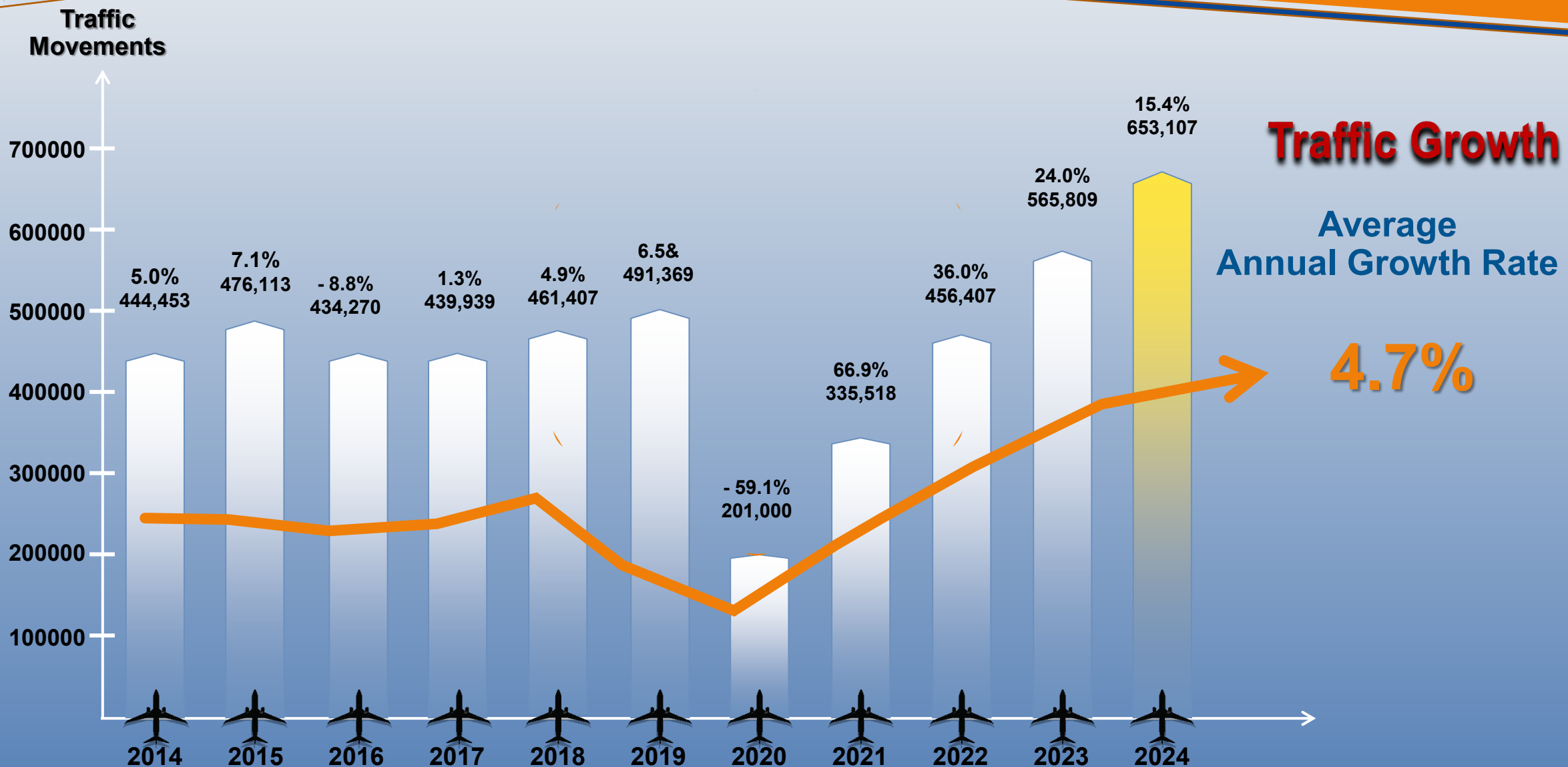**FIR**: more than *1.3 Million Km^2*

FIR Boundary of more than 2500 NM.

FIR: fully covered by VHF, HF, RADAR

12 Upper / lower airspaces covered with RDR

National Aviation Safety Plan

➢ EGYPT's strategic direction for civil aviation safety management for the period 2024-2025 cycle. This plan lists national aviation safety issues, presents a series of Safety Enhancement Initiatives (SEIs) to address safety deficiencies, and to achieve the identified national safety objectives, goals and targets.

➢ National Aviation Safety Plan considers other initiatives that serve existing and future national plans such (NANP) with attention to modernization, infrastructure and air traffic management systems. Constructive cooperation with security programs and environmental aspects requires coordinated and collaborative approach involving various stakeholders to ensure that our plans take into account compliance with international standards and the needs of all parties.

➢ In addition, ECAA will review and update the NASP by the end of 2025 then every 3 years or earlier, if required, to keep the identified operational safety risks, safety issues and selected SEIs updated and relevant.

EGYPTIAN CIVIL
AVIATION AUTHORITY

NASP 2024 - 2025
National Aviation Safety Plan
Arab Republic of Egypt
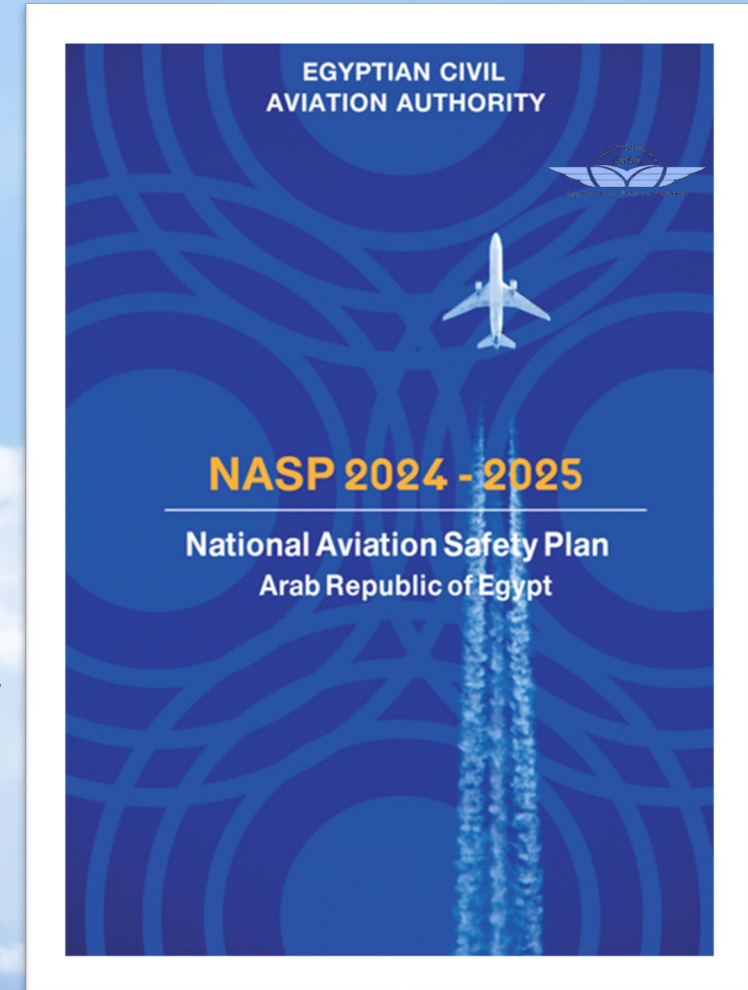
In compliance with the strategic goals and objectives of the NASP, and as a foundational element of NANSC Safety assurance is to **monitoring and review Safety Performance** through a range of formal safety review processes including Quantitative and Qualitative evaluation of a pre defined Safety Performance Indicators (SPI's).

A systematic approach used to define safety monitoring activities by pre-defining:

- Safety Performance Indicators (SPI's),

- Safety Targets, and

- Safety triggers (where applicable)..

- Implemented NANSC systematic Safety Monitoring Program has improved the probability of detecting weaknesses in the defenses of the safety system before occurrence of an active failure.

- NANSC Performance monitoring and Managment has been designed in a phased approached as a continuous process

The overall safety level is obtained through gross evaluation of recorded SPIs and SPTs where The minimum level of safety performance (as defined in State safety programmer SSP) *is expressed in terms of realistic Safety Performance Targets and Safety Performance Indicators (stated to as acceptable level of safety performance - ALoSP).*

❑ Organizational Risks SPI's, SPT's, and Triggers

Thirteen realistic SPIs that have been developed to measure integration of safety activities within each of the SMS 4 pillars.

NANSC (ANSP) SPIs

Leading (Proactive)

Lagging (Reactive)

Safety Culture	SMS Objectives	Monitoring	Hazards & Risks

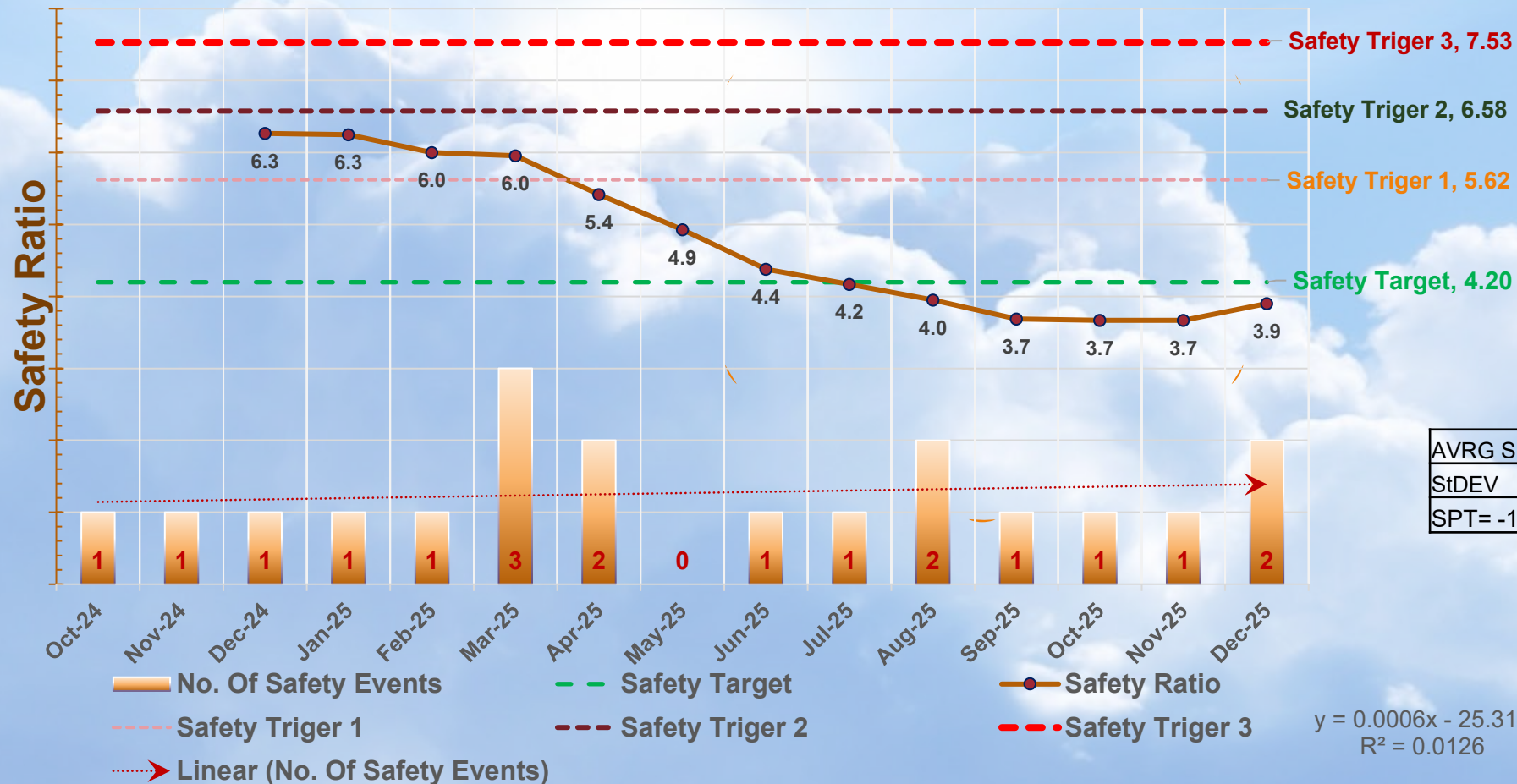| Numberr of Safety Courses per Annum (NSC) | Number of Safety Officers (NSO) | Number of Safety Publicationns per month (NSP) | Number of Volantry reports per month (NVR) | SMS integration Weight (SIW) | Number of Safety Reports /M (NSR) | Missed Approaches /M (MAPP) | Number of RT failures per month (RTF) | Number Nav aids & RDR Failure /M (NRF) | Safety Ratio (SR) | Number of Mandatory Reports per month (MSR) | STCA per month (STCA) | DAIW per month (DAIW) |

1. Safety Ratio (Safety events per 100,000 movements)

Safety Indicator	Safety Ratio (SR).Number of Safety events per 100000 Mvt.
SMS Pillar	Hazards & Risks. Leading and Lagging SPI – Operational.
Explanation	Safety Ratio' is used to measure the number of safety events per 100 000 movements. The safety ratio enables NANSC to verify that safety performance targets are met (level of safety performance). The safety ratio is calculated using a 12-month rolling average methodto reflect the overall safety performance for the stipulated period not as standalone monthly figure. The average is calculated monthly based upon the previous 12 months. Safety performance andassurance activities are both reactive and proactive activities. SR estimated by: $$SR = \frac{(\sum SE_{12m} \times 100000)}{\sum MVT_{12m}}$$ ***SR = Safety Ratio. -*** $\sum SE_{12m}$ ***= Total number of Safety Events rolled over the past 12 Months. -*** $\sum MVT_{12m}$ ***=Total MVTs for the past 12 Months.***
Baseline Performance (Target)	to decrease the safety ratio by certain percentage to ensure a healthy safety system.
Safety Triggers	three levels of Safety Triggers have been defined based on the **_Slandered Deviation_** nominal value of the average safety ration. (Safety Trigger 1 = AVRG SR +1SD - Safety Trigger 2 = AVRG SR +2(1SD) - Safety Trigger 3 =AVRG SR +3 (1SD)). Standard Deviation: a quantity expressing SR valuediffers differ from the mean value . StDEV is calculated using **σ=∑(xi- μ)^2N** where, μ is the mean, xi is value of SR, N is the size of population and ϭ is the standard deviation.
Relations	This SPI's can be compared mainly to SIW. ideally: **SR** ∝ **1 / SIW**

Examples of NANSC SPIs /SPTs

Example of Safety Ratio Report

NANSC Safety Ratio (Number of incidents per 100k movements)

Safety Triger 3, 7.53
Safety Triger 2, 6.58
Safety Triger 1, 5.62
Safety Target, 4.20

Safety Ratio values: 6.3, 6.3, 6.0, 6.0, 5.4, 4.9, 4.4, 4.2, 4.0, 3.7, 3.7, 3.7, 3.9

No. Of Safety Events: 1, 1, 1, 1, 1, 3, 2, 0, 1, 1, 2, 1, 1, 1, 2

Months: Oct-24, Nov-24, Dec-24, Jan-25, Feb-25, Mar-25, Apr-25, May-25, Jun-25, Jul-25, Aug-25, Sep-25, Oct-25, Nov-25, Dec-25

AVRG SR	4.677
StDEV	0.96
SPT= -10%=(90/100)*StDEV	

Legend:
- No. Of Safety Events
- Safety Target
- Safety Ratio
- Safety Triger 1
- Safety Triger 2
- Safety Triger 3
- Linear (No. Of Safety Events)

$y = 0.0006x - 25.317$
$R^2 = 0.0126$

Thank You

Hossam Ahmed