International Federation of Air Traffic Safety Electronics Associations

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

by
Thorsten Wehe
IFATSEA Executive Secretary

ATSEP TRAINING WORKSHOP
14 to 15 October 2015 at Entry Point North/Clarion Hotel Malmö Live
Content

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- ICAO ATSEP Training Manual
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- Vice President
- Regional Director’s
Sub-Committee’s

- ATSEP Licence
- Future ATM Systems
- ICAO
- Safety
- Training
Welcome Note

The Trade Union Air Navigation Services in Germany, GdF, is very pleased to welcome the Member Associations of the International Federation of Air Traffic Safety Electronics Associations, IFATSEA to meet for the 45th IFATSEA General Assembly in Berlin.

Berlin is the capital city of Germany, best known for its culture, street art, and numerous museums, palaces, and other sites of historic interest, as well as its many cafés, clubs, bars, and busy nightlife.

This important international event sponsored by DFS, will be held at the Conference Hotel Scandic Potsdamer Platz, in Berlin, Germany and will run from 16-20 of November 2015. It is expected to attract 300 senior industry professionals, regulators, suppliers and member associations from around the world.

The meeting will address key issues such as: Air Traffic Management framework, ATM efficiency, ATSEP training, ATSEP competency, ATSEP license, ATM/CNS standards, ICAO Standards, new technologies, interoperability, accidents investigation, human factors, SMS, SESAR, NextGen, SES, FAB, Safety Regulations, etc.

We anticipate an exciting and enjoyable meeting and look forward to welcoming you in Berlin this year!
Welcome to hotel Scandic Berlin Potsdamer Platz

The hotel is located at Berlin's central Potsdamer Platz, one of the most popular attractions of New Berlin.

The hotel has a strong Scandinavian style that brings a relaxing Scandinavian atmosphere to Berlin's busy Potsdamer Platz. The modern area offers a great selection of shops, restaurants and entertainment. It's also an area steeped in history. Situated near the former Berlin Wall, our Berlin hotel is close to Brandenburger Tor, Holocaust Memorial and German Parliament.

Facility

Enjoy a meal in our hotel restaurant with its refreshing summer meadow design, or discover ever-changing autumn in the earthly lounge bar. Our rooms have different seasonal themes - choose one that's decorated after your favourite time of year! We offer excellent meeting facilities and can host conferences and events for up to 600 people.
## Draft Program

**IFATSEA Assembly 2015 at Conference Hotel Scandic Berlin Potsdamer Platz, Germany**

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<tr>
<th>Day &amp; Time</th>
<th>Monday, 16 Nov</th>
<th>Tuesday, 17 Nov</th>
<th>Wednesday, 18 Nov</th>
<th>Thursday, 19 Nov</th>
<th>Friday, 20 Nov</th>
</tr>
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<tbody>
<tr>
<td>7:00 AM</td>
<td>Registration</td>
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<tr>
<td>9:30 AM to 5:30 PM</td>
<td>Exhibition</td>
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<tr>
<td>9:30 AM</td>
<td>Welcome Remarks by President IFATSEA Keynote Address</td>
<td></td>
<td>Competency Based Training Workshop</td>
<td>Regional Meetings</td>
<td>Plenary Session 2</td>
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<tr>
<td>10:00 AM</td>
<td>Opening Ceremony Theme of GA 2015: &quot;ATSEP’s contribution to Aviation Safety&quot; VIP Speakers</td>
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<td>Presentation of Sponsors</td>
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<tr>
<td>12:30 AM</td>
<td>Lunch</td>
<td></td>
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<td>Social Event</td>
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</tr>
<tr>
<td>2:00 to 5:30 PM</td>
<td>Plenary Session 1</td>
<td>Sub-Committees</td>
<td>Sub-Committees</td>
<td>Plenary Session 3</td>
<td></td>
</tr>
<tr>
<td>4:00 to 5:30 PM</td>
<td>Competency Based Training Q &amp; A</td>
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<td></td>
</tr>
<tr>
<td>7:00 PM</td>
<td>Welcome Cocktail</td>
<td>Discover Berlin</td>
<td>Discover Berlin</td>
<td>Gala Dinner</td>
<td></td>
</tr>
</tbody>
</table>

**Stand 01.09.2015**

**Coffeebreak will be offered during the morning and afternoon sessions**
Nancy Derby
Event and Sponsorship Coordinator
nancy@ifatsea.org
Mobile: +353 87 333 02 43 (IRL)
worldwide economic situation

- Dangerous threat?
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.
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.
The standards for ATSEP to be implemented by ICAO 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.
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
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.
If 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
ATSEPs
Do you think I‘m sexy?
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.
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.
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.
Date: 3 - 4 December 2014
Location: ICAO Headquarters
Venue: Montréal, Canada
Procedures for Air Navigation Services
PANS-TRG (Doc 9868)

Updates
PANS-TRG

- ICAO Documents
- Purpose
- Major Changes
- Major Elements
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
# New PANS TRG structure

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Part Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Procedures</td>
</tr>
<tr>
<td>2</td>
<td>Training and Assessment for Aircraft Operational Personnel</td>
</tr>
<tr>
<td>3</td>
<td>Training and Assessment for Aircraft Maintenance Personnel</td>
</tr>
<tr>
<td>4</td>
<td>Training and Assessment for Air Traffic Management Personnel</td>
</tr>
<tr>
<td>5*</td>
<td>Training and Assessment for Aerodrome Personnel</td>
</tr>
<tr>
<td>6*</td>
<td>Training and Assessment for Other Aviation Personnel</td>
</tr>
</tbody>
</table>

### IFATSEA – ICAO PANS-TRG

**ATSEP TRAINING WORKSHOP**
14 to 15 October 2015 at
Entry Point North/Clarion Hotel Malmö

**Executive Secretary**
Thorsten Wehe
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)
Chapter 3

- Competency Based Training and Assessment for Air Traffic Safety Electronics Personnel (ATSEP)
Considerations for Implementing Competence Based Training

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

- Standardized Performance
- Flexible
- Generic
Competency Framework

- Competency Units
- Competency Elements
- Performance Criteria - Observable Behaviors
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.
<table>
<thead>
<tr>
<th>COMPETENCY UNIT</th>
<th>DEFINITION</th>
<th>COMPETENCY ELEMENT</th>
<th>CE No.</th>
<th>PERFORMANCE CRITERIA OBSERVABLE BEHAVIOUR</th>
<th>PC No.</th>
</tr>
</thead>
</table>
| ENGINEERING     | Collaborate in developing, modifying and integrating systems, networks and equipment | • Develop specifications  
- Design the technical system  
- Support the technical system  
- Install CNS/ATM systems into an operational context  
- Evaluate new technologies  
- Manage system operational life cycle  
- Assess system performance in the performance-based operational context  
- Manage resources required for CNS/ATM systems and capabilities | CE1.1  
CE1.2  
CE1.3  
CE1.4  
CE1.5  
CE1.6  
CE1.7  
CE1.8 | • Demonstrates technical knowledge and reasoning  
- Demonstrates ability of engineering reasoning and problem solving  
- Demonstrate the knowledge and reasoning of interoperability in terms of global systems and environments  
- Demonstrates ability to set system requirements  
- Develops modelling of system and ensures requirements can be met  
- Manages development projects effectively  
- Designs implementation process effectively  
- Tests, verifies, validates and certifies new systems, equipment or installations  
- Supports system and equipment implementation  
- Optimizes systems and network elements  
- Supports system life cycle  
- Anticipates and organizes system and equipment decommissioning | PC1.1  
PC1.2  
PC1.3  
PC1.4  
PC1.5  
PC1.6  
PC1.7  
PC1.8  
PC1.9  
PC1.10  
PC1.11  
PC1.12 |
<table>
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<tr>
<th>COMPETENCY UNIT</th>
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<th>PC No.</th>
</tr>
</thead>
</table>
| TEAMWORK       | Operate as a team member | • Foster an atmosphere of open communication  
• Encourage team participation and cooperation  
• Intervene appropriately, when necessary  
• Use feedback to improve overall team performance | CE9.1 | • Provides feedback constructively | PC9.1 |
|                |            |                    | CE9.2 | • Shows respect and tolerance for other people | PC9.2 |
|                |            |                    | CE9.3 | • Carries out actions and duties in a manner that supports a team environment | PC9.3 |
|                |            |                    | CE9.4 | • Uses negotiating and problem-solving techniques to manage unavoidable conflict | PC9.4 |
|                |            |                    |       | • Raises relevant concerns in an appropriate manner  
• Accepts feedback constructively  
• Shares experiences with the aim of continuous improvement | PC9.5 |
| COMMUNICATION  | Communicate effectively in all situations | • Select appropriate methods of communication  
• Use effective verbal communication  
• Use effective non-verbal communication  
• Use effective written communication | CE10.1 | • Selects communication methods that take into account the requirements of the situation | PC10.1 |
|                |            |                    | CE10.2 | • Speaks clearly, accurately and concisely | PC10.2 |
|                |            |                    | CE10.3 | • Uses appropriate vocabulary and expressions for communications with stakeholders | PC10.3 |
|                |            |                    | CE10.4 | • Demonstrates active listening by asking relevant questions and providing feedback  
• Verifies comprehension of counterparts and corrects as necessary  
• Uses eye contact, body movements and gestures that are consistent with verbal messages  
• Interprets non-verbal communication correctly | PC10.4 |

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IFATSEA – ICAO PANS-TRG

Executive Secretary
Thorsten Wehe
Flexible - Pick and Mix

CU – Competency Units
CE – Competency Elements
PC – Performance Criteria
How to use overview

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

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

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<tr>
<td>Chapter 3. Initial Training Modules</td>
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<tr>
<td>Chapter 4. Unit Training</td>
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<td>Chapter 5. Continuation Training</td>
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<td>Chapter 6. Developmental training</td>
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<tr>
<td>Appendices. Training Objectives</td>
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</tbody>
</table>
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.
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<tr>
<td>Chapter 3. Initial Training Modules</td>
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</tr>
<tr>
<td><strong>Section 3.1. Initial Training – Basic</strong></td>
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<tr>
<td><strong>Section 3.2. Initial Training – Communication</strong></td>
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<tr>
<td><strong>Section 3.3. Initial Training – Navigation</strong></td>
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<tr>
<td><strong>Section 3.4. Initial Training – Surveillance</strong></td>
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<tr>
<td><strong>Section 3.5. Initial Training – Data processing/Automation</strong></td>
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<tr>
<td><strong>Section 3.6. Initial Training – System Monitor &amp; Control</strong></td>
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</tbody>
</table>
# 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)
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
Good Bye for now
Thank you for Attention Questions?