INTERNATIONAL CIVIL AVIATION ORGANISATION
WESTERN AND CENTRAL AFRICAN OFFICE

23RD AFI SATELLITE NETWORK MANAGEMENT COMMITEE MEETING

Accra, Ghana 15 to 19 February 2016

Agenda item xx: ICAO improvements on the PANS-Training Doc and the ICAO ATSEP Training Manual

Presented by:
IFATSEA REGION AFRICA DIRECTOR

International Federation of Air Traffic Safety Electronics Associations

ICAO improvements on the PANS-Training Doc and the ICAO ATSEP Training Manual

by

Ing Frank Kofi Apeagyei

IFATSEA Region Africa Director

Content

- About IFATSEA
- ICAO NGAP
- ICAO PANS-TRG
- ICAO ATSEP Training Manual

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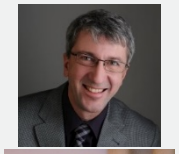
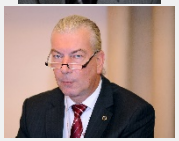
President	Daniel Boulet *Canada*	
Executive Secretary	Thorsten Wehe Germany	
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- ATSEP Licence
- Future ATM Systems
- ICAO
- Safety
- Training

The Air Transportation System and several key subsystems
including the Aircraft,
Airline, and
Air Traffic Management
are modeled as
interacting control loops.

The impact of Technologies
on each of these subsystems is evaluated through the performance of these control loops.
At a greater scale,
loops are interacting with each others.

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Technologies are seen to have a significant impact on the safety, efficiency, capability, capacity, environmental impact and financial performance of the Air Transportation System.

Air Traffic Safety Electronic Personnel (ATSEP)

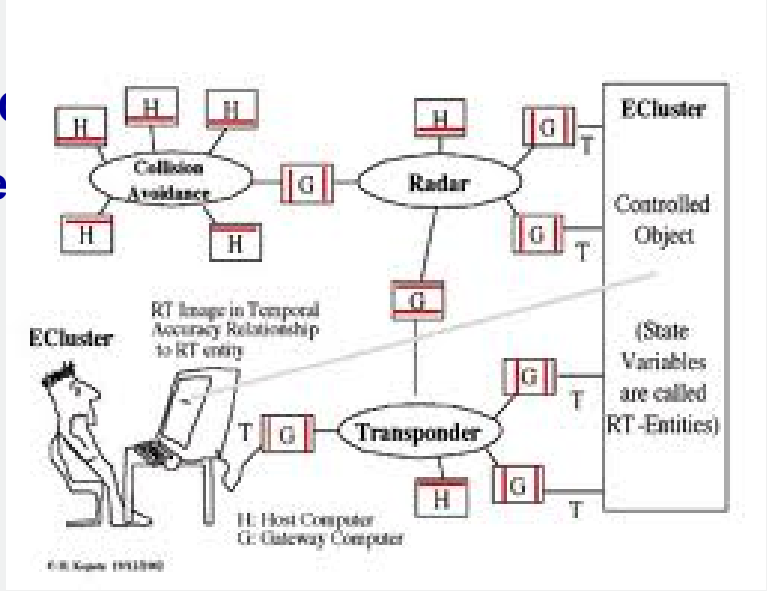
- The shortage of highly qualified electronic professionals experts (ATSEP) in the forthcoming new automation era will soon become evident.

- Inevitably, the responsibility for the ATSEP will grow. More coverage, more networks (SWIM), more data communications (less verbal communication), more decision made by computers etc.

- The fruitful operations will rely more and more on the skills and competencies of ATSEPs. Logically, you want the elite to face the future.

Air Traffic Safety Electronic Personnel (ATSEP)

- The standards for ATSEP to be implemented by ICA(should be according to the highest one among the involved countries on the globe.



The cooperation, the sharing of technological expertise and procedures is also greatly encouraged by IFATSEA.

Our Objectives

- We seek to continuously improve and increase safety and performance in aviation

- As technicians and engineers, we like when the system works. And we strongly believe that it is the time to set global standards for the benefit of all.

- We would like to see more consideration on:

  Safety Culture, Human Factors, Just Culture, Human Performance.

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Procedural Based Control:

Control on Where We Think the Aircraft Is

History

Landmark Navigation
Radio Beacons
Position Reports

Surveillance Based Control:

Control on Where We Know the Aircraft Is

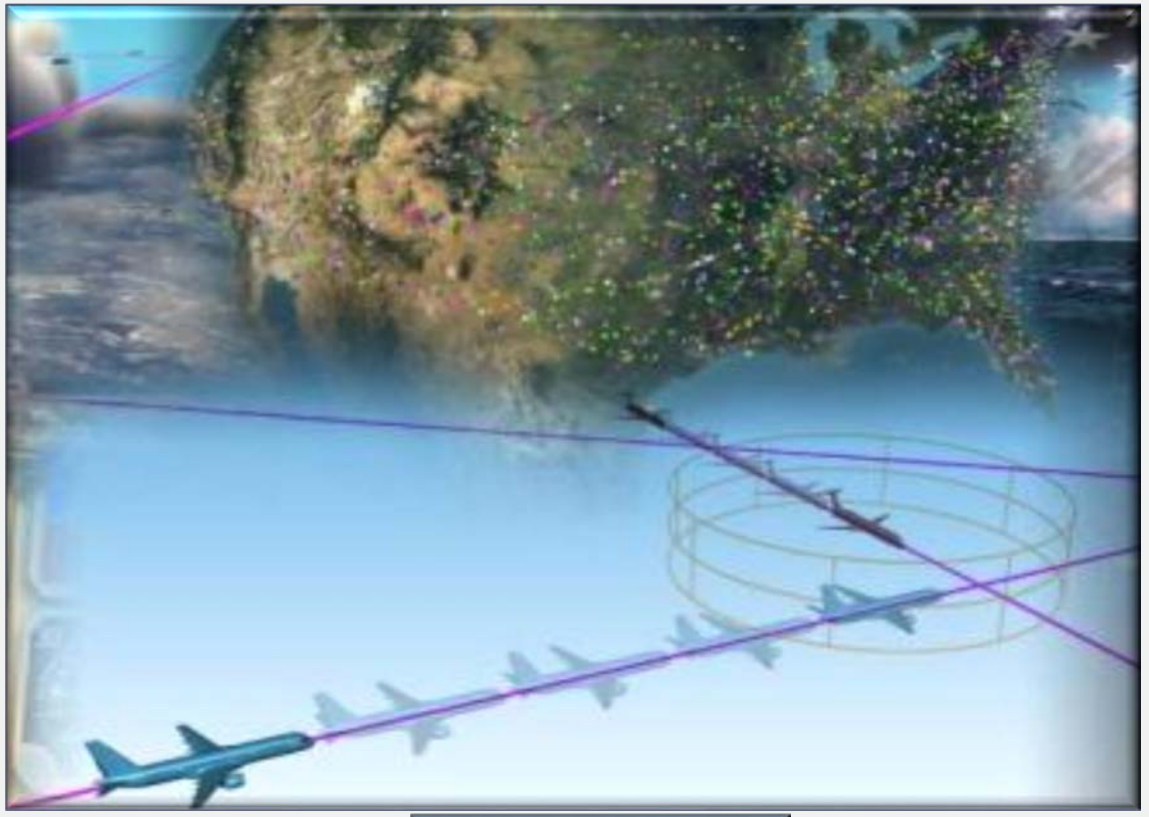
Today

VOR/DME
RADAR

Trajectory Based Control:

Control on Where We Know the Aircraft Will Be

Future



PBN
ADS-B
DataComm

Future

- Investments in the future ATM Systems is imperative
- Change Management
- Cooperation of ANSPs is a key for the long term future
- ATM need stable financial resources to meet future objectives and to survive in crucial situations
- sustainable traffic forecast is essential

Safety First

- **IFATSEA strongly opposes any policies that place profit over the cost of Safety or competency levels, including training costs or Licensing, or the well being of its members.**

- **Competition must not be allowed to compromise safety.**

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- liability and responsibility of ATSEP must be clearly defined today and in future ATM Systems
- Competence Scheme, Training and Re-Training for ATSEP is an essential key to improve safety
- IFATSEA is in favour of and encourage a global ATSEP Licence Scheme

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NGAP – Next Generation of Aviation Professionals

It has been recognized by the international aviation community that there will be an anticipated shortage of skilled aviation professionals in the near future. In order to address this important issue, ICAO launched the Next Generation of Aviation Professionals (NGAP) initiative to ensure that enough qualified and competent aviation professionals are available to operate, manage and maintain the future international air transport system.

1st Next Generation of Aviation Professionals Symposium which took place at ICAO Headquarters in
Montreal, Canada, from 1 to 4 March 2010

Background

Next Generation of Aviation Professionals (NGAP) issues are of immediate interest to many stakeholders: airlines, air navigation service providers, airports, manufacturers, training providers, universities, and others. Attracting and educating the next generation of aviation professionals also involves working with national and international education and labor stakeholders. In order to promote and gain leverage for NGAP among all stakeholders, it is critical to adopt a data-driven approach that justifies the future investment of resources in NGAP initiatives.

The NGAP Task force is a consortium of stakeholder organizations who have identified specific NGAP issues that should be addressed and who are willing to commit resources to support NGAP initiatives. ICAO initially launched the NGAP programme in 2009 to address the forecasted shortage of aviation professionals.

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NGAP Vision

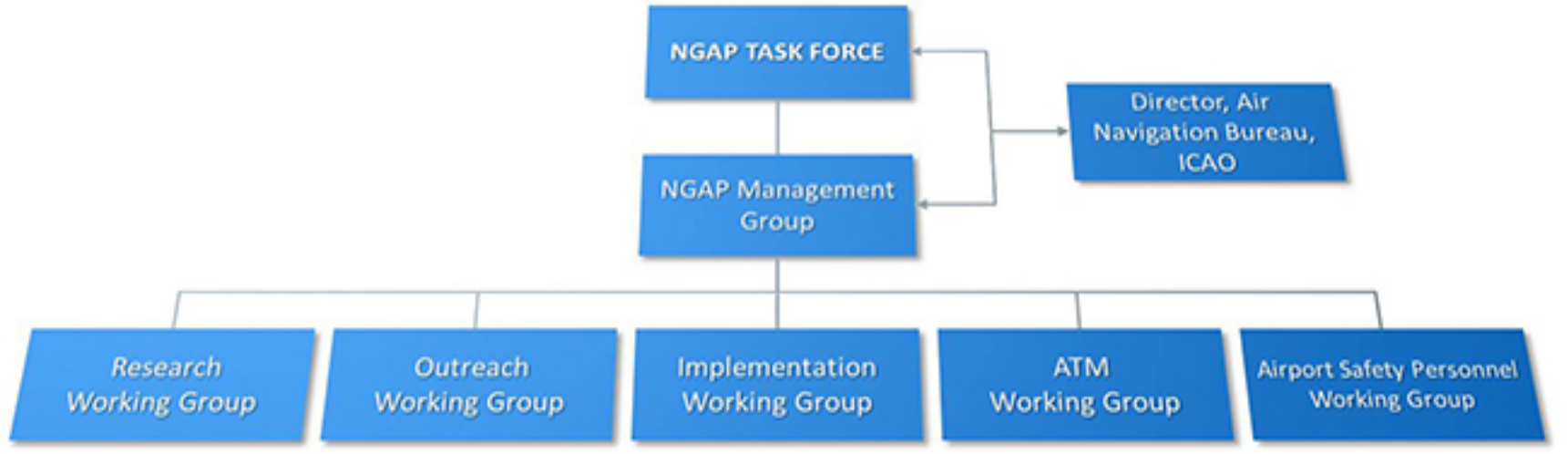
A global aviation community that has sufficient competent human resources to support a safe, secure and sustainable air transportation system.

NGAP Mission

To develop strategies, best practices, tools, standards and guidelines as applicable and to facilitate information sharing activities that assist the global aviation community in attracting, training, educating, and retaining the next generation of aviation professionals.

Specific objectives for the Working and Sub-Groups were also developed and approved by the Task Force.

Organizational Structure



ICAO NGAP Task Force Working Groups Objective

To develop tools and provisions for ICAO Contracting States and the international civil aviation community that will assist them in implementing effective strategies to attract, train, educate, and retain the next generation of civil aviation professionals at global and regional levels.

Procedures for Air Navigation Services
PANS-TRG (Doc 9868)

Updates

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PANS-TRG

- ICAO Documents
- Purpose
- Major Changes
- Major Elements

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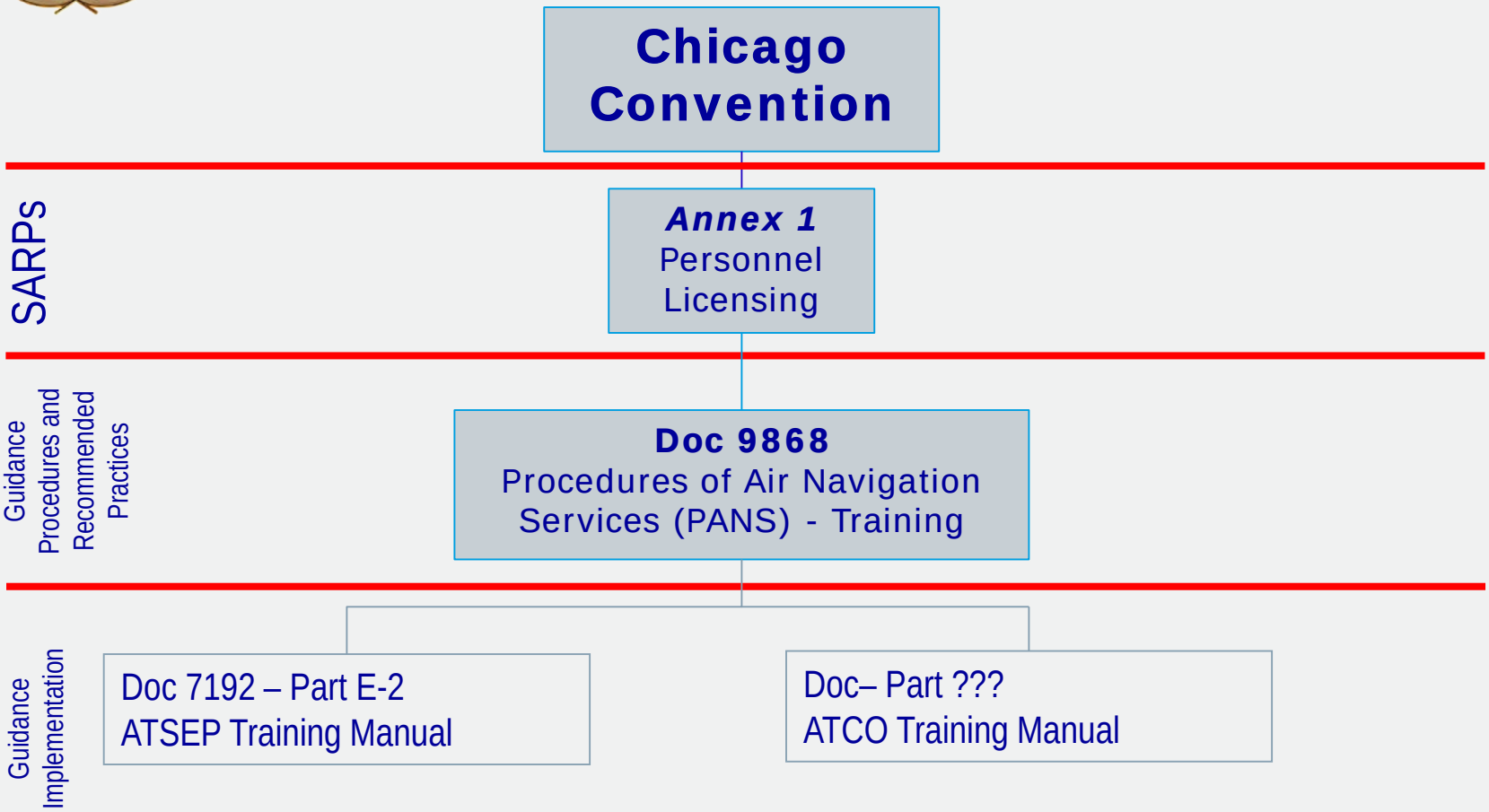
ICAO Document Hierarchy



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Purpose of PANS-TRG

- **PANS TRG is complementary to Standards and Recommended Practices (SARPs)**
- **Specifies in greater detail the actual procedures to be applied by organizations when providing training**

Restructure of PANS

- Accommodate three new chapters, one related to CNS/ATM personnel
- Competency frameworks included for ATCO and ATSEP
- Accommodate future inclusion of competency frameworks for other personnel

Guiding Principles for ATSEP Provisions

- Generic: Applicable in all contexts
- Flexible: Adaptable to all contexts
- Usable by all stakeholders

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New PANS TRG structure

Part Number	Part Title
1	General Procedures
2	Training and Assessment for Aircraft Operational Personnel
3	Training and Assessment for Aircraft Maintenance Personnel
4	Training and Assessment for Air Traffic Management Personnel
5*	*Training and Assessment for Aerodrome Personnel*
6*	*Training and Assessment for Other Aviation Personnel*

Major Changes

- **Part IV Training and Assessment for Air Traffic Management (ATM) Personnel**

Chapter 1

- Based on systematic approach
- Competencies and Performance Criteria defined
- Training based on competencies identified
- Assessment determine competency achievement

Chapter 2

- **Competency Based Training and Assessment for Air Traffic Controllers (ATCOs)**

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Chapter 3

- **Competency Based Training and Assessment for Air Traffic Safety Electronics Personnel (ATSEP)**

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Considerations for Implementing Competence Based Training

- Define Level of Competence
- Transition (Traditional to CBT)
- Continuous evaluation of program

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Competency Framework

- Standardized Performance
- Flexible
- Generic

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Competency Framework

- Competency Units
- Competency Elements
- Performance Criteria- Observable Behaviors

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Competency Units

- A discrete function consisting of a number of Competency Elements

Competency Units

- Engineering
- Situational Awareness
- Service Provision
- Coordination
- Management of non-routine situations
- Problem solving and decision making
- Self-management and continuous learning
- Workload management
- Teamwork
- Communication

Competency Elements

- An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome

Performance Criteria

- Simple, evaluative statements on the required outcome of the Competency Element and a description of the criteria used to judge whether the required level of performance has been achieved.

IFATSEA – ICAO PANS-TRG

COMPETENCY UNIT	DEFINITION	COMPETENCY ELEMENT	CE No.	PERFORMANCE CRITERIA OBSERVABLE BEHAVIOUR	PC No.
ENGINEERING	Collaborate in developing, modifying and integrating systems, networks and equipment	• Develop specifications	CE1.1	• Demonstrates technical knowledge and reasoning	PC1.1
		• Design the technical system	CE1.2	• Demonstrates ability of engineering reasoning and problem solving	PC1.2
		• Support the technical system	CE1.3	• Demonstrate the knowledge and reasoning of interoperability in terms of global systems and environments	PC1.3
		• Install CNS/ATM systems into an operational context	CE1.4	• Demonstrates ability to set system requirements	PC1.4
		• Evaluate new technologies	CE1.5	• Develops modelling of system and ensures requirements can be met	PC1.5
		• Manage system operational life cycle	CE1.6	• Manages development projects effectively	PC1.6
		• Assess system performance in the performance-based operational context	CE1.7	• Designs implementation process effectively	PC1.7
		• Manage resources required for CNS/ATM systems and capabilities	CE1.8	• Tests, verifies, validates and certifies new systems, equipment or installations	PC1.8
				• Supports system and equipment implementation	PC1.9
				• Optimizes systems and network elements	PC1.10
				• Supports system life cycle	PC1.11
				• Anticipates and organizes system and equipment decommissioning	PC1.12

COMPETENCY UNIT	DEFINITION	COMPETENCY ELEMENT	CE No.	PERFORMANCE CRITERIA OBSERVABLE BEHAVIOUR	PC No.
TEAMWORK	Operate as a team member	• Foster an atmosphere of open communication	CE9.1	• Provides feedback constructively	PC9.1
		• Encourage team participation and cooperation	CE9.2	• Shows respect and tolerance for other people	PC9.2
		• Intervene appropriately, when necessary	CE9.3	• Carries out actions and duties in a manner that supports a team environment	PC9.3
		• Use feedback to improve overall team performance	CE9.4	• Uses negotiating and problem-solving techniques to manage unavoidable conflict	PC9.4
				• Raises relevant concerns in an appropriate manner	PC9.5
				• Accepts feedback constructively	PC9.6
				• Shares experiences with the aim of continuous improvement	PC9.7
COMMUNICATION	Communicate effectively in all situations	• Select appropriate methods of communication	CE10.1	• Selects communication methods that take into account the requirements of the situation	PC10.1
		• Use effective verbal communication	CE10.2	• Speaks clearly, accurately and concisely	PC10.2
		• Use effective non-verbal communication	CE10.3	• Uses appropriate vocabulary and expressions for communications with stakeholders	PC10.3
		• Use effective written communication	CE10.4	• Demonstrates active listening by asking relevant questions and providing feedback	PC10.4
				• Verifies comprehension of counterparts and corrects as necessary	PC10.5
				• Uses eye contact, body movements and gestures that are consistent with verbal messages	PC10.6
				• Interprets non-verbal communication correctly	PC10.7

Flexible - Pick and Mix

CU – Competency Units
CE – Competency Elements
PC – Performance Criteria

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How to use overview

- Identify Activity-Job requirements
- Associate Competencies
- Associate Training Modules for Basic Qualification and Training
- Design Unit Training
- Assessment

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Recommendations for Training

- Theoretical and Practical Instruction
- Sufficient Practical Training
- Appropriate to duty
- Qualified Instruction

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Important Points

- Encourage organisations to adopt CBT
- It's a recommendation
- Flexible - Pick and Mix

NGAP – Next Generation of Aviation Professionals

ICAO DOC 7192 Part E-2 ATSEP Training Manual

In November 2013 ICAO asked the ATM Working Group to update the ICAO Doc 7192 and develop an ATCO Training Manual

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Update

ICAO DOC 7192 Part E-2 ATSEP Training Manual

5 Meetings face to face:

09 to 10 December 2013 in Johannesburg, South Africa
27 to 31 January 2014 in Toulouse, France
08 to 11 April 2014 in Oklahoma City, USA
23 to 26 June 2014 in Cornwall, Canada
14 to 16 October 2014 in Prague, Czech Republic

Representatives for IFATSEA:

Carlos Aguirre (USA), Katy Carpenter (USA), Patrick Delaney (USA), Michel Gaulin (CAN), Andreas Meyer (DEU), Pete Rosa (USA), Ryan Saw (CAN), Dave Spero (USA), Edward Szczuka (USA), Thorsten Wehe (DEU)

Regulatory Requirements

- The related ICAO documentation (PANS TRG) states that Air Traffic Safety Electronics Personnel (ATSEP) is the ICAO-recognised terminology for personnel proven competent in the installation, operation and/or maintenance of a CNS/ATM system. It also states that it is the responsibility of the ANSP to define the scope of the ATSEP.
- State regulatory norms should define the requirements with respect to safety management according to recommendations quoted in ICAO Annex 19 (SMS) and quality management system. For each ANS provider, technical and competencies training shall relate ATSEP profile to safety and quality requirements established by contracting states.
- State regulatory norms should define the requirements with respect to age, knowledge, experience, skill and attitude which determine ATSEP competency. Chapter 4 of ICAO Annex 1 — Personnel Licensing, however, contains Standards for other personnel, and States should consult them when establishing their requirements.

Purpose of the ATSEP Training Manual

- The primary purpose of the Manual is to provide training organizations and operational units with explicit guidance on how to determine what competencies are necessary in their environment and then, what training is needed during the various phases of ATSEP development.

- The training manual draws on the ATSEP Competency Framework (that will go into PANS-TRG) and best practice established today.

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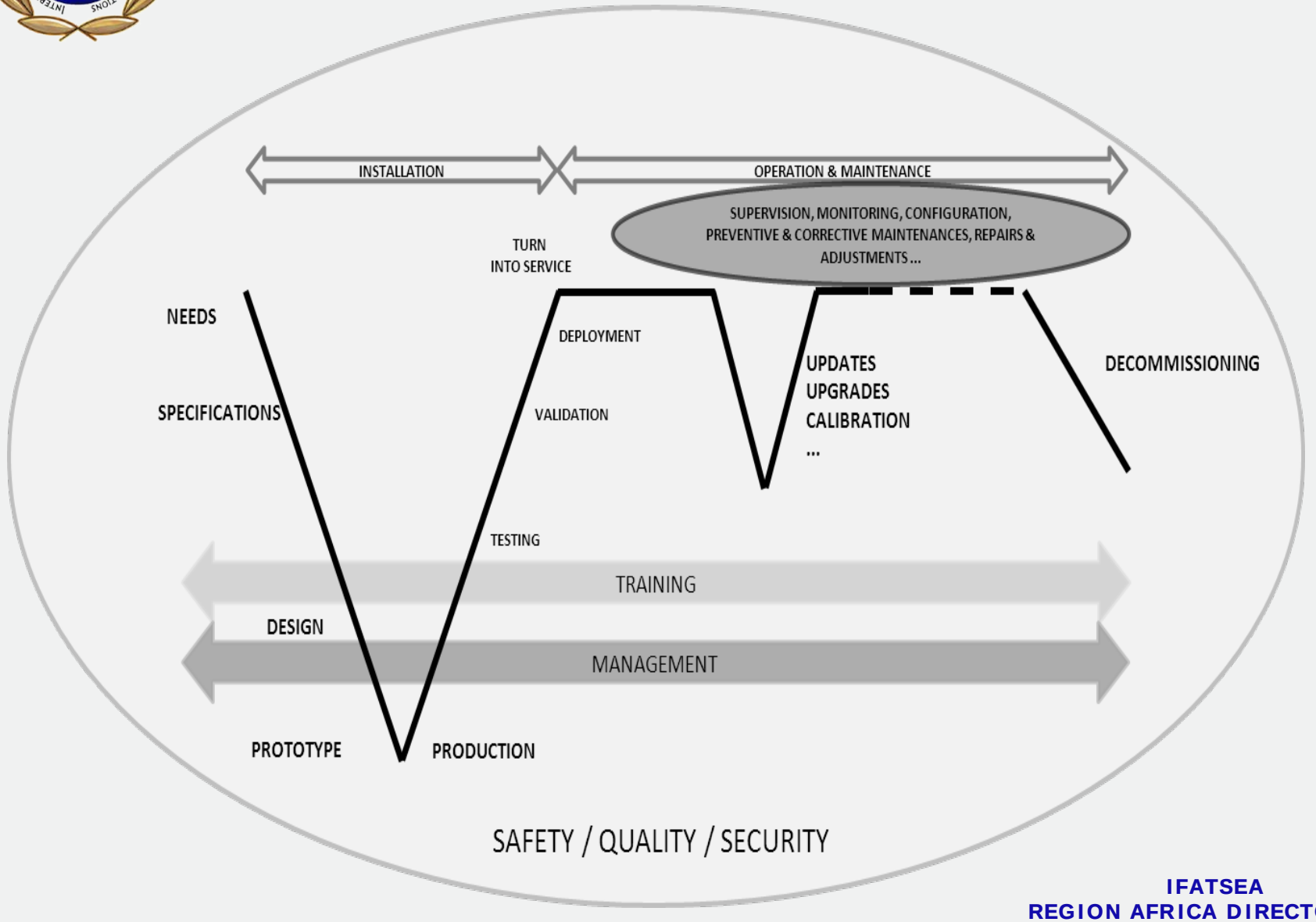

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For example, the following aspects may be considered in the local scoping process of ATSEP activities:

- Operational activities deals with e.g. supervision, monitoring, control and reporting in real time of technical services, supported by electronic systems and/or equipment for CNS/ATM

- Maintenance activities deals with e.g. preventive maintenance, corrective maintenance and/or modification and updates of supporting electronic systems and/or equipment for CNS/ATM

- Installation activities deals with e.g. project management, specification, conception, validation, integration, test & acceptance, safety assessment, calibration, certification, optimization and upgrade of supporting electronic systems and/or equipment for CNS/ATM, engineering activities

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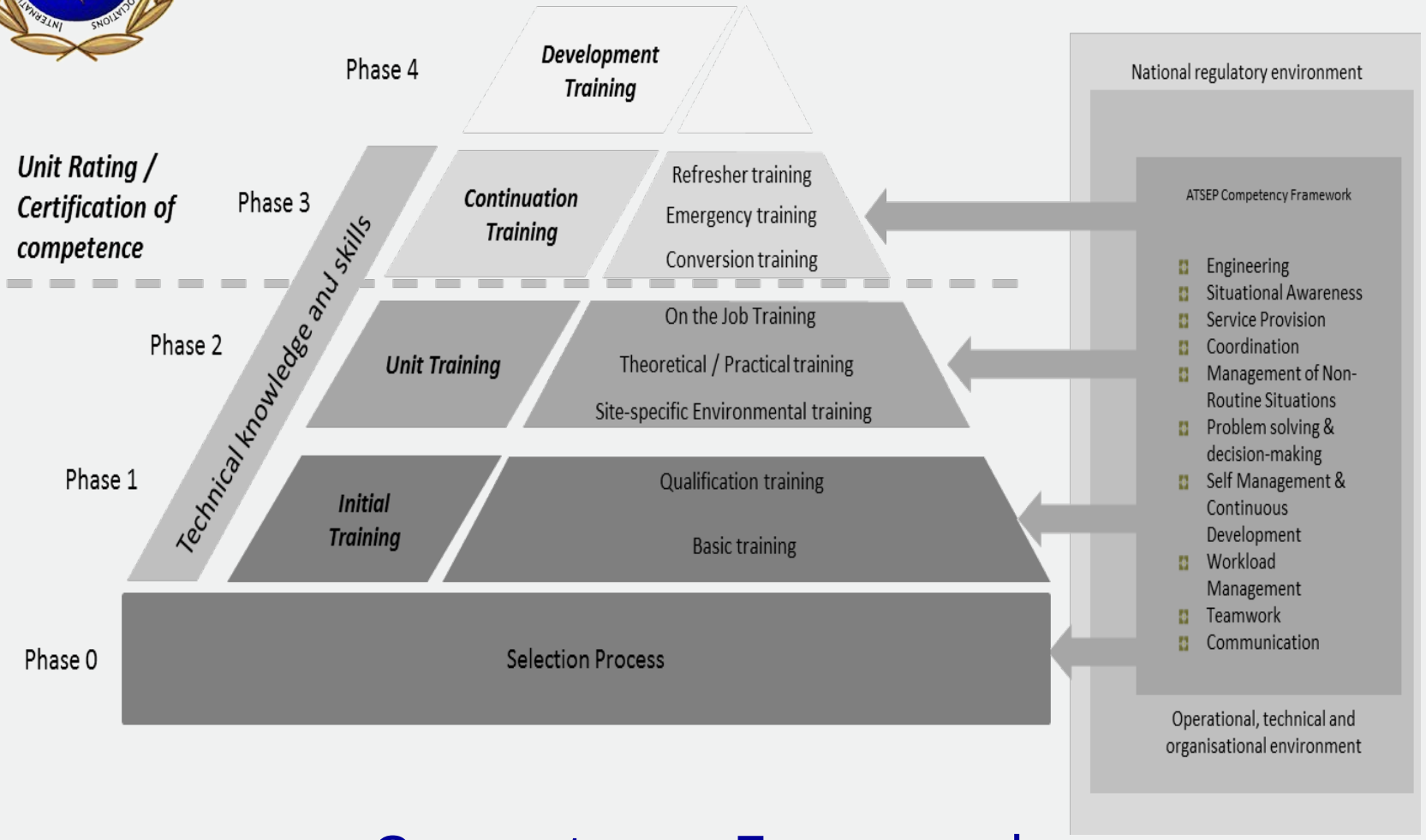

Competency Framework

Principles and Processes to Develop Competency Based ATSEP Training

- Develop rating-specific competency model(s)
- Develop training material
- Develop a continuous feedback system to assess the effectiveness of the competency based training and identify means to make improvements as necessary
- Establish the assessment process
- Document the training process

New structure of the

ICAO ATSEP Training Manual

Chapters
Chapter 1. Introduction
Chapter 2. Principals and Processes to develop Competency-based ATSEP Training
Chapter 3. Initial Training Modules
Chapter 4. Unit Training
Chapter 5. Continuation Training
Chapter 6. Developmental training
Appendices. Training Objectives

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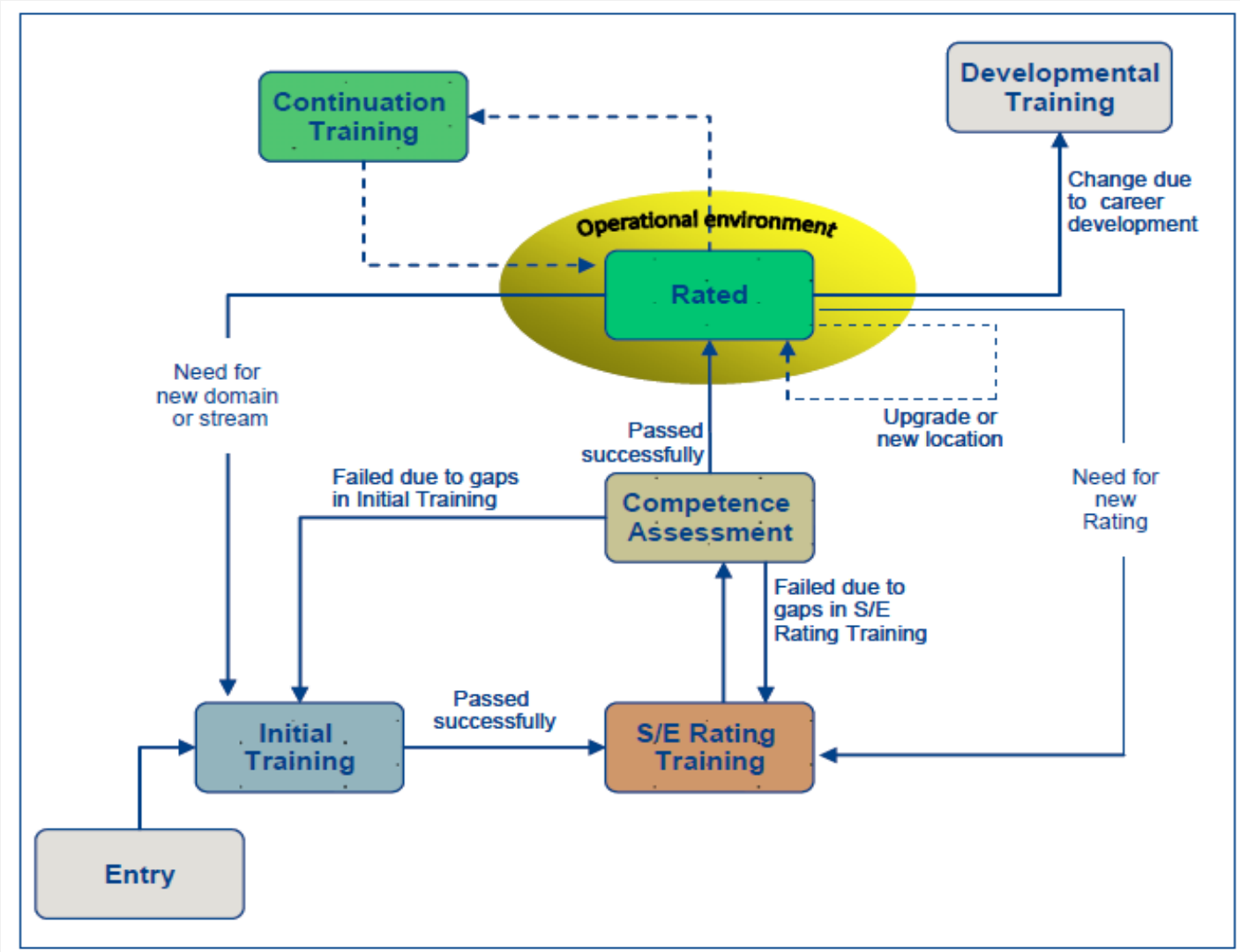
Guiding principals

- In the case of Initial Training, the determination of ‘what’ training is needed, is explicitly linked with the competence framework.
- In the case of Unit Training, the ‘what’ training is unique to the local operating environment, therefore the process is described and the elements of unit training plans detailed.
- In the case of Refresher Training – the process for determining the training is described and a matrix of possible refresher training topics/scenarios is provided with their mapping across to the ICAO Competency Framework.

Principal of Training



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Chapter 1. Introduction
Chapter 2. Principals and Processes to develop Competency-based ATSEP Training
Chapter 3. Initial Training Modules
Section 3.1. Initial Training – Basic
Section 3.2. Initial Training – Communication
Section 3.3. Initial Training – Navigation
Section 3.4. Initial Training – Surveillance
Section 3.5. Initial Training – Data processing/Automation
Section 3.6. Initial Training – System Monitor & Control

Chapter
Section 3.7. Initial Training – Infrastructure
Section 3.8. Initial Training – Engineering
Section 3.9. Initial Training – Human Factors
Chapter 4. Unit Training
Chapter 5. Continuation Training
Chapter 6. Developmental training
Appendix. List of verbs to prepare training objectives
Appendix. Examples for applying the Process
Appendices. Training Objectives

Certification and/or Rating of the ATSEP

Unit training is the final training phase for achieving competency.

After the successful completion of unit training and competency assessment the ATSEP will obtain their certification and/or rating of competence (proven Competent status).

Continuation Training

The ICAO State letter AN 7/5-01/52 requests States or Air Navigation Service Providers (ANSP) to provide recurrent training to their ATSEP. In order to meet competency requirements and international or national safety regulatory requirements, States or ANSP have to provide refresher training to their ATSEP. The specific safety requirements for ATSEP require that technical and engineering personnel have and maintain sufficient knowledge and competence.

After the successful completion of unit training and competency assessment the ATSEP will obtain their certification and/or rating of competence (proven Competent status)

- **refresher training which reviews or reinforces existing knowledge, skills and competencies;**
- **emergency training which includes training for unusual situations;**
- **Change training (System / equipment changes, upgrade and / or changes in procedures)**

Developmental training and Conversion training

During their careers, ATSEP may have to change either activity or technical domain. Dedicated training programs ensure these changes which are related to mobility of staff. Three kinds of changes are identified:

- A change in technical domain, e.g. from Communication to Navigation

- A change in job activity, e.g. from Maintenance Operator to Instructor

- A change in both, activity and domain at the same time, e.g. from Installation Engineer in Data Processing to Engineers Team Manager

Next steps:

Final Draft in December 2015

Discussion/Conclusion at ICAO Secretary

A Communication Plan will be developed for the Implementation Phase

The ICAO NGAP Task Force and the NGAP Implementation Working Group will meet 1st to 4th December 2015

Let‘s make the sky a safer place

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Good Bye for now

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Action by the meeting

- Take note of the information given above;
- Share and encourage implementation of the training Manual for ATSEP

Thank you
for
Attention

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