LAYER 4

4. PERFORMANCE, MONITORING AND REPORTING

1. Six step–based approach
2. Performance ambitions
3. Safety Management Considerations
4. SNAP Monitoring
   1. Process
   2. Implementation
   3. Performance

GACA

4. PERFORMANCE, MONITORING AND REPORTING

1. ICAO Performance-based approach (Six-step methodology)

ICAO Doc 9883 – Manual on Global performance of the Air Navigation System – and the ICAO Doc 9750 – Global Air Navigation Plan – introduced the concept of **Performance-Based Approach (PBA)** as the reference methodological approach to guide the evolution and modernization of ANS Industry towards a less regulated and more business–oriented environment. The performance–based approach (PBA) applied in this context is based on the following principles:

- informed decision making, motivated by the desired or required results;
- focus on desired or required results;
- decision making based on facts and data.

As the main reference document for the modernization of the ANS in the KSA, the SNAP is based on the PBA approach as it is described below:

1 DEFINITION OF SCOPE, CONTEXT, AMBITIONS AND EXPECTATIONS

Definition of the SNAP scope and context and of the KSA ANS Strategy & Policy as well as preliminary identification of performance ambitions and expectations through input data analysis and first round of Stakeholder Consultation

2 IDENTIFICATION OF OPPORTUNITIES & THREATS AND SETTING OF OBJECTIVES

Recognition of strengths, weaknesses, threats and opportunities for ANS modernization and initial identification of implementation objectives through a SWOT analysis

3 QUANTIFICATION OF OBJECTIVES

Analysis of the expected benefits to be delivered through the identified implementation objectives taking into account ICAO KPAs and KPIs

SELECTION OF SOLUTIONS 4

Identification of the most suitable deployment scenarios that ensure the achievement of the performance ambitions and expectations

IMPLEMENTATION OF SOLUTIONS 5

Definition of roadmaps by aggregating deployment scenarios for each Stakeholder category

REVIEW AND ASSESSMENT ON THE ACHIEVEMENT OF THE OBJECTIVES 6

Definition of methodology and process for monitoring and reporting on SNAP implementation and performance

PBA approach

2

4. PERFORMANCE, MONITORING AND REPORTING

4.2 ANS Key Performance Ambitions

The first step of the 6-step methodological approach foresees a preliminary identification of the Performance Ambitions to be achieved in the KSA by 2030 through the unfolding of the SNAP Projects.

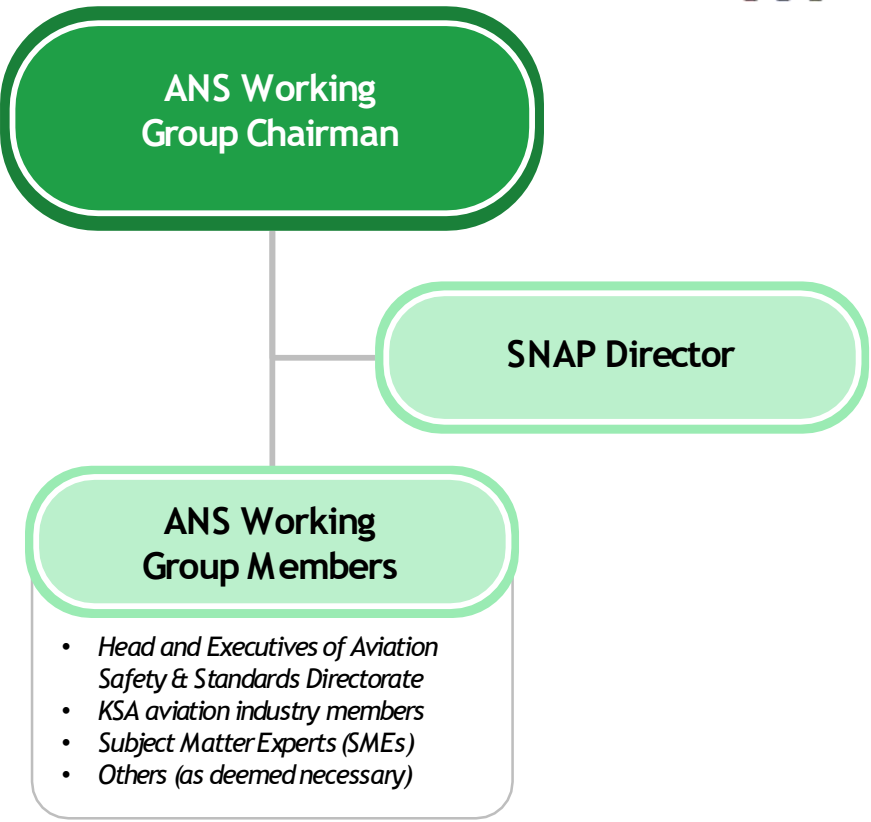| Key Performance Area	MID Strategy Prioritized KPAs	KSA high level goals
ACCESS & EQUITY	NO	*N/A*
CAPACITY	YES	Enable 3-fold increase in airspace capacity
OPERATIONAL EFFICIENCY	YES	Enable 50% increase in operational efficiency
COST-EFFECTIVENESS	NO	*N/A*
ENVIRONMENT	YES	Enable a reduction in the environmental impact of flights
FLEXIBILITY	NO	*N/A*
PREDICTABILITY	YES	Enable increased flight predictability
SAFETY	YES	Enable improving safety performance across all sectors
SECURITY	NO	*N/A*
GLOBAL INTEROPERABILITY	NO	*N/A*
PARTICIPATION BY THE ATM COMMUNITY	NO	*N/A*

4. PERFORMANCE, MONITORING AND REPORTING

4.3 Safety Management Considerations: Organizational chart, roles and responsibilities

Given the need to establish an information sharing mechanism between SNAP and NASP* and considering also the mission assigned to the different SSP Working groups, **the SSP ANS WG is identified as the appropriate arena to discuss safety-related risks/issues (emerging from the SNAP projects) and related mitigation actions.**
Below, the key people involved in the information sharing mechanism are outlined alongside their roles and responsibilities.

ORGANIZATIONAL CHART

ANS Working Group Chairman

SNAP Director

ANS Working Group Members

- *Head and Executives of Aviation Safety & Standards Directorate*
- *KSA aviation industry members*
- *Subject Matter Experts (SMEs)*
- *Others (as deemed necessary)*

ROLES AND RESPONSIBILITIES

ANS Working Group Chairman

- Chairing the group by setting objectives, moderating the discussion and liaising with stakeholders.
- Validating the identified mitigation solutions thus driving the decision-making process.

SNAP Director

- Coordinating safety information collection from SNAP Initiative PMs.
- Selecting major safety risks and issues common among local implementations of a Project and reporting them to the ANS WG.
- Supporting the identification of mitigation solutions.

ANS Working Group Members

- Reviewing safety data, trends, and SSP implementation plans affecting ANS.
- Reviewing other SSP and SSP-implementation related sources of information.
- Providing NASC with high level recommendations and mitigation actions to alleviate the risks identified in the ANS filed.
- Providing interim (quarterly) and final (every half-year) reports to NASC, including proposals for decision-making, resources allocation, safety promotions plan, and conflict resolutions.
- Define and review the Organizational Sector Safety Risk Profile.

* see §2.1 KSA Air Navigation Framework |2.1.5. The relationship between SSP/NASP and SNAP

4. SNAP Monitoring | 4.4.1 Process: Key Elements (1/2)

To ensure a comprehensive monitoring and reporting on the implementation of SNAP Projects and the performance variation generated by SNAP Projects' deployed, a **Monitoring Process,** orchestrated by GACA and involving all relevant stakeholders, has been defined.

The correct functioning of the Monitoring process requires:
- the clear identification of the objects to be monitored (**what**);
- the definition of roles & responsibilities involved in the process (**who**);
- the choice about the timing for the execution of the monitoring & reporting activities (**when**);
- the definition of the process flow and the identification of the tools that support such activities (**how**).

WHAT

The Monitoring Process focuses on collecting and analyzing data at Projects' local/site level. The data to be collected at local/site level might be either "Implementation Objects" and/or "Performance Objects":

IMPLEMENTATION OBJECTs
Implementation objects provide information about the status of the projects' local/site implementation and are collected while the projects are on-going.

- **Planning Baseline** | Start/End Date; Key Milestones' description, status & dates
- **Actual Planning** | Actual Start/End Date, Actual Milestones' description, status & dates
- **Planned Progress %** | can be automatically generated by the tool based on baseline data
- **Actual Progress %** | can be provided by each local / site project manager
- **Deviation %** | can be automatically generated by the tool based on confrontation between planned progress % and actual progress %.

PERFORMANCE OBJECTs
Performance objects provide information about the performance variations generated in relevant KPAs by the projects' local/site implementation and are collected once the projects are completed.

- **Performance variations** → calculated through the ICAO KPIs (and variants) associated with each Project.

WHO

For each Project's local/site implementation a **Project Manager** (also referred as "Local Project Managers" or LPM) shall be appointed by the Project Owner/Sponsor.

- When Projects are in the local/site implementation phase, Project Managers engage with involved Stakeholders, collecting information and overseeing the effective transmission of **Projects' status and progress data.**
- Before Projects are locally implemented, Project Managers engage with involved Stakeholders, collecting performance data on the KPAs associated with the Project to generate a **"performance baseline".**
- Once Projects are closed, Performance Monitoring Units (PMUs) engage with involved Stakeholders, collecting information and overseeing the reporting of **Projects' performance variations data.**

GACA supervises the overall Monitoring Process through the Tier 4 of the SNAP Governance Structure, the **SNAP Operational Committee.** Such entity is accountable for:
- Liaising with LPMs/PMUs to ensure timely collection of data.
- Following up on risk & issues emerging from the SNAP Projects' implementation.
- Aggregating data collected at Projects' local/site level to monitor the overall SNAP implementation and for the drafting of the Executive Reports.
- Publishing the Executive Reports.

4. PERFORMANCE, MONITORING AND REPORTING

4. SNAP Monitoring | 4.4.1 Process: Key Elements (2/2)

To ensure a comprehensive monitoring and reporting on the implementation of SNAP Projects and the performance variation generated by SNAP Projects' deployed, a **Monitoring Process,** orchestrated by GACA and involving all relevant stakeholders, has been defined.

The correct functioning of the Monitoring process requires:
- the clear identification of the objects to be monitored (**what**);
- the definition of roles & responsibilities involved in the process (**who**);
- the choice about the timing for the execution of the monitoring & reporting activities (**when**);
- the definition of the process flow and the identification of the tools that support such activities (**how**).

WHEN

The complexity of SNAP requires a structured and time–boxed approach to monitor projects' implementation and performance, while ensuring the timely production and publication of Executive Reports. Therefore, three types of monitoring are foreseen:

- **Implementation (Recurrent Gates) Monitoring**: once every 6 months, Project Managers must communicate and/or update information on the local/site implementations status. At such gates, the SNAP Operational Committee freezes the collected information, aggregates it for SNAP overall implementation monitoring purposes and consolidates it in the Executive Report.

- **Performance Monitoring:** on a yearly basis, Project Managers communicate information on the performance variation generated by the local/site implementation on relevant KPAs against the performance baseline.

- **Continuous monitoring:** at any time during projects' implementation phase, the SNAP Operational Committee may request Project Managers to communicate and/or update data regarding the status of their project/s (in percentage points), as well as changes in scope, emerging risks and issues. The SNAP Operational Committee may also request ad–hoc data regarding performance variation that the project is generating.

HOW

The entire Monitoring Process shall be supported by the adoption of tools aimed at:
- Easing information exchange between GACA and the Stakeholders/Project Managers.
- Gathering data regarding the SNAP projects.
- Publishing information related to the progress status of the SNAP Deployment Roadmap (e.g., Dashboards, Reports, etc.).

Such tools are:
- The Project Portfolio Management Tool.
- The **SNAP Web App** linked to GACA website.
- The template for the drafting of the Executive Reports.

The upload of data collected at project level in the SNAP Web App is responsibility of the **Project Owners/Sponsors** through their appointed Project Manager. Project Managers are therefore provided with access credentials to log–in, visualize their own projects and submit/update data.

The **SNAP Operational Committee** is responsible for uploading aggregated data to monitor the overall SNAP implementation.

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring |4.4.2 Implementation: Recurrent Gates Monitoring Process Flow

The implementation monitoring takes place on a semi–annual basis. The different steps of the **Recurring Gates Monitoring Process**, used to collect Implementation Objects, are described below:

STEPS	ACTIVITY	OWNER	TIMING	DESCRIPTION
1	LPM appointment	Project Owner /Sponsor	Project start date -1 Month	The Project Owner/Sponsor **appoints a Local Project Manager (LPM)**. The LPM is responsible for disseminating towards the Stakeholders the information necessary for the implementation monitoring activity (the methodology, the timing, the KPIs to be used, etc.).
2	Data collection & Control Checks	LPM	Gate -2 Weeks	Data collection starts 2 weeks before the established gate. During this phase, the **LPM engages with stakeholders to collect data on Project status and progress**. Once data is available, the LPM performs **control checks** on data presence and conformity, making sure data is correctly structured based on the proposed Projects KPIs (*see §4.4.2*). Then the LPM transmits to GACA the information and uploads it on the dedicated online Web portal.
3	Consultation & data validation	SNAP Operational Committee	Gate +1 Week	After the LPM transmission and upload of Project data, GACA might request **consultation sessions** with Stakeholders to ask for clarifications and/or confront on possible Projects' unsatisfactory progresses. Following the optional consultations, **GACA performs data validation** through the SNAP Operational Committee. Consultations and data validation can take no more than 1 week. When data validation is completed, Gate exercise is declared as closed and LPMs have no longer the opportunity to transmit or upload new data.
4	Data aggregation	SNAP Operational Committee	Gates +2 Weeks	The SNAP Operational Committee uses the proposed SNAP KPIs (see §4.4.2) to **aggregate data** collected at projects level and monitor the status and progress of SNAP and/or single Initiatives.
5	Reports Drafting & Publication	SNAP Operational Committee	Gates +3 Weeks	The SNAP Operational Committee **produces operational and executive reports,** also publishing such documentation in a dedicated area of GACA website for SNAP.

7

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring | 4.4.2 Implementation: Projects Key Performance Indicators

The KPIs proposed below are Project Management KPIs thought to be applied for measuring Implementation Objects and for monitoring the progress of SNAP Projects.

Progress monitoring KPI	Description	Formula
Project Implementation (measured as the Δ% between actual progress % and planned progress %)	KPI_1 aims at monitoring the advancement of each Project considering its actual % progress and confronting it with the Project's planned % progress. - Positive % = in advance - 0% = on track - Negative % = delay	(actual % progress) – (planned % progress) / (planned % progress)
Project Milestones' achievement rate	KPI_2 aims at monitoring the advancement of each Project considering the ratio between milestones achieved and total number of milestones (baseline) associated with that Project	N° of milestones "achieved" / Tot N° of milestones

Risk & Issue Monitoring KPI	Description	Formula
Risk Management Effectiveness	KPI_3 aims at monitoring the effectiveness of the risk management system at Project level	N° of key risks* "mitigated" / Tot number of risks
Issue Management Effectiveness	KPI_4 aims at monitoring the effectiveness of the issue management system at Project level	N° of key issues** "remediated" / Tot number of issues

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring | 4.4.2 Implementation: SNAP Key Performance Indicators

The KPIs proposed measure the overall progress of SNAP and/or in a single Initiative implementation.

Progress monitoring KPI	Description	Formula
SNAP Implementation (expressed as the Δ% between actual progress % and planned progress %)	KPI_1 aims at monitoring the general advancement of SNAP deployment roadmap by aggregating actual % progress of the whole set of Projects (x, y, z, …., n) under SNAP and confronting the average % progress of those projects with the roadmap planned % progress baseline. - Positive % = in advance - 0% = on track - Negative % = delay	$[(\%x + \%y + \%z +…+ \%n) / x+y+z+…+n]$ – SNAP Planned % progress / SNAP Planned % progress
Initiative Implementation (expressed as the Δ% between actual progress % and planned progress %)	KPI_2 aims at monitoring the advancement in the implementation of each Initiative calculated by aggregating actual % progress of Projects associated with that Initiative (p1, p2, p3, …., pn) and confronting the average % progress of those projects with the Initiative's planned % progress baseline. - Positive % = in advance - 0% = on track - Negative % = delay	$[(\%p1 + \%p2 + \%p3 + … + \%pn) / p1+p2+p3+…+pn]$ – Initiative Planned % progress / Initiative Planned % progress

Risk & Issue Monitoring KPI	Description	Formula
Key Risk Management Effectiveness	KPI_3 aims at monitoring the effectiveness of the risk management system at SNAP deployment roadmap level	N° of key risks* "mitigated" / Tot number of risks
Key Issue Management Effectiveness	KPI_4 aims at monitoring the effectiveness of the issue mgmt system at SNAP deployment roadmap level	N° of key issues** "remediated" / Tot number of issues

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring |4.4.3 Performance: Methodology for measuring the performance variation

The performance variation analysis starts when a Project has delivered its final output, and the new concept (system) is effectively in place and operational. The functioning of the **Performance Monitoring**, used to collect Performance Objects, is described below:

STEPS	ACTIVITY	OWNER	TIMING	DESCRIPTION
1	PPM appointment	*Project Owner*	*Project start date -1 Month*	The Project Owner/Sponsor appoints a **Performance Project Manager - who might or might not coincide with the LPM -** is responsible for disseminating towards the Stakeholders the information necessary for the performance monitoring activity (the methodology, the timing, the KPIs to be used, etc.).
2	KPIs variants selection	*PPM*	*Project start date - 3 weeks*	Considering the **benefits expected** from the local implementation of the Project, the **PPM checks which variants should be used** for that measurement of the KPIs **in ICAO MID Doc 002 and MID eANP Volume III.** When variants are not indicated, all the PPMs responsible for the local implementations, agree on the variant and the associated methods for calculation to be used. Then, each PPM conveys such information to all stakeholders involved in the performance monitoring activity.
3	Performance baseline definition	*PPM*	*TBD*	Once variants to be used are checked or selected, PPMs, with the support the Stakeholders involved in the measuring process, apply the variants on historical data to set up a **performance baseline for each relevant KPA affected by the Project**
4	Data collection & Control Checks	*PMU*	*Project end-date + 1 year*	After 12 month from the Project transition into operation, the **relevant local Performance Monitoring Unit (PMU) engages with stakeholders to solicit the timely transmission of data on performance variations** generated by the Project's implementation. The PMU performs **control checks** on data presence and conformity, ensuring that data are correctly structured based on the proposed ICAP KPIs variants (*see §4.5.5*).
5	Performance variation output	*PMU*	*Project end-date + 1 year*	Once the presence and correct structuring of the data has been checked, the PMU compares the data received with the performance baseline to generate a **performance variation output for each relevant KPA impacted by the Project.** Such outputs is eventually transmitted to GACA through the Web–portal
6	Consultation, aggregation & data validation	*SNAP Operational Committee*	*Project end-date + 13 months*	After the PMU transmission and upload of data, GACA might request **consultation sessions** with Stakeholders to ask for clarifications and/or confront on possible Projects' unsatisfactory performance. Following the optional consultations, **GACA performs data aggregation** (through the IPM) **, validation** (through the SNAP Operational Committee) **and upload on the Web-portal.**
7	Reports Drafting & Publication	*SNAP Operational Committee*	*Project end-date + 14 months*	The SNAP Operational Committee **produces synthesis views and executive reports and publishes such documentation** in a dedicated area of GACA website.

In 2030, the SNAP Operational Committee collects the validated performance variation outputs generated on each relevant KPA by all the Projects concluded in RFP1 (2025–2029).
By summing up such performance outputs, the SNAP Governance can determine the **national performance variation** on each KPA and confront it with KSA Performance Ambitions (see §4.2).

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring |4.4.3 Performance: KPIs variants and method of calculations (1/5)

The stakeholders performing the KPIs appraisal should be aware of the variants to be used and the associated methods of calculation. An initial list of variant and methods for some of the KPIs was identified at Middle-East regional level (MID ANS Strategy – ICAO MID Doc 002 and MID eANP Volume III) and it is reported in the table below:

KPI (KPAs)	Title/Definition	Measurement Units	Variants	Data requirement	Formula/Algorithm	Timeframe
KPI 01 (Access & Equity, Efficiency, Cost Effectiveness)	**Departure punctuality** Percentage of flights departing from the gate on-time (compared to schedule).	% of flights	Variant 2A – % of departures within ± 15 minutes of scheduled time of departure	For each departing scheduled flight: –List of all IFR scheduled departure for each international aerodrome –Scheduled time of departure (STD) or Scheduled off-block time (SOBT) –Actual off-block time (AOBT)	**At the level of individual flights:** 1. Exclude non-scheduled departures 2. Categorize each scheduled departure as on-time or not **At aggregated/National level:** 3. Compute the KPI: number of on-time departures divided by total number of IFR scheduled departures	1 month
KPI 02 (Capacity, Efficiency, Cost effectiveness Environmental Impact)	**Taxi-out additional time** Actual taxi-out time compared to an unimpeded/reference taxi-out time.	Excess taxi-out time in Minutes / flight	Variant 1 – basic (computed without departure gate and runway data)	For each departing flight: –List of all IFR departures for each international aerodrome –Actual off-block time (AOBT) –Actual take-off time (ATOT)	**At the level of individual flights:** 1. Select departing flights, exclude helicopters 2. Compute actual taxi-out duration: ATOT minus AOBT 3. Compute additional taxi-out time: actual taxiout duration minus unimpeded/reference taxi-out time **At aggregated/National level:** 4. Compute the KPI: sum of additional taxi-out times divided by number of IFR departures	1 month
KPI 03 (Capacity, Cost Effectiveness)	**ATFM slot adherence** Percentage of flights taking off within their assigned ATFM slot (Calculated Take-Off Time Compliance)	% of flights subject to flow restrictions	Variant to be selected from those available in the GANP	–	–	–
KPI 04 (Access & Equity, Efficiency, Environmental Impact, Cost effectiveness)	**Filed FP enroute extension** Flight planned en-route distance compared to a reference ideal trajectory distance.	% excess distance	Variant to be selected from those available in the GANP	–	–	–

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring | 4.4.3 Performance: KPIs variants and method of calculations (2/5)

The stakeholders performing the KPIs appraisal should be aware of the variants to be used and the associated methods of calculation. An initial list of variant and methods for some of the KPIs was identified at Middle-East regional level (MID ANS Strategy – ICAO MID Doc 002 and MID eANP Volume III) and it is reported in the table below:

KPI (KPAs)	Title/Definition	Measurement Units	Variants	Data requirement	Formula/Algorithm	Timeframe
KPI 05 (Access & Equity, Efficiency, Environmental Impact, Cost effectiveness)	**Actual enroute extension** Actual en-route distance flown compared to a reference ideal distance	% excess distance	Variant to be selected from those available in the GANP	–	–	–
KPI 06 (Capacity)	**En-route airspace capacity** The maximum volume of traffic an airspace volume will safely accept under normal conditions in a given time period.	Movements /Hour	Variant to be selected from those available in the GANP	–	–	–
KPI 08 (Efficiency, Environmental Impact, Cost effectiveness)	**Additional time in terminal space** Actual terminal airspace transit time compared to an unimpeded time. Actual trajectories are generally longer in time and distance due to path stretching and/or holding patterns.	Minutes / flight	Variant to be selected from those available in the GANP	–	–	–
KPI 09 (Capacity)	**Airport peak capacity** The highest number of operations an airport can accept in a one-hour time frame (also called declared capacity). Can be computed for arrivals, departures or arrivals + departures.	Number of arrivals/ Hour	Variant to be selected from those available in the GANP	–	–	–

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring | 4.4.3 Performance: KPIs variants and method of calculations (3/5)

The stakeholders performing the KPIs appraisal should be aware of the variants to be used and the associated methods of calculation. An initial list of variant and methods for some of the KPIs was identified at Middle-East regional level (MID ANS Strategy – ICAO MID Doc 002 and MID eANP Volume III) and it is reported in the table below:

KPI (KPAs)	Title/Definition	Measurement Units	Variants	Data requirement	Formula/Algorithm	Timeframe
KPI 10 (Capacity)	**Airport Peak Throughput** The 95th percentile of the hourly number of operations recorded at an airport, in the "rolling" hours sorted from the least busy to the busiest hour. Can be computed for arrivals, departures or arrivals + departures	Number of departures/ hour, Number of landings / hour, Number (departures+ landings)/hour	Variant to be selected from those available in the GANP	–	–	–
KPI 11 (Capacity, Efficiency, Security)	**Airport Throughput Efficiency** Airport throughput (accommodated demand) compared to capacity or demand, whichever is lower. Can be computed for arrivals, departures or arrivals+departures	Average Over/Under Delivery or % of accommodated operations	Variant to be selected from those available in the GANP	–	–	–
KPI 13 (Efficiency – Environmental Impact, Cost effectiveness)	**Taxi-in additional time** Actual taxi-in time compared to an unimpeded/reference taxi-out time.	Excess taxi-in time in Minutes/ Flight	Variant 1 – basic (computed Without arrival gate and runway data)	For each arriving flight: –List of all IFR scheduled Arrivals for each international aerodrome –Actual landing time (ALDT) –Actual in-block time (AIBT)	**At the level of individual flights:** 1. Select arriving flights, exclude helicopters 2. Compute actual taxi-in duration: AIBT minus ALDT 3. Compute additional taxi-in time: actual taxi-in duration minus unimpeded/reference taxi-in time	1 month
KPI 14 (Efficiency)	**Arrival punctuality** Percentage of flights arriving at the gate ontime (compared to schedule)	% of flights	Variant 2A – % of arrivals within ± 15 minutes of scheduled time of arrival	For each arriving scheduled flight: –List of all IFR scheduled arrival for each international aerodrome –Scheduled time of arrival (STA) or Scheduled in-block time (SIBT) –Actual in-block time (AIBT)	2. Categorize each scheduled arrival as on-time or not **At aggregated/National level:** 3. Compute the KPI: number of on-time arrivals divided by total number of scheduled arrivals	1 month

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4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring | 4.4.3 Performance: KPIs variants and method of calculations (4/5)

The stakeholders performing the KPIs appraisal should be aware of the variants to be used and the associated methods of calculation. An initial list of variant and methods for some of the KPIs was identified at Middle-East regional level (MID ANS Strategy – ICAO MID Doc 002 and MID eANP Volume III) and it is reported in the table below:

KPI (KPAs)	Title/Definition	Measurement Units	Variants	Data requirement	Formula/Algorithm	Timeframe
KPI 15 (Efficiency, Environmental Impact, Cost effectiveness, Flexibility, Predictability)	**Flight time variability** Distribution of the flight (phase) duration around the average value	Minutes / flight	Variant to be selected from those available in the GANP	–	–	–
KPI 16 (Access & Equity, Efficiency, Environmental Impact)	**Additional fuel burn** Additional flight time/distance and vertical flight inefficiency converted to estimated additional fuel burn attributable to ATM	kg fuel/ flight	Variant to be selected from those available in the GANP	–	–	–
KPI 17 (Efficiency, Environmental Impact, Cost effectiveness)	**Level-off during climb** Distance and time flown in level flight before Top of Climb.	NM/flight and minutes/flight	Variant to be selected from those available in the GANP	–	–	–
KPI 18 (Efficiency, Environmental Impact, Cost effectiveness)	**Level capping during** Flight Level difference between maximum Flight Levels on a measured airport pair and maximum Flight Levels on similar unconstrained airport pairs	Flight Levels/ flight	Variant to be selected from those available in the GANP	–	–	–
KPI 19 (Efficiency, Environmental Impact, Cost	**Level-off during descent** Distance and time flown in level flight after Top of Descent	NM/flight and minutes/flight	Variant to be selected from those available in the GANP	–	–	–

14

4. PERFORMANCE, MONITORING AND REPORTING

4.4 SNAP Monitoring | 4.4.3 Performance: KPIs variants and method of calculations (5/5)

The stakeholders performing the KPIs appraisal should be aware of the variants to be used and the associated methods of calculation. An initial list of variant and methods for some of the KPIs was identified at Middle-East regional level (MID ANS Strategy – ICAO MID Doc 002 and MID eANP Volume III) and it is reported in the table below:

KPI (KPAs)	Title/Definition	Measurement Units	Variants	Data requirement	Formula/Algorithm	Timeframe
KPI 20 (Safety)	**Number of Aircraft Accidents** Accident' is defined in ICAO Annex 13, Chapter 1–Definitions; ADREP: Accident Data Report	Number of accidents/ year	Variant 1 (GASP): Aircraft MTOW > 2 250 kg 1.1 National accident occurrence level	–	–	–
KPI 21 (Safety)	**Number of RWY Incursions** Number of occurrences at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft. (CICTT Taxonomy definition)	Number of runway incursions/ year	None	–	–	–
KPI 22 (Safety)	**Number of RWY Excursions** Number of veer offs or overruns of the runway surface	Number of runway excursions/ year	None	–	–	–
KPI 23 (Safety)	**Number of Airprox/TCAS Alert/Loss of separation/Near mid-air Collisions/Mid Air Collisions** Number of airproxes, TCAS alerts, loss of separation as well as near collisions or collisions between aircraft in flight.	Number of airprox/TCAS alert/loss of separation/ near midair collisions/mid air collisions (MAC)/ year	Variant to be selected from those available in the GANP	–	–	–