



## DIRECTORS GENERAL OF CIVIL AVIATION-MIDDLE EAST REGION

### Fourth Meeting (DGCA-MID/4) (Muscat, Oman, 17-19 October 2017)

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#### Agenda Item 3: Managerial Issues

#### ICAO AVIATION TRAINING AND CAPACITY-BUILDING ROADMAP

*(Presented by the Secretariat)*

##### SUMMARY

This information paper presents the ICAO Aviation Training and Capacity-Building Roadmap, as a practical guide for States.

##### REFERENCES

ICAO Aviation Training and Capacity-Building Roadmap for States –  
A Practical Guide

## 1. INTRODUCTION

1.1 Sustainable, safe and secure global aviation development relies on availability of qualified and competent employees, supervisors and managers to plan, coordinate, manage, operate, maintain and oversee all complex operations in various airports, airspaces, airplanes, etc. An aviation training and capacity-building roadmap will assist the ICAO Member States in the development of plans to ensure they have the required human resources, skills, technology and operational environment to carry out all aviation activities in compliance with ICAO provisions, plans, programmes and required performance specified in ICAO Standards and Recommended Practices (SARPs).

## 2. DISCUSSION

2.1 The development of an aviation training and capacity-building roadmap to assist ICAO Member States in their capacity-building effort, was initiated by the ICAO Council during the 2015 Council Off-site Strategy Meeting, under the theme “Training and Capacity-Building in Civil Aviation”.

2.2 The ICAO Aviation Training and Capacity-Building Roadmap at **Appendix A** is a strategic document that outlines the human resource requirements for a State to achieve its national objectives in air transportation. The outcomes of the roadmap are related to the resolution of performance problems identified in State’s audit reports or expected performance problems identified through a gap analysis.

2.3 For Civil Aviation Authorities (CAAs) and aviation service providers, the purpose of the training and capacity-building roadmap is to provide a structured plan of actions, to implement a comprehensive and consistent human resources development strategies for their staff including adequate education, training and qualification programmes, in order to meet the State's strategic objectives, development goals and needs of the aviation sector. It provides also guidance to States for preparing, developing, implementing and evaluating a training and capacity-building roadmap for their civil aviation activities.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to note the availability of the ICAO Aviation Training and Capacity-Building Roadmap at **Appendix A** to be used as a practical guide for States.

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# **AVIATION TRAINING AND CAPACITY-BUILDING ROADMAP FOR STATES**

**A PRACTICAL GUIDE**



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## 1. Introduction

### 1.1. Need for an aviation training and capacity-building roadmap for States

- a) Sustainable, safe and secure global aviation development rely on availability of qualified and competent employees, supervisors and managers to plan, coordinate, manage, operate, maintain and oversee all complex operations in various airports, airspaces, airplanes, etc. An aviation training and capacity-building roadmap will assist the International Civil Aviation Organization (ICAO) Members in the development of plans to ensure they have the required human resources, skills, technology and operational environment to carry out all aviation activities in compliance with ICAO provisions, plans, programmes and required performance specified in ICAO Standards and Recommended Practices (SARPs).
- b) An aviation training and capacity-building roadmap is a strategic document that outlines the human resource requirements for a State to achieve its national objectives in air transportation. The outcomes of the roadmap are related to the resolution of performance problems identified in State's audit reports or expected performance problems identified through a gap analysis, as it will be explained in Sections 3, 4, 5, 6 and 7 of this document. It will also identify national education and training institutions that contribute to meeting training needs by naming existing programmes offered by universities, academies, private and government (civil aviation authorities) training institutions, colleges or other post-secondary institutions that graduate qualified personnel for occupations in air transport.

### 1.2. General advantages of a roadmap

- a) For Civil Aviation Authorities (CAAs) and aviation service providers, the purpose of this training and capacity-building roadmap is to provide a structured plan of actions, as indicated in Sections 4, 5, 6 and 7, to implement a comprehensive and consistent human resources development strategies for their staff including adequate education, training and qualification programmes, in order to meet the State's strategic objectives, development goals and needs of the aviation sector.
- b) At a high level, the roadmap will:
  - facilitate reaching a consensus about a set of goals, objectives, steps and required needs;
  - provide a mechanism to create and implement criteria to ensure objectives and timelines are met;
  - provide a framework that guide stakeholders and project teams in planning and coordinating their activities; and
  - demonstrate how national capacity-building will meet global objectives and conform with ICAO SARPs.
- c) At a detailed level, the roadmap will provide CAAs and aviation service providers plans of actions to ensure they meet capacity needs in terms of occupations, to develop or maintain the number of employees and managers for each national objective and their essential qualifications, recruitment, training and retention policies, and succession planning.

## 2. Context: aviation training is a global concern

### 2.1. Recommendation from the Council Off-site Strategy Meeting

- a) The development of an aviation training and capacity-building roadmap to assist ICAO Member States in their capacity-building effort, was initiated by the ICAO Council during the 2015 Council Off-site Strategy Meeting, under the theme “Training and Capacity-Building in Civil Aviation”. In addition to the President of the ICAO Council, the ICAO Secretary General and the President of the Air Navigation Commission, 78 participants took part in this meeting, representing all Member States on the Council, eight Representatives to ICAO, representatives of international organizations specialized in aviation, and ICAO Senior Management.
- b) The results of the Political, Economic, Social and Technological (PEST), and Strengths, Weaknesses, Opportunities and Threats (SWOT) analyses conducted during the meeting were a number of strategies and steps to be taken by ICAO, and identified and presented in a Council working paper (C-WP/14329). One of the actions was for ICAO to “establish a roadmap for Member States linking training and capacity-building needs to a State Master Plan for the development of aviation and results of a Training Needs Assessment.” Section 3 of this document describes a general approach for the development of such a roadmap, Figure 3 illustrates how the links are perceived in this document and additional information on its implementation is provided in Sections 4, 5, 6 and 7 using a phased approach.

### 2.2. Expected aviation growth

- a) Air transport activities are expected to double over the next 15 years with a clear implication on shortage of qualified employees, supervisors and managers in various positions in the aviation industry and regulatory functions. The aviation community therefore needs to ensure there are enough qualified employees, supervisors and managers for airlines, airports, air navigation services, and regulatory functions to support this growth. Efforts to develop essential talents must reflect the principles and practices of human performance improvement and lead to measurable outcomes.

### 2.3. ICAO standards for training and qualification of personnel

- a) ICAO is concerned about global performance of aviation systems, if they are operated, maintained, and managed by individuals trained with different programmes and standards, and unable to achieve the same human performance at their work. The expected and projected changes in the aviation systems, equipment, ICAO SARPs, technology, demographic changes of the workforce, etc. will additionally impact the occupational skill levels, qualification requirements, and training needs.
- b) Globally harmonized strategies addressing aviation training activities are therefore essential for capacity-building plans established by ICAO Member States. In this regard, ICAO Assembly Resolution A38-12, Appendix D, and the ICAO Civil Aviation Training Policy, approved by the ICAO Council, identify the scope of ICAO activities in training and assistance to Member States for achieving and maintaining competency of aviation personnel through ICAO aviation training.

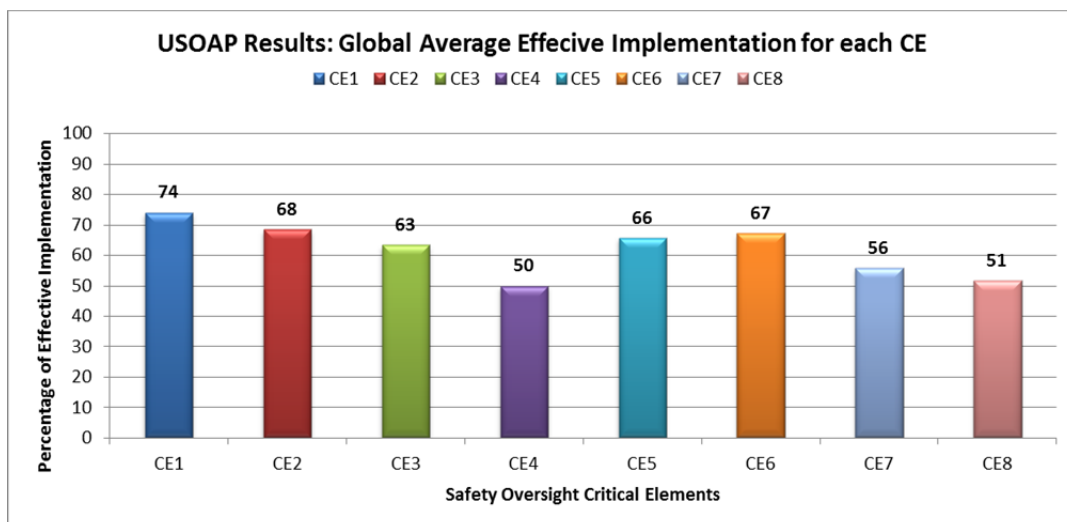
### 2.4. Universal Safety Oversight Audit Programme results

- a) The Universal Safety Oversight Audit Programme (USOAP) was launched by ICAO in 1999 to assess its Member States’ capabilities to conduct safety oversight of their aviation industry.
- b) ICAO Member States, in their effort to establish and implement an effective safety oversight system, need to consider the critical elements (CEs) for safety oversight. Critical elements of a

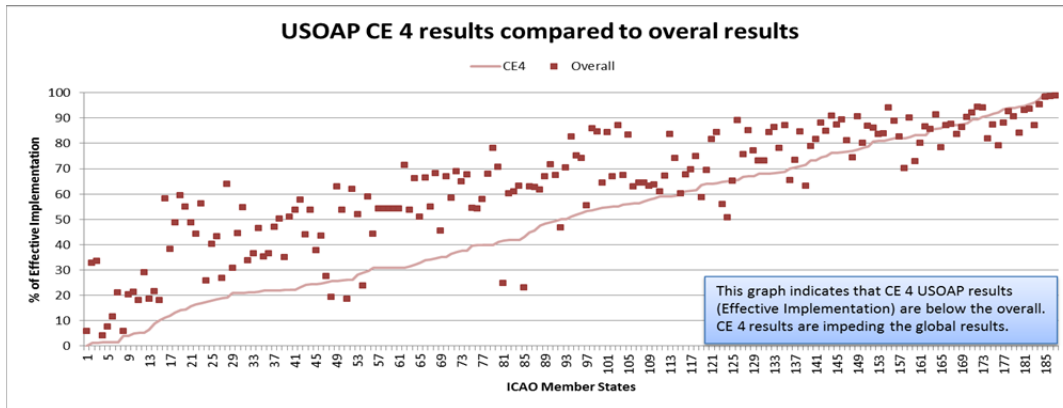
safety oversight system encompass the whole spectrum of civil aviation activities, including areas, such as aerodromes, air traffic control, communications, personnel licensing, flight operations, airworthiness of aircraft, accident/incident investigation, and transport of dangerous goods by air.

- c) Through USOAP, ICAO audits the effective implementation of the following critical elements, as an indication of a State's capability for safety oversight:
- CE 1: primary aviation legislation;
  - CE 2: specific operating regulations;
  - CE 3: State civil aviation system and safety oversight functions;
  - CE 4: technical personnel qualification and training;
  - CE 5: technical guidance, tools and the provision of safety-critical information;
  - CE 6: licensing, certification, authorization and approval obligations;
  - CE 7: surveillance obligations; and
  - CE 8: the resolution of safety concerns.
- d) USOAP provides a good example of effectiveness of qualification and training of staff employed by a CAA on the performance of a State's safety oversight system (influence of CE 4 on the overall Effective Implementation (EI) of CEs).
- e) Figure 1 depicts the global average results of ICAO USOAP audits for all audited States, in terms of EI of all CEs. Global results of CE 4, staff qualification and training, indicates 50% of effective implementation and are therefore the lowest results. In fact, they have a negative impact on CE 8 (51%), CE 7 (56%), and CE 6 (67%) because without qualified inspectors (better results for CE 4), EI of CE 6, CE 7 and CE 8, which are key State performances for the implementation of a safety oversight system, are lower. These results demonstrate how low qualification of personnel (aviation safety inspectors in this case) has a negative impact on the safety oversight system for some States, and on the global harmonization of civil aviation.

**Note:** USOAP data used in this document were generated from ICAO ISTARs in June 2016.



**Figure 1 – USOAP EI Results**



**Figure 2 – USOAP CE Results**

- f) Figure 2 above depicts the results of CE4 (continuous line) and the overall EI for each of the 191 ICAO Member States. For most States, EI of CE4 (the continuous line) is below the average EI (dots). Improving CE 4 results (by improving staff qualification and training) will contribute to improve USOAP results for those States and the global average results, as well.

## 2.5. Identified issues

- a) USOAP results confirm the following issues that should be addressed in an aviation training and capacity-building roadmap for civil aviation authorities:
- training programmes not adequately identified;
  - training plans not established;
  - training plans not implemented;
  - training not adequately recorded;
  - funding not available;
  - required competencies for current jobs and tasks not identified (issues related to training and qualification of current staff); and
  - required competencies for future tasks and jobs not identified (issues related to training of the future generation).

## 3. General approach for the development of an aviation training and capacity-building roadmap

- a) Figure 3 presents the links between a State Aviation Master Plan (or equivalent documents), Training Needs Assessments (TNAs) and an Aviation Training and Capacity-building Roadmap. The starting point for the development of a roadmap is a list of activities to be included in the roadmap’s plans of actions, called “roadmap operational plans” in this document (roadmap operational plans are indicated in Figure 3, Column C and explained in Sections 5, 6 and 7). The list of activities is generated from the preliminary work detailed in Figure 3, Columns A and B. The data and information contained in the strategic document (a State Aviation Master Plan or equivalent documents) as indicated in Column A, plus the results from the TNAs conducted in Column B, provide the basis for the roadmap operational plans (and their coordinated implementation plans) in Column C.
- b) The deliverables of a State Aviation Master Plan (or equivalent documents) will therefore provide the scope of TNAs at the level of a State, addressing all organizations (CAAs and service providers). In



return, TNAs results will determine a list of operational activities that form the components of the aviation training and capacity-building roadmap (roadmap operational plans).

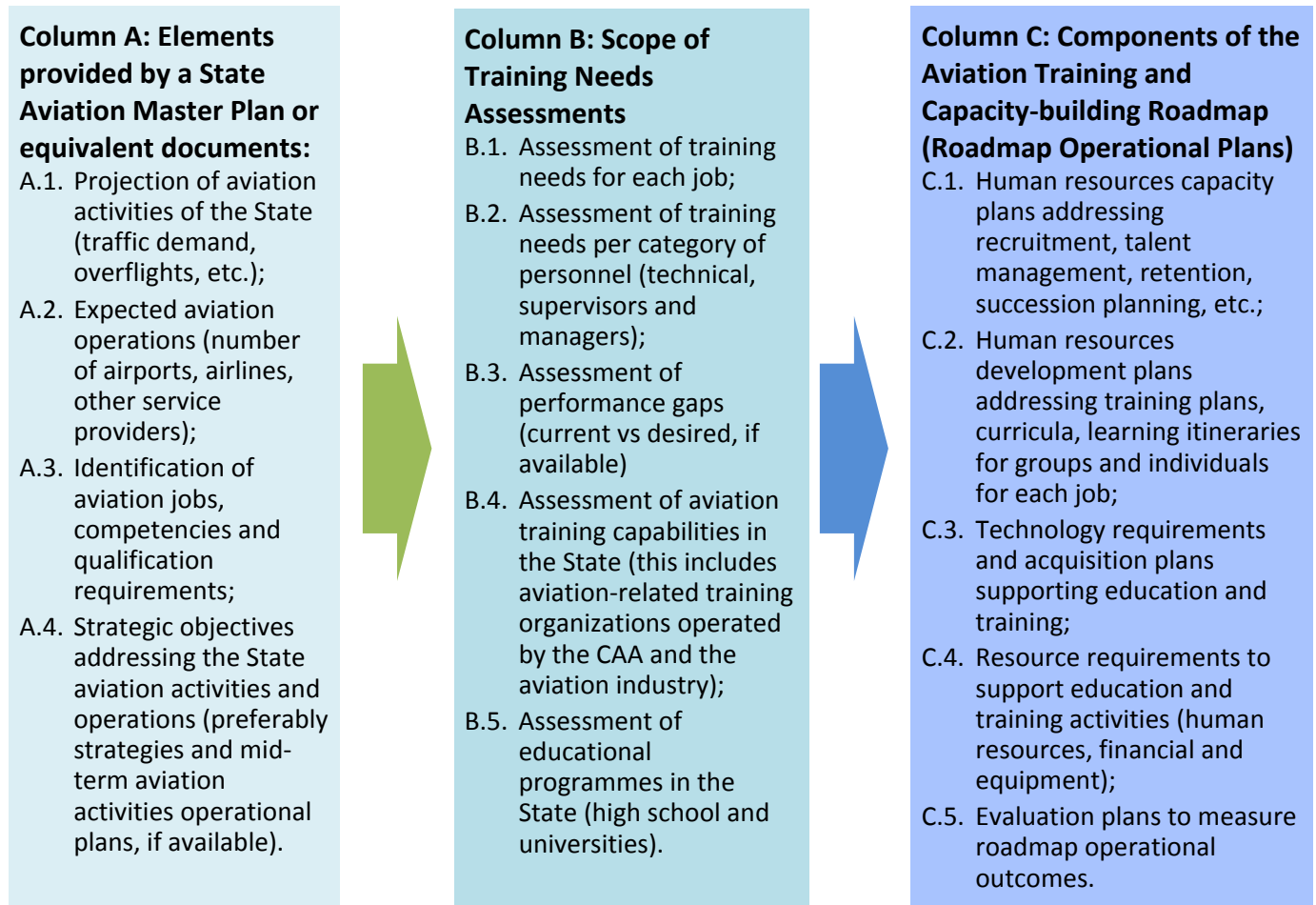


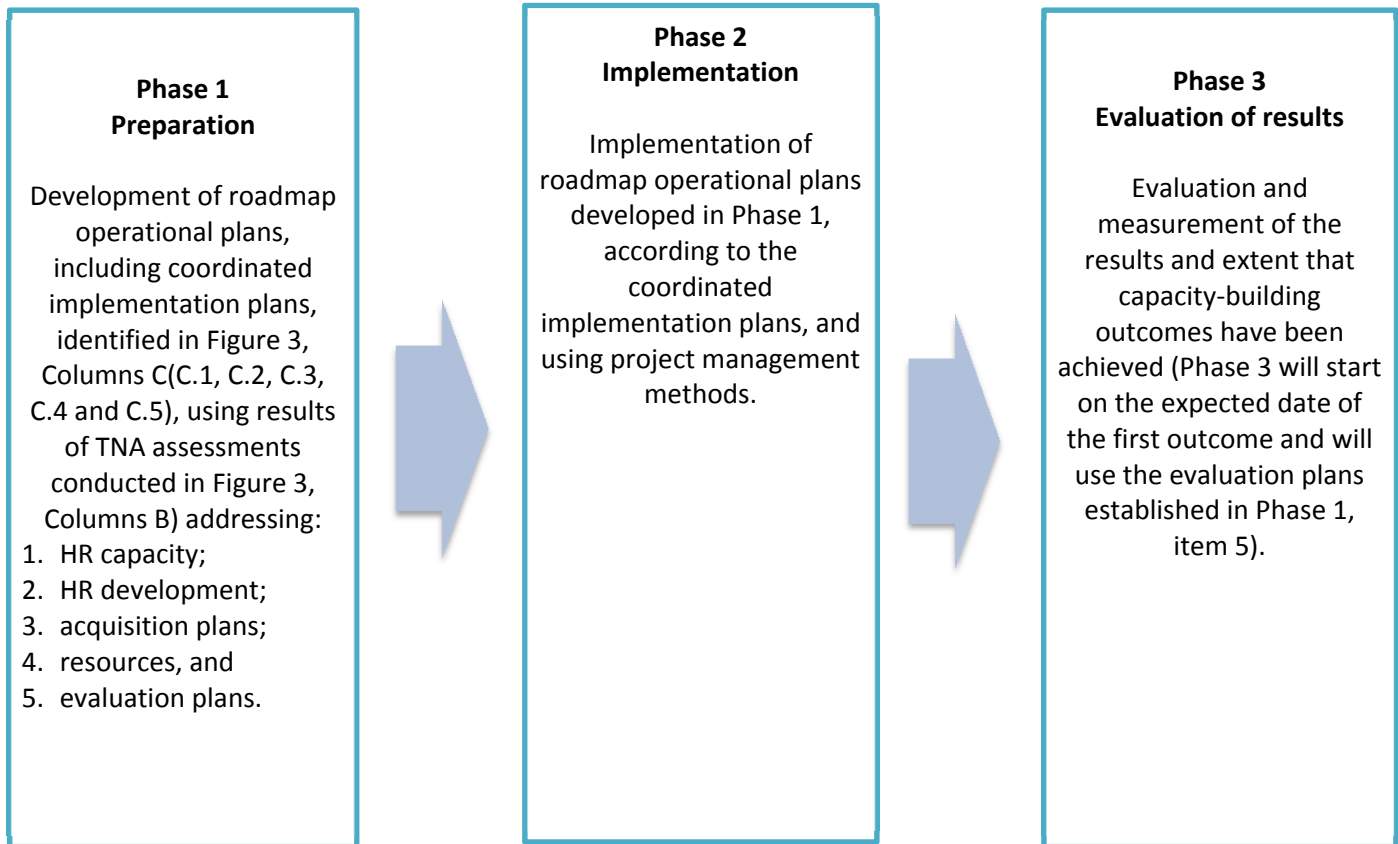
Figure 3 – General Approach

## 4. Proposed phased-approach for the development of a training and capacity-building roadmap

### 4.1. Description of the phased-approach

- a) Figure 4 presents the 3-phased approach for developing the roadmap. Sections 4, 5, 6 and 7 of this document contain a description for the three phases, Preparation, Implementation, and Evaluation of the results (outcomes) of an aviation training and capacity-building roadmap. The Preparation Phase is the most crucial as it consists of designing and developing roadmap operational plans that will be used in the Implementation and Evaluation Phases. The roadmap operational plans (Figure 3, Column C,) and their coordinated implementation plans should integrate the results of the training needs assessments (outputs from Figure 3, Column B) and organized in order to deliver the expected outcomes defined in the roadmap operational plans. The Implementation Phase is the longest and requires intense coordination and focus to ensure appropriate and timely implementation of the roadmap operational plans. The Evaluation Phase

reveals the results of the implementation and whether training and capacity-building outcomes have been met.



**Figure 4 – 3-Phased Approach**

Each of the three phases include objectives, inputs and outcomes, as described in the following sections.

## 5. Phase 1: Preparation

### 5.1 Objectives, inputs and outcomes of the Preparation Phase

- a) The main objective of the Preparation Phase is the development of roadmap operational plans and coordinated implementation plans, based on the State Master Plan or equivalent documents and results of the various assessments conducted in the TNAs processes, addressing:
  - human resources capacity (how many staff members are needed for each job and each category, required recruitment policies, including attractive talents management and retention programmes, etc.);
  - human resources development (training requirements and curricula, qualifications, training plans, learning itineraries); and
  - human resources planning, including succession planning.
- b) The State Aviation Master Plan information, and results of the TNAs will serve as data inputs to the roadmap operational and coordinated implementation plans, operational criteria and key

performance indicators (KPIs) to be achieved. The evaluation plans for measuring the outcomes of the roadmap Implementation (Phase 2) are also defined in the Preparation Phase (Phase 1, item 5). The evaluation plans identify what data will be collected, using which methods, at what intervals and how it will be used for the purpose of the evaluation (progress report, decision-making process, etc.).

- c) Finally, the outcomes of the Preparation Phase are the *ready-to-implement* roadmap operational plans, as indicated below in the Figure 5, Outcomes column.

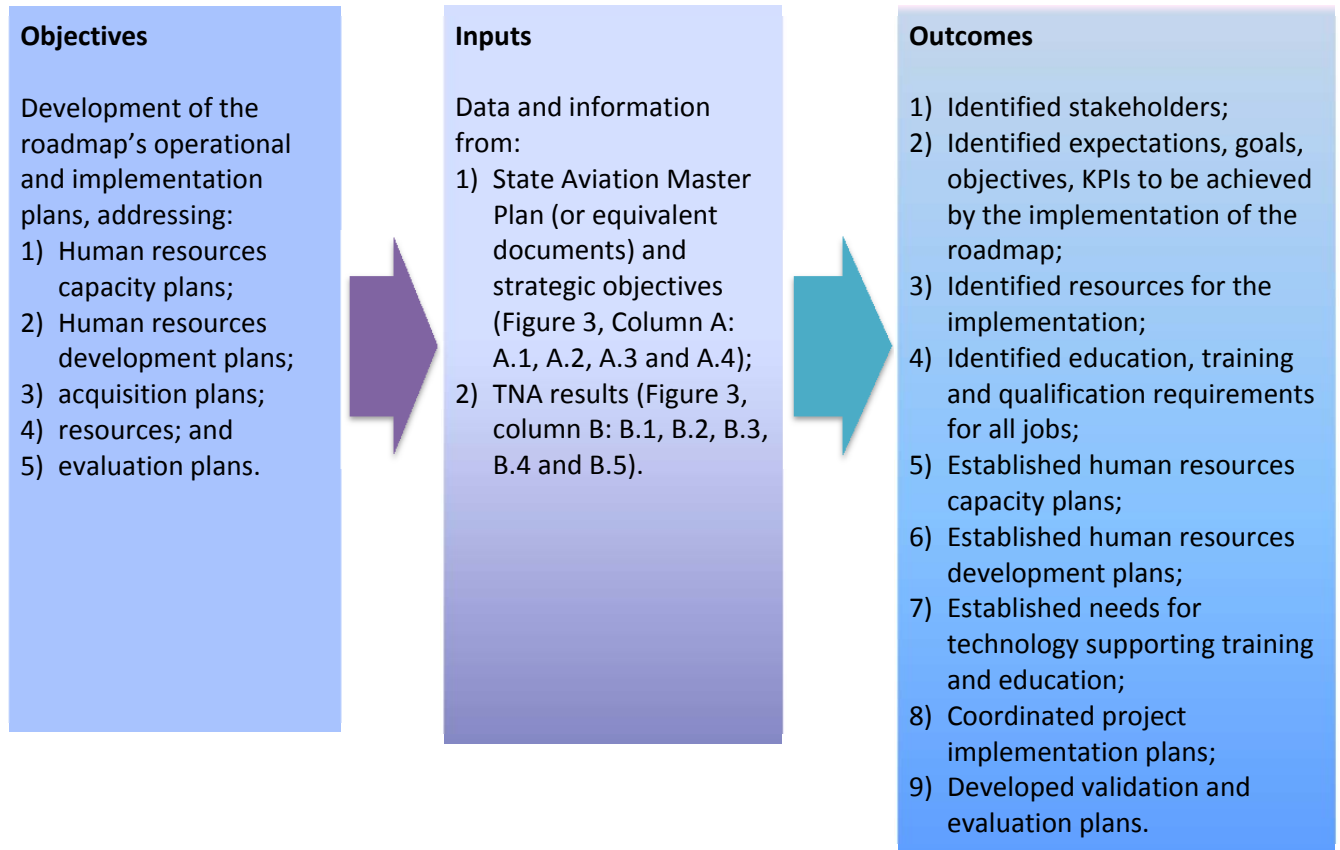


Figure 5 – Preparation Phase

## 6. Phase 2: Implementation of the roadmap

### 6.1 Objectives and outcomes of the Implementation phase

- a) The objectives of the Implementation Phase are the realization of the roadmap operational plans and implementation plans developed in Phase 1. The Implementation Phase requires strong coordination between teams working in different locations on interconnected programmes and it involves selecting adequate project management methods to ensure all activities are planned, coordinated, executed and monitored to reach desired outcomes. The project management method should include a communication plan to inform and engage all the relevant stakeholders. A change management plan is highly desirable to ensure full understanding of the roadmap initiatives by all stakeholders, a smooth transition along the Implementation Phase and mitigation of resistance to new operations. Figure 6 indicates the Objectives, Inputs and Outcomes of the Implementation Phase.

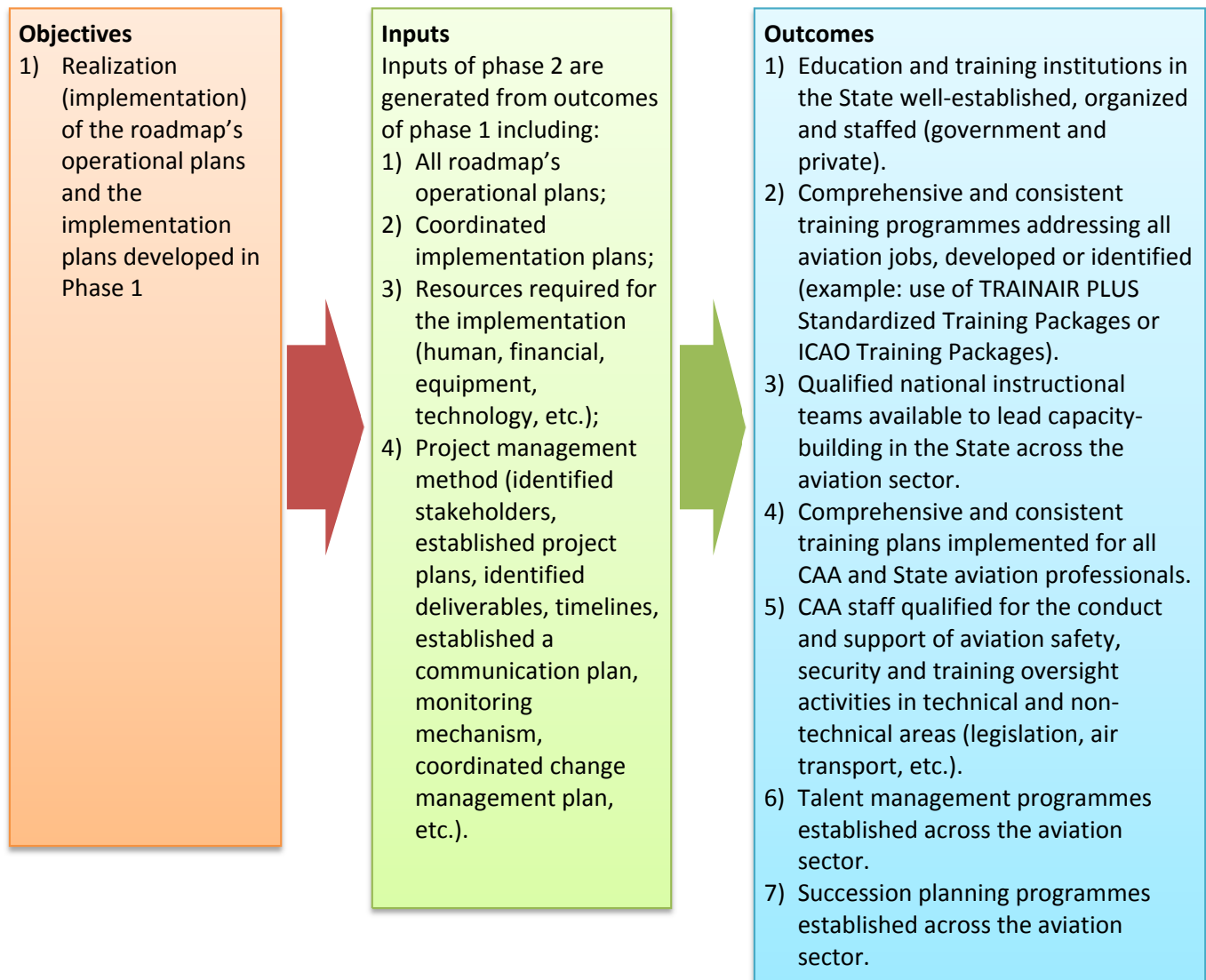


Figure 6 – Implementation Phase

## 7. Phase 3: Evaluation of the roadmap

### 7.1. Objectives and outcomes of the Evaluation Phase

- a) The objectives of the Evaluation Phase are to validate the results achieved through the Implementation Phase and ensure the implemented roadmap operational plans are achieving the desired results; in other words, to ensure goals, objectives, deliverables, milestones, and outcomes have been achieved. It is important to consider the evaluation of implemented roadmap operational plans taking place at short-, mid- and long-term intervals in order to collect data showing their successful implementation (short-term) and achieving their desired outcomes (mid- and long-term). There should be several evaluations conducted to account for the different activities and achievements during the implementation of the roadmap operational plans. These evaluations may serve to confirm successful termination of an outcome or a milestone. Individual and comprehensive reports should be produced to guide further operations or decisions.
- b) There are two categories of evaluation data: quantitative and qualitative. Quantitative evaluations provide statistical results, such as the number of training programmes delivered, the number of training courses developed, the number of trainees trained. Qualitative evaluations require an analytical approach and are more appropriate to reveal whether the implementation of operational plans was successful in relation to the State strategic objectives; for example, whether the level of occupancy is satisfactory and meeting the State's capacity needs, considering the number of qualified professionals available after the implementation of training plans.
- c) Data collection relies on several methods: gathering training statistics, interviews with stakeholders (trainees, supervisors, managers) and surveys to stakeholders, including customers. Figure 7 indicates the Objectives, Inputs and Outcomes of the Evaluation Phase.

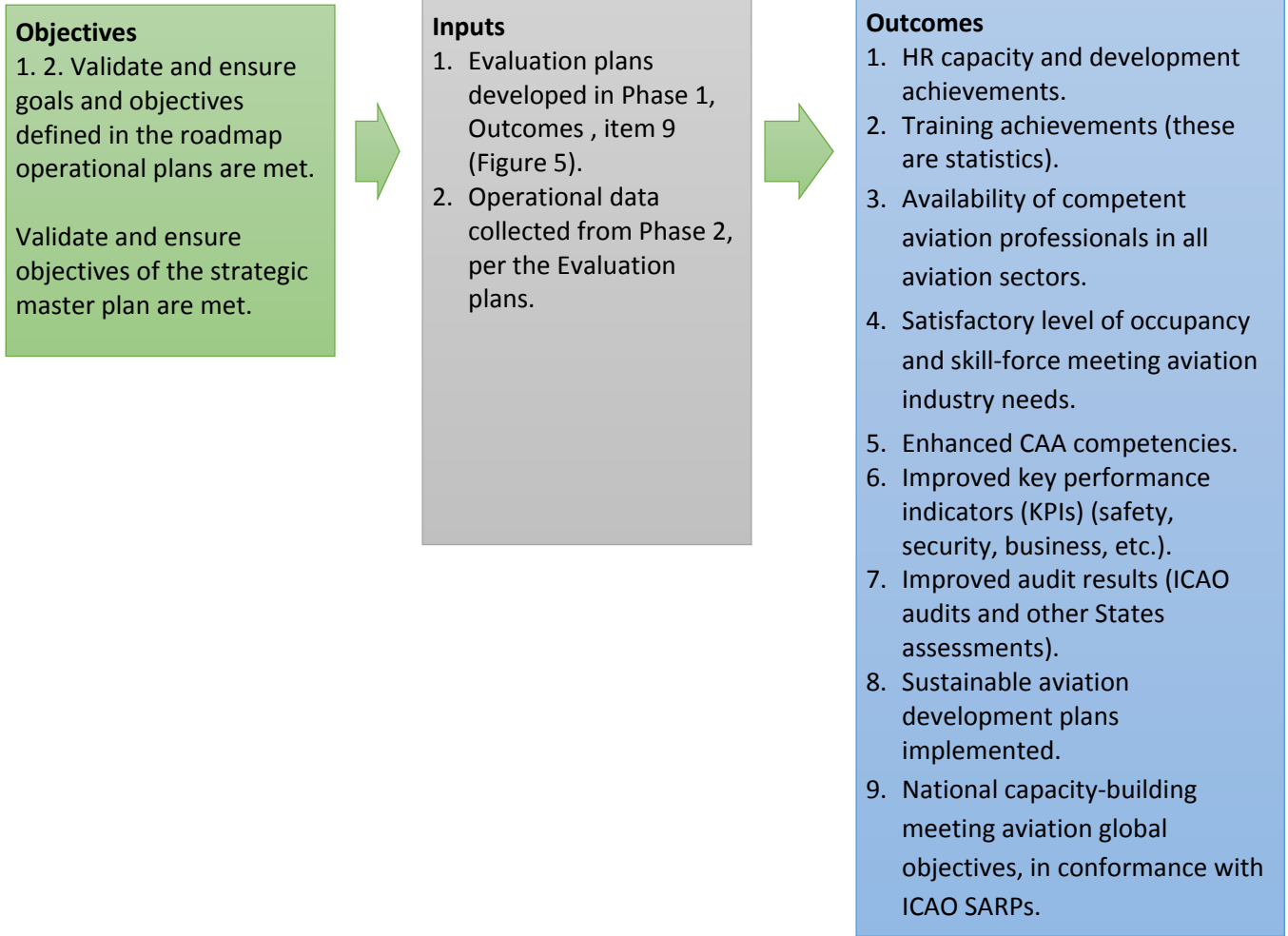


Figure 7 – Evaluation Phase



## 9. Conclusion

- a) This document provides an explanation and guidance to States for preparing, developing, implementing and evaluating a training and capacity-building roadmap for their civil aviation activities. Creating and implementing a training and capacity-building roadmap is a large undertaking, which requires data and information from two prior initiatives, the State Aviation Master Plan (or equivalent documents) and comprehensive TNAs. The success of implementing a training and capacity-building roadmap is dependent upon the quality of information and data received from these initiatives and the implementation of coordinated efforts (roadmap coordinated implementation plans), using project management methods, which include communication and change management plans. The ability for States to build capacity and meet goals will greatly improve when their training and capacity-building roadmap is established and followed.
  
- b) Appendix B shows an illustration of the high-level steps, presented in this document, to follow for the development of an aviation training and capacity-building roadmap. Appendix C presents an example of how these steps have been used for a hypothetical State: “Aviationland” for the preparation of a training and capacity-building roadmap.

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## Appendix A: Definition of Terms and Concepts

### 1. Capacity-building

The term “capacity-building” has been used throughout the United Nations (UN) system since early 1990s. All UN specialized agencies were requested to actively support capacity-building in the areas for which they were technically qualified. The United Nations Development Programme (UNDP) defines the term capacity-building as “the creation of an enabling environment with appropriate policy and legal frameworks, institutional development, including community participation, human resources development and strengthening of managerial systems”. UNDP is the lead agency within the UN system for action and thinking on capacity-building and capacity development. UNDP recognizes that capacity-building is a long-term continuing process, in which all stakeholders participate (ministries, local authorities, non-governmental organizations, professional associations, academics and others).

### 2. Capacity-building roadmap

A series of operational plans derived from the State Aviation Master Plan and training needs assessment providing step-by-step actions for short-, mid-, and long-term human resources capacity and development initiatives that will achieve capacity-building goals.

### 3. Aviation industry

The term “aviation industry” generally represents operational and commercial entities/organizations certified/approved by civil aviation authorities or other government agencies, such as airlines, aerodrome operators, air navigation service providers, training organizations, cargo operators, etc.

### 4. Human resources planning

The process that links the human resource needs of an organization to its strategic plan to ensure staffing is sufficient, qualified, and competent enough to achieve the organization's objectives. Human resources planning is a vital organizational element for maintaining a competitive advantage and reducing employee turnover.

### 5. Human resources development

Human resources development is a process of developing expertise for the purpose of improving organizational systems, work processes, team and individual performance.

### 6. Operational objectives

Operational objectives are targets whose attainment moves an organization toward achieving its strategic or long-term outcomes. In practice, operational objectives are used as mid-term milestones (or achievements) for long-term projects.

### 7. Training needs assessment

A training needs assessment is the process of identifying the areas where employees in an organization would benefit from training in order to become more effective in performing their jobs and meeting the objectives of the organization.

## 8. Talent management

Talent management refers to an organization's attempts to recruit, keep, and train the most gifted and highly qualified staff members that they can find, afford and hire. Talent management gives business managers an especially important role to play in recruiting, developing and retaining desirable staff members.

## 9. State Aviation Master Plan

One or more strategic documents that include the fundamental information about aviation in the State upon which the Roadmap will be developed, such as:

- a) a list of existing aviation activities carried out in the State;
- b) a list of planned activities in short-term;
- c) a list of planned activities in mid-/long-term (up to 10 years, if possible);
- d) existing aviation infrastructure;
- e) existing aviation service providers;
- f) planned changes in aviation infrastructure;
- g) planned changes in the aviation market;
- h) the institutional system of the State;
- i) expected changes affecting the institutional system of the State;
- j) State's aviation strategies;
- k) State's aviation development plans; and
- l) State's performance targets (safety, security, environment, state's objectives, etc.).

## 10. Succession planning

Succession planning refers to the identification and development of potential successors for key positions in an organization, through a systematic evaluation and development process, including training.

## 11. Stakeholders

Stakeholders are all those involved or impacted by the plans and initiatives defined in the Roadmap. Following is a suggested list of stakeholders for an aviation training and capacity-building roadmap:

- a) State
- b) agencies (civil aviation authorities and other government agencies);
- c) service providers (airline, airports, air navigation services, training institutions, ground handling agencies, etc.);
- d) educational institutions;
- e) ICAO;
- f) regional organizations to which the State is party;
- g) other international organizations (International Air Transport Association, Airports Council International, Civil Air Navigation Services Organisation, etc.);
- h) other selected UN agencies supporting the State's capacity-building (UNDP, United Nations Educational Scientific and Cultural Organization, World Bank, etc.);
- i) professional national organizations (e.g. pilots' or air traffic controllers' associations);

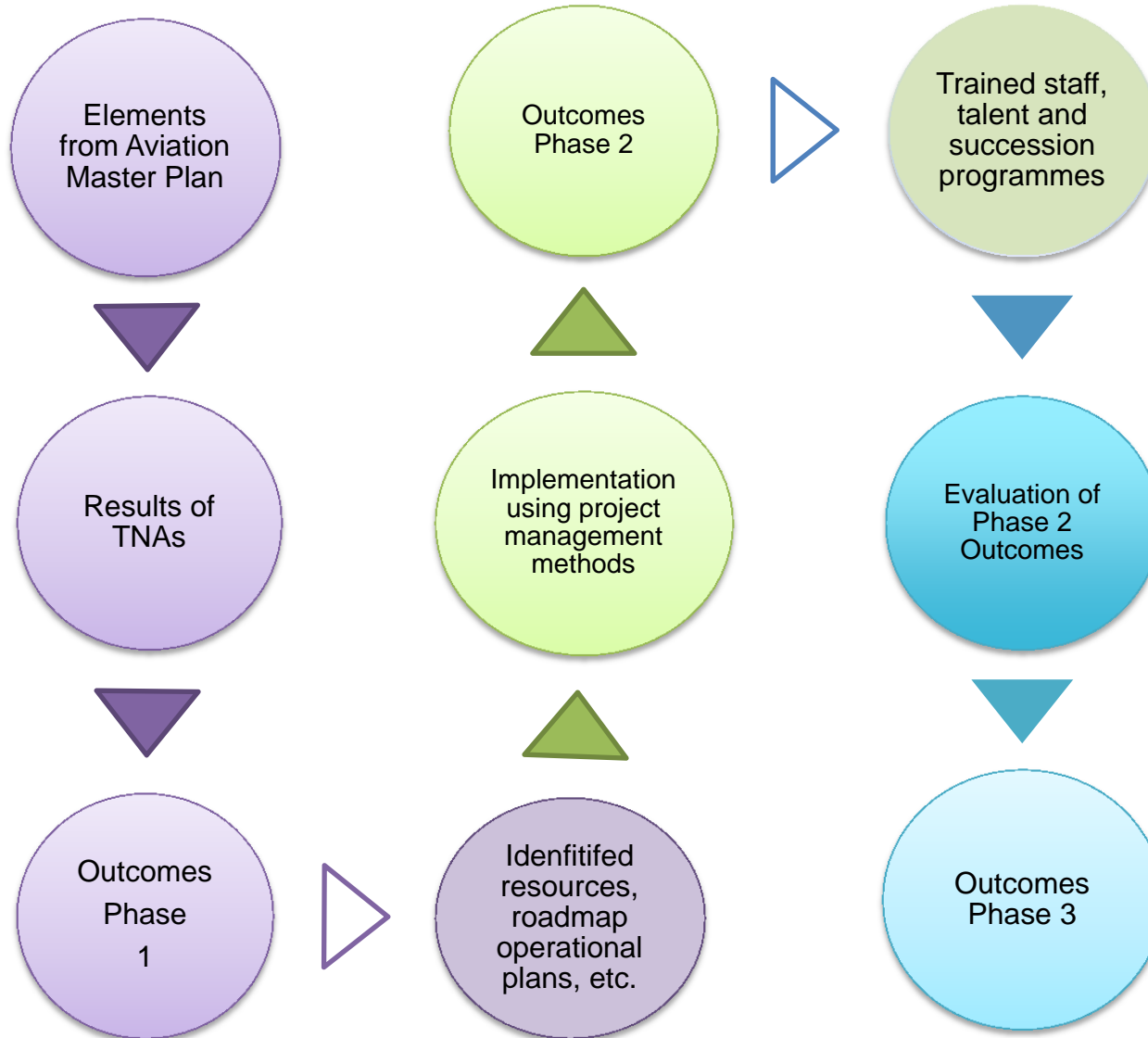


- j) regional training associations/organizations; and
- k) manufacturers.

## 12. Training plans

The training plans are documented evidence that identify human performance improvement needs within an organization (or a division/department) that can be addressed through training and development, including how to address them. They identify specific jobs within an organization for which training is required, prioritize training needs, and confirm which training strategies best allow achieving desired performance outcomes. They identify the human, financial and material resources required for training and plans for their optimal use.

### Appendix B: Overall Presentation of the Roadmap Process





## Appendix C: Outline of Aviationland Training and Capacity-Building Roadmap

This Appendix outlines how a fictitious State (Aviationland) will follow the phased approach for the development and implementation of an Aviation Training and Capacity-building Roadmap. Information herein is only an illustration of the type of data and actions States or organizations need to consider during the development of their Roadmap.

### **Phase 1 Preparation: Development of roadmap operational plans and coordinated implementation plans**

Aviationland has just completed the development of an aviation master plan called “Aviation Horizon 2035” and is now planning to establish an Aviation Training and Capacity-building Roadmap to ensure they have adequate human resources and competencies to support the development of the aviation sector for the upcoming fifteen years (2017-2032).

#### **A - Elements from the master plan (numbering refers to Figure 3, Column A):**

A.1. Projection of aviation activities of the State (traffic demand, overflights, etc.):

- a) Aviationland tourism is growing and they anticipate attracting 40 million tourists by 2035, which, in addition to the business travellers and nationals, should bring national airports and airspace to handle 70 million passengers by 2035 (this is three times the current capacity of airports and airspace);
- b) Aviation Horizon 2035 also includes a complete set of data and projection of traffic demand by category of passengers, overflight traffic, international and domestic expected demand for each airport, including national and foreign operators.

A.2. Expected aviation operations (number of airports, airlines, other service providers):

- a) Aviationland currently has:
  - 1 Air Navigation Service Provider (ANSP);
  - 10 international airports;
  - 10 domestic airports;
  - 5 military airports that can be used in case of emergency or diversion by civil aircraft, including commercial;
  - 3 airlines offering international connections; and
  - ground handling activities carried out by private companies.

A.3. Identification of aviation jobs, competencies and qualification requirements:

- a) As part of the Aviation Horizon 2035, Aviationland has conducted a comprehensive review of its needs in terms of jobs related to support its planning activities and ensure compliance with ICAO SARPs. There are currently more than 150 identified jobs relating to the aviation sector. Some of them are licensed, in accordance to ICAO Annex 1 — *Personnel Licensing* to the Chicago Convention and State regulations (pilots,

air traffic controllers (ATCO)), several are licensed based on CAA requirements only (e.g. air traffic safety electronics personnel, all aviation security-related jobs, cabin crew, dangerous goods acceptance staff) and other jobs are only regulated in terms of qualifications.

- b) State Safety Programme requires all companies operating in the aviation sector to ensure implementation of a Safety Management System and identify training requirements for their staff, in compliance with State regulations and their responsibilities.
- c) Table 1 below shows the current and expected level of occupancy for pilots, ATCOs and some Aviation Safety Inspectors (ASI) jobs. The information is available for other jobs, but not for all. The State uses a planning system by triennium which explains, why most information has been established on a triennial basis.

	Available Q1 2017	Needs 2017	2020	2023	2026	2029	2032
<b>Captains</b>	300	320	362	409	462	522	590
<b>First Officers</b>	260	280	316	358	404	457	516
<b>ASI-PEL</b>	4	6	7	8	9	10	11
<b>ASI-OPS</b>	5	10	11	13	14	16	18
<b>ASI-AIR</b>	7	10	11	13	14	16	18
<b>ASI-AGA</b>	4	10	11	13	14	16	18

**Table 1**

- d) Table 2 below indicates the yearly expected retirement movements for pilots and ASIs, but it does not consider the expected staff to be recruited (information not available because the recruitment analysis has yet to take place).

	2017	2018	2020	2023	2026	2029	2032
<b>Capt.</b>	45	60	68	77	87	98	111
<b>ASI-PEL</b>	1	1	2				
<b>ASI-OPS</b>	2	2	1	1			
<b>ASI-AIR</b>	2	3	2				
<b>ASI-AGA</b>	1	1	2				

**Table 2**



A.4. Strategic objectives addressing the State aviation activities and operations (preferably strategies and mid-term aviation activities operational plans, if available):

- a) Aviationland has identified a set of strategic objectives and supporting strategies for the implementation of the Aviation Horizon 2015, addressing safety, security, environment, capacity and quality of service. All government and private agencies, companies and firms operating in air transport are required to implement and demonstrate compliance with State's strategic and operational plans and, in particular, to ensure operational and management tasks are carried out only by qualified and competent personnel.

**B - Elements from the Training Needs Assessments (numbering refers to Figure 3, Column B):**

B.1. Assessment of training needs for each job:

- a) Training needs have been conducted only for licenced jobs, ASIs for personnel licensing; aircraft operation, airworthiness and airports inspectors and some job critical for the State's strategic objectives.

B.2. Assessment of training needs per category of personnel (technical, supervisors and managers):

- a) A comprehensive training needs assessment to address the training requirements in relation to work responsibilities has been conducted. A government order requires all agencies and companies to implement a roles and responsibilities matrix for all positions, including managers, indicating their level of accountability for domains and areas related to their functions. In addition to technical training related to proficiency, all employees and managers are required to complete recommended soft skills training.

B.3. Assessment of performance gaps (current vs desired, if available):

- a) The assessment of performance gaps for the current situation of Aviationland has been conducted by the following national and international programmes:

- ICAO Universal Safety Oversight Audit Programme (USOAP)
- ICAO Universal Security Audit Programme (USAP)
- ICAO machine readable travel document (MRTD)
- EUROCONTROL for Aviationland air navigation services provider (ANSP)
- European Aviation Safety Agency (EASA) for airlines
- CAA audits for all aviation industry
- National audit team for all government agencies addressing human resources

b) Table 3 below reveals the assessment of performance gaps for the current situation:

Area	Level of Compliance	Notes
Compliance of State Regulations with ICAO SARPs	70%	Low level of compliance due to long process for implementation of SARPs in State’s regulations
Average Effective Implementation for USOAP	65%	Low level of Effective Implementation due to lack of inspectors to conduct safety oversight certification and surveillance.
Average Effective Implementation for USAP	70%	Low level of Effective Implementation due to lack of inspectors to conduct security oversight.
ANSP compliance with EUROCONTROL	92%	
Average compliance with Airline X	95%	
Average compliance with Airline Y	90%	
Average compliance with Airline Z	85%	
ANSP compliance with State’s requirements	95%	
National Audits addressing Human Resources	75%	Main recommendations are related to the lack of implementation of requirements regarding human resources management, training and planning.

**Table 3**

c) The staffing needs, the potential increase of the gap between available and required competencies, and the results of national audits of human resources revealed a need for urgent development and implementation of operational plans to avoid a shortage of competencies in aviation skills.

B.4. Assessment of aviation training capabilities in the State (this includes aviation-related training organizations operated by CAA and the aviation industry).



a) Table 4 below indicates training institutions (public and private):

Training Institutions	Training Programmes
National Pilots School	PPL, CPL, IR, Single and Bi, Helicopter and Fix-wings
Airline A	Type Ratings for all type of aircraft registered in Aviationland Dangerous Good courses, all specialties Cabin Crew Training
ANSP Academy	Training programmes for all jobs related to air navigation and airport services
Airline B	Dangerous Good for acceptance staff and managers Cabin Crew
Other	Several approved schools for cabin crew training

**Table 4**

B.5. Assessment of educational programmes in the State (high school and universities):

a) Aviationland has a vast network of universities, engineers’ schools and undergraduate level public and private institutions delivering education in many areas directly or indirectly related to aviation. Only large universities and engineers’ schools have been assessed for the time being.

B.6 For the completion of Phase One, Aviationland will use inputs from the State Aviation Master Plan and the Training Needs Assessments and establish a list of activities they want to accomplish. The State has a fast-growing aviation activity, high potential of skills shortage for pilots and ASIs, but it could be the same for other jobs. The State also has weak CAA capacity, and training activities need to be enhanced. The following is an example showing a list of activities based on collected information:

- a) identification of stakeholders concerned with the scope of the roadmap (CAA, airlines, ANSP, universities, training centres, etc.);
- b) identification of expectations, goals, objectives, KPIs to be achieved by the implementation of the roadmap (these are related to corrective actions to be taken based on gap analysis (Figure 3, Column B.3) and problems identified from USOAP, USAP, etc.);
- c) identification of resources for the implementation;
- d) identification of education, training and qualification requirements for ASIs (this is done for pilots);
- e) establishment of human resources capacity plans (complete and validate the table with needs identified under A.3, Table 1);
- f) recruitment of additional inspectors for 2017;



- g) establishment of human resources development plans (training for First Officers to become pilots, and training and qualification of additional ASIs, including their managers);
- h) establishment of a development plan for pilots' training ensuring two hundred pilots per year by 2030 (need for the development of airlines and compensation for retirement)
- i) establishment of needs for technology supporting training and education;
- j) establishment of missing qualification programmes for inspectors
- k) enhancement of training capacity
- l) coordination of project implementation plans (activities needs to be put in a matrix with timelines, priorities, resource needs and assignment in order to be used as project implementation plans); and
- m) development of validation and evaluation plans (select the objectives and timelines and build the evaluation plan).

B.7 Aviationland will therefore be able to establish its roadmap operational plans for the following (the numbering reflects Figure 3, Column C):

- a) human resources capacity plans addressing recruitment, talent management, retention, succession planning, for pilots, ASIs, and other jobs once the TNAs are completed;
- b) human resources development plans addressing training plans, curricula, learning itineraries for pilots, ASIs, and other jobs once the TNAs are completed;
- c) technology requirements and acquisition plans supporting education and training of pilots, ASIs, and other jobs once the TNAs are completed;
- d) resource requirements to support education and training activities for pilots and other jobs once the TNAs are completed; and
- e) evaluation plans to measure shortage of pilots, if USOAP and USAP results have been improved, etc.

### **Next steps**

Once the roadmap operational plans and coordinated implementation plans are developed, the next step is to identify an implementation team and conduct the Implementation Phase (Phase 2). Progressively evaluate the results, according to the Evaluation Plan defined in Phase 1, and executed as Phase 3.

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