International Civil Aviation Organization

The Fifth Meeting of ICAO Asia/Pacific Air Traffic Flow Management Steering Group (ATFM/SG/5)

Bangkok, Thailand, 30 March – 3 April 2015

Agenda Item 5: Development of Regional ATFM Framework

ATFM TRAINING REQUIREMENTS DOCUMENT

(Presented by EU-AATIP, supported by Thailand)

SUMMARY

This paper presents a further draft of an ATFM Training Requirements Document, prepared by the EU-AATIP project, supported by and in coordination with AEROTHAI, Thailand.

A previous draft of the attached document was presented to ATFM SG/4, where it was agreed that guidance from the document would be included in the Regional Framework.

It is presented in the format of an EU-AATIP deliverable, but the aim is to reach an APAC wide agreement that once the document has reached acceptable maturity, it is submitted to ICAO as draft material for inclusion in a future version of ICAO Doc 9971 Part II (Manual for Collaborative ATFM).

1.   INTRODUCTION

1.1   Attached to this Working Paper is a further draft of an ATFM Training Requirements Document, intended to provide information and guidance on the training and expertise required for personnel involved in the operation of an ATFM service.

1.2   The attached document has been prepared by the EU-AATIP project, supported by and in coordination with AEROTHAI, Thailand. The work has been carried out as part of the AATIP task 4.3, Cross border ATFM, and follows from the discussions held with the ASEAN member State ATFM experts at the EU-AATIP workshop on ATFM (February 2014, Chiang Mai, Thailand).

2.   DISCUSSION

2.1   An ATFM service needs to be staffed by personnel with sufficient knowledge and understanding of the ATM system they are supporting and the potential effects of their work on the safety and efficiency of air navigation. To ensure this and in the frame of their training policy, States and ANSPs should establish training plans to ensure that ATFM service staff are properly trained.

2.2   ICAO Doc 9971, Manual on Air Traffic Flow Management, recognizes the requirement for training all stakeholders in an ATFM service, i.e. both those directly operation and ATFM function and all other ATFM stakeholders including airspace users and ATS personnel (ref. Doc 9971 section 3.3).

2.3   The attached document provides guidance on generic ATFM training requirements. It is presented in the format of an EU-AATIP project deliverable, although the aim is to reach an APAC wide agreement that the document has reached sufficient maturity and can be included in parts as guidance material in the Regional Framework document.

2.4   To reach this required maturity, there is a requirement for APAC region States to review the document in detail and contribute to its content. In particular those States that already provide an ATFM service need to ensure that the content of the proposed modules are aligned with what they already practise. To achieve those contributions it is proposed that the document is tabled for discussion at the upcoming workshops to be arranged by IATA in cooperation with the ICAO RSO. AATIP will support the conduct of these workshops and would be happy to also support the discussions required to finalise the ATFM Training Requirements document.

2.5   Simultaneously, it is proposed that the document is submitted to ICAO via the newly created ATFM sub-panel of the ATM OPS panel as draft material for inclusion in a future version of ICAO Doc 9971, Part II (Manual for Collaborative ATFM).

3.   **ACTION BY THE MEETING**

The meeting is invited to:

a)   note the information contained in this paper and its attachment;

b)   discuss and review the attached document and to provide comments as appropriate;

c)   forward the document to be further discussed and finalised within Phase Two of the IATA Regional ATFM Project through being tabled for discussions during the planned workshops;

d)   agree that suitable parts of the document is included in the Regional Framework document when suitably mature; and

e)   agree that it is submitted to ICAO via the newly created ATFM sub-panel of the ATM OPS panel as draft material for inclusion in a future version of ICAO Doc 9971.

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ASEAN ATFM Training Requirements Document

In support of a sustainable ASEAN Single Aviation Market

Scope of the Document

The present document is intended to provide information and guidance on the training and expertise required for personnel involved in the operation of an ATFM service. It should be used in conjunction with the relevant ICAO Standards and Procedures as well as relevant regulations, procedures and documents that locally apply.

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1. INTRODUCTION

General

Air traffic Flow Management is an enabler of Air Traffic Management efficiency and effectiveness contributing to the safety, efficiency, cost effectiveness and environmental sustainability of an ATM system. ATFM aims at enhancing safety by ensuring the delivery of safe densities of traffic and by minimising traffic surges. Its purpose is to balance traffic demand and available capacity.

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As traffic grows, an increasing number of States are moving towards the implementation of an ATFM service. Although this is a positive development, it also generates another challenge. Because of its effect on neighboring airspaces, ATFM needs to be coordinated between States. ATFM systems therefore need to be compatible and interoperable. In this respect, the development of coordinated and harmonised training requirements is a first step in ensuring a harmonised application of ATFM.

Once demand start to reach the levels of available ATC capacity, a functioning ATFM service becomes a vital component of safe and efficient provision of Air Traffic Control services. Therefore this service needs to be staffed by personnel with sufficient knowledge and understanding of the ATM system they are supporting and the potential effects of their work on the safety and efficiency of air navigation.

To ensure this and in the frame of their training policy, States and ANSPs should establish training plans to ensure that ATFM service staff are properly trained in order to ensure the availability, continuity, accuracy and integrity levels requested for the service provided.

ICAO Doc 9971, Manual on Air Traffic Flow Management recognizes the requirement for training all stakeholders in an ATFM service, i.e. both those directly operation and ATFM function and all other ATFM stakeholders including airspace users and ATS personnel (ref. Doc 9971 section 3.3).

Due to the complexity of the issues at hand when setting out to balance demand against available implementation options, the provision of an efficient ATFM service requires that training is approached in a systematic manner.

This document addresses the need to provide for a set of training requirements to be introduced in support of a harmonised and effective ATFM function. The document describes the requirement for training for staff having responsibilities with regard to the ATFM function. It addresses the requirement for the various levels of staff in an ATFM Unit, as well as those stakeholders affected by ATFM measures. The proposed training requirements are designed to support local application of ATFM at the same time as it prepares States for a regional application of ATFM.

It is assumed that each State and/or ANSP that will set out to train ATFM service staff will have to consider the type of equipment used in their area of operation. The material in this document is made very general when it comes to training required to operate the system that is used, and will have to be detailed based on the tools used in that particular area in support of ATFM services.

ICAO and Eurocontrol sources were consulted for the development of the training concepts and methodology presented herein. The proposed training syllabus is derived with the support of in-depth ATFM service expertise.

Background

Regional networked Air Traffic Flow Management forms a major part of the ICAO ASBU framework since Block 0 (2013) through B0-NOPS. In support of the B0-NOPS module, ICAO enlisted a group of experts from States, ANSPs, and International Organisations with ATFM experience (ATFM Manual Coordination Team) to develop the ICAO Manual on Collaborative ATFM (Doc 9971), providing guidance on Collaborative ATFM implementation (published 2014).

Meanwhile, ICAO Asia-Pacific moved forward to develop ICAO Asia/Pacific Seamless ATM Plan, including provision on CDM/ATFM development to support Seamless ATM Operations in the region. Version 1.0 of the

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Seamless ATM Plan was endorsed by APANPIRG/24 meeting in June 2013. APANPIRG/24 meeting approved Conclusion 21/15 that States participate in and support the Asia/Pacific ATFM Steering Group to develop a common Regional ATFM framework, which addresses ATFM implementation and ATFM operational issues in the Asia/Pacific region.

The ATFM/SG/2 meeting in Hong Kong, China in September-October 2013 made the decision to form the ATFM Specialist Team of experienced ATM/ATFM specialist and other stakeholders to develop the Interim Framework for Collaborative ATFM with the goal for consideration at APANPIRG/25 and the Asia Pacific Regional Framework for Collaborative ATFM.

Purpose and Scope of the Document

The purpose of this document is to define a training process and specify training guidelines in order to have a common level of training for staff that operate and/or "experience" ATFM services.

In many cases an individual may already possess the required competence and experience in a particular domain and may not need to follow a formal training course on this subject. Nevertheless a process of confirm the individuals competence should still be followed. The document addresses the following:
- Who is to be trained?
- What pre-requisite skills are required or can be obtained?
- What are the job responsibilities and required competencies?
- What is the required content of ATFM training?
- What is the level of training depending on the level of responsibilities to be exercised?

Structure of the Document

The ASEAN ATFM Training Requirement Guidelines document consists of 5 Chapters, and 2 Appendices:

Chapter 1: Introduction

Chapter 2: ATFM Training Structure

Chapter 3: Ab-Initio ATFM Training

Chapter 4: From job responsibilities via competencies to training requirements

Chapter 5: Basic training

Appendix A: Glossary *(to be included)*

Appendix B: List of Abbreviations *(to be included)*

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2. ATFM Training Structure

A model of ATFM training

By means of ATFM training, it is expected that staff of an ATFM unit will obtain the appropriate skills to operate and maintain an ATFM function in an appropriate manner and consequently provide harmonised, homogenous and consistent ATFM services in the entire region.

In addition to the staff of the ATFMU itself, there are several other units/areas/entities where staff needs to be aware of ATFM services provided and the specific roles and responsibilities they carry in this process. Units where ATFM is exercised or directly experienced and where staff therefore needs training include:

- ATC
- Aircraft Operators
- Pilots
- Airport Operators
- Military, both service providers and users
- Regulatory bodies (CAAs and equivalent)

Training can be divided into several phases. These include Ab-Initio, Basic training, On-the-job training, Advanced training, and Recurrent/Refresher training.

An ATFM service is provided at different levels, each with its own training requirements. The different levels of ATFM responsibilities considered include the operations management and supervision levels, planning and execution of the service and essential support staff. In addition, there are different support functions, CDM partners and general ATM personnel that need to be considered when developing training requirements.

This guidance document proposes a six level (taxonomy levels) set of training objectives for each ATFM population grouping depending on the level of responsibility to be exercised by each group.

- Level 0: To be aware of
- Level 1: A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.
- Level 2: The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.
- Level 3: A thorough knowledge of the subject and the ability to apply it with accuracy. The ability to make use of the repertoire of knowledge to develop plans and activate them.
- Level 4: The ability to establish a line of action within a unit of known applications following the correct chronology and the adequate method to resolve a problem situation. This involves the integration of known applications in a familiar situation.
- Level 5: The ability to analyse new situations in order to elaborate and apply one or other relevant strategy to solve a complex problem. The defining feature is that the situation is qualitatively different to those previous

(source: EUROCONTROL Specification for the ATCO Common Core Content Initial Training)

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This paper proposes that a matrix should be constructed to determine the level of training and competency required for each group in the ATFM population. A partial matrix template is shown below. This is developed further in the document. The levels are shown for illustrative purposes only.

Subject	Operations management	Supervision	Planner	Execution	Support	CDM partner	General ATM personnel
ATM	2	2	2	2	2	1	1
ATFM	2	3	4	3	2	2	1
ATC	2	2	2	1	1	1	1
Airport operations	2	2	2	2	1	1	1
Aircraft operations	2	2	2	2	1	1	1
Meteorology	2	2	3	3	2	1	1
ICAO	3	2	2	2	2	1	1
ATFM tools	2	2	3	3	3	2	1
Capacity assessment	2	2	2	1	1	1	1
Airspace design	2	2	2	1	1	1	1

Phases of ATFM training

General
ATFM training can be divided into a number of phases. This document concentrate on training requirements for Ab-Initio and Basic training, other phases are only discussed briefly.

Ab-Initio Training
Ab-initio training is intended to ensure that new ATFM staff possesses the necessary contextual knowledge in order to follow the more detailed job related training. In many cases staff may already possess this knowledge (e.g. ATC staff will possess the necessary ATC knowledge, Airline operations personnel the necessary aircraft operations knowledge). The possession of the necessary ab-initio subject knowledge should be assessed upon recruitment / assignment. In cases where staff possess the necessary contextual knowledge these staff may be exempted in whole or part from elements of ab-initio training.

Basic Training
Basic training is the main phase where the core ATFM and associated operational topics are covered in a comprehensive fashion. Basic training also covers more detailed knowledge of subjects related to ATFM than in ab-initio training. At the successful completion of basic training the staff member should have all the relevant knowledge to proceed to on the job training before performing his role in the ATFM operation.

On the Job Training
ATFM, in common with many other operational occupations requires a substantial amount of practical application of the occupation under appropriate supervision in order to ensure that the acquired knowledge from the basic training course(s) can be applied in an autonomous manner. The purpose is to reinforce formal training and support the achievement of competency standards. If appropriate, OJT phases can also follow advanced or refresher training.

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Advanced Training
As ATFM functions develop, a number of advanced ATFM analysis and application techniques are used. Secondly some staff involved in the execution of ATFM will require a higher level of skills and advance training modules will be required for both such cases. The purpose of advanced training is to augment the skills and knowledge of ATFM personnel in dealing with either more specific, complex problems or a wider breadth of issues.

Recurrent/Refresher Training
It is essential that ATFM personnel update his or her competencies in accordance with the latest operational requirements, and new methodology/technologies applied. Regular recurrent training should therefore be planned. It is important to maintain the current skills of ATFM personnel. Some ATFM techniques are applied only in very rare situations (contingency, exceptional events). ATFM personnel can be absent from their core operational function for extended lengths of time. For these three reasons recurrent/refresher training modules will be required.

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3. Ab initio ATFM training

Ab-initio training is intended to ensure that new ATFM staff possesses the necessary contextual knowledge in order to follow the more detailed job related training. In many cases staff may already possess this knowledge (e.g. ATC staff will possess the necessary ATC knowledge, Airline operations personnel the necessary aircraft operations knowledge).

Basic Requirements

The possession of the necessary ab-initio subject knowledge should be assessed upon recruitment / assignment. In cases where staff possess the necessary contextual knowledge these staff may be exempted in whole or part from elements of ab-initio training.

There are several basic requirements or pre-requisites for the successful conduct of ATFM training. These include:

- Pre-requisite skills and experience (e.g. experience in ATM, aircraft, airport operations)
- Complementary skills (IT skills, written and oral communication skills, operations analysis, statistics experience)
- Medical requirements
- Language requirements

Normally these competences and requirements form part of the recruitment requirements. The definition of these general requirements is beyond the scope of this document. However, material is readily available in the public domain from other ATM related functions that can assist those responsible for recruitment and training to draw up appropriate general competency and experience requirements.

ATFM Ab-initio training content

The following subjects need to be covered in the Ab-Initio Training phase. It is recommended that the appropriate taxonomy level for ab-initio training is between level 1 (basic knowledge) and 2 (understand and discuss).

Level 1: A basic knowledge of the subject. It is the ability to remember essential points, to memorise data and retrieve it.

Level 2: The ability to understand and to discuss the subject matter intelligently in order to represent and act upon certain objects and events.

ATFM as described by ICAO is a collaborative process between ATC and the Airspace User facilitated by the ATFM units. Airport operations authorities are also an essential ATFM partner. It is therefore suggested that these partners should be closely associated with the training content development and delivery. The ab-initio training should include facilitated visits of the operations units of these stakeholders.

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Ab-initio: Aviation Law and Institutional Background

Phase	Ab-Initio
Subject	Aviation Law and institutional Background
Objective	**Understand** the national and international regulatory context of ATM in general and ATFM.

Content	Reference Documents
• International Aviation Structure and Organisations	
• National Aviation Structure	
• National Aviation regulations	
• Structure of ANS and ATS	
• Institutional international and national background of ATFM	
• Safety Management Principles	

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Ab-initio: Air Traffic Management

Phase	Ab-Initio	
Subject	Air Traffic Management	
Objective	Learners shall **understand** the basic principles of air traffic management and be able to **discuss** basic operational procedures.	
Content		Reference Documents
• Air Traffic Control Service (Aerodrome, Approach, En-route, Oceanic)		Annex 11
• Flight Information Service and Advisory service		
• Alerting Service		
• ATFM Introduction		Annex 11, Doc 4444, Doc 9971, Doc 7030, ATFM Manuals introduction
• Airspace Management		
• Altimetry and Level allocation		Annex 2
• Separations		Doc 4444

• ATM Data
    o ICAO designators
    o
		Doc 7910

• Flight Plan processing		Doc 4444, IFPS manual

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Ab-initio: Air Traffic Flow Management

Phase	Ab-Initio	
Subject	Air Traffic Flow Management	
Objective	Learners shall **understand** the basic principles and origin of air traffic flow management and be able to **discuss** basic operational procedures.	
Content		Reference Documents
• Objectives of ATFM		Doc 9971
• Benefits of ATFM		
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Ab-initio: Aircraft

Phase	Ab-Initio
Subject	Aircraft
Objective	Learners shall **<u>understand</u>** the basic principles of the theory of flight and aircraft characteristics and how these influence ATS and ATFM operations.

Content	Reference Documents
• Principles of flight	
• Aircraft Engines	
• Aircraft Systems and Instruments	
• Aircraft categories	
• Factors affecting aircraft performance	
• Aircraft performance data	
• Flight efficiency concepts (economic, environmental)	
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Ab-initio: ATM Equipment and Systems

Phase	Ab-Initio	
Subject	ATM Equipment and Systems	
Objective	Learners shall **<u>understand</u>** the basic working principles of equipment that is in general use in ATC;	
Content		Reference Documents
• Radio communications		
• Radar, Primary, secondary, mode S, CPDLC		
• ADS		
• AFTN, OLDI, AIDC		
• AMAN, DMAN, ASMGS		
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Ab-initio: Airport Operations

Phase	Ab-Initio	
Subject	Airport Operations	
Objective	Learners shall **<u>understand</u>** the operations related functions carried out at airports.	
Content		Reference Documents
• Aerodrome infrastructure		
• Airport capacity		
• Airport scheduling, coordination. Airport slot allocation		
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• Management of maintenance		
• Management of disruptive events		
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Ab-initio: Airline Operations

Phase	Ab-Initio	
Subject	Airline Operations	
Objective	Learners shall **<u>understand</u>** the ATM operations related functions carried out by aircraft operators.	
Content		Reference Documents
• Airspace Users operating models (hub, point to point, major carriers, low fare sector…)		
• The airlines operations Centre		
• Airspace Users (scheduled, non-scheduled, business, general aviation, military)		
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Ab-initio: ATFM and CDM

Phase	Ab-Initio	
Subject	ATFM and CDM	
Objective	Learners shall **understand** the fundamental CDM concepts underlying effective ATFM	
Content		Reference Documents
• ATC v ATFM		
• ATFM; bridging the gap between ATC and airline operations		
• CDM competencies		
• CDM skills		
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Ab-initio: Meteorology

Phase	Ab-Initio	
Subject	Meteorology	
Objective	Learners shall __understand__ how meteorology affects ATS operations and aircraft performance and limits ATFM capacity.	
Content		Reference Documents
• Basic introduction to meteorological phenomena		
• Aviation meteorological forecasts and observations		
• Understand the meteorological hazards to aviation.		
• Weather and capacity		
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4. *From job responsibilities via competencies to training requirements*

Introduction

The first steps in the process of designing detailed training requirements, are to:

- Identify job responsibilities and associated performance and measurement criteria;
- Identify the competencies required to meet these job responsibilities and performance.

With full understanding of job responsibilities, it is possible to determine what the competencies are of a fully competent staff member. Items that may be needed to perform this analysis include:

- the specific job or position description or summary,
- specific ATFM organisation performance requirements or competencies,
- Standard operating procedures that apply to an individual's position or responsibilities.

When the pre-requisites described above are identified and analysed, it is possible to design the training required to address the gaps through the development of the learning objectives for each competency that needs to be addressed. Based on the identification of the learning objectives, a curriculum can then be designed.

The link between ATC and ATFM

Before looking at the details of the job responsibilities of an ATFM Unit, there is a requirement to understand its links with ATC. ATFM is a cross-domain activity, and even if the focus have shifted from the early task of protecting ATC from overload to a more comprehensive demand/capacity balancing activity, there are still very strong links between ATC and an ATFM service.

The ATC Supervisor is accountable for the provision of ATC services for enroute and TMA operations within the FIR`s for which this service is being provided. As part of that responsibility, he/she is normally also accountable for all strategic and tactical ATFM decisions. In a smaller ACC the supervisor may keep that responsibility, but in a larger ACC this is often delegated to an "Airspace Manager", either being the Flow Management Position (FMP) in the ACC or the ATFM Unit (ATFMU) Supervisor.

To be able to take these strategic and tactical decisions there is a requirement for a large measure of ATC knowledge, and when this responsibility is delegated to an FMP and/or ATFMU Supervisor it normally requires that the staff manning these positions have an ATC background. Over time when management knowledge is passed on and complexity issues in sectors are documented and understood by the ATFMU, there may not be a need for this pre-requisite. However, it is important that the training provided is such that the FMP and/or

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supervisor of the ATFMU is able to fully understand and discuss ATC operations so that the expected outcomes can be achieved.

Over time, the objective is to develop the ATFMU to become an integral part of ATC so that it is seen as the manager of the airspace, ensuring the delivery of the right amount of demand in the right shape to achieve maximum capacity.

Main tasks of an ATFM Unit

The objective when defining the tasks of an ATFM Unit should be to ensure that the ATFMU become the focus for an effective management of airspace availability and capacity. The ATFMU should manage and coordinate actions associated with optimising demand against the capacity of the airspace, ensuring that the complexity of traffic does not exceed the capability of the control service.

The ATFMU should maintain a strategic and tactical overview of the network (airspaces and airports within and adjacent to its area of responsibility), being responsible for the development of tactical ATFM strategies, and for managing network responses to demand and capacity issues.

The main tasks of a service provided by an ATFM unit include:

- Receive and analyse all ATFM data and associated parameters;
- Plan and coordinate capacity adjustment for next day's operation;
- Plan and coordinate ATFM Daily Plan for the next day's operation;
- Manage proper execution of ATFM Measures on day of operation based on ATFM Daily Plan;
- Coordinate tactical capacity adjustment on ATM resources with the local ATC Supervisors;
- Monitor and execute ATFM Measures on day of operation as required based on ATFM Daily Plan;
- Ensure proper integration of traffic demand inputs;
- Ensure proper configuration of ATFM automation support systems;
- Ensure optimisation of resources through an efficient CDM process;
- Provide focus and specialist expertise for planning, coordinating and implementing measures for capacity management and contingency operations;
- Conduct post operations analysis of previous days ATFM operation.

Competencies for staff executing ATFM

To perform ATFM tasks, staff needs to be trained to possess a number of competencies. They need to have full knowledge of the FIR and/or airports for which the service is applied. They also need to understand the factors that impact on the capacities for the various parts of airspace and airports, and they need to be fully aware of the impact on the provision of ATC that the different actions they propose to implement may have. In order to be effective, the ATFMU needs to coordinate and cooperate closely with ATC, airports and civil and military airspace users.

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The required competencies include the ability to:

- Determine an accurate picture of air traffic demand;
- Receipt, verify, evaluate, enter and store all relevant ATFM data;
- Monitor the evolution of demand versus capacity identifying all shortfalls and opportunities for optimisation;
- Determine the need for ATFM measures in all phases of ATFM;
- Draw up and publish ATFM plans and any changes to the plan (understand what Information to be published);
- Create, maintain, monitor and adjust all relevant ATFM scenarios and measures;
- Ensure that AOs are provided with advice and guidance for minimising delays and disruption;
- Know and adhere to all relevant operational instructions, operations manuals and letters of agreement (actively locate, read and follow instructions).

ATFMU Operational Staff Job Descriptions

The job descriptions of staff operating an ATFM facility will depend on the chosen organisation. For the purposes of this document the following job descriptions are proposed. Depending on the local organisation responsibilities may be delegated or not, and functions may be combined or subdivided.

- ATFM Unit Operations Manager
- ATFM Unit Supervisor
- ATFM Unit Planner
- ATFM Unit Office (executive)
- ATFMU Support Assistant
- ATFMU CDM partner

ATFM Unit Operations Manager Job description

Each ATFM unit should have a clearly designated line manager directly responsible for the overall operation of the unit. He is the immediate hierarchical superior of the ATFMU supervisors. Although not normally involved in the direct execution of ATFM it is recommended that the Operations Manager be subject to an appropriate form of training and competency assessment.

The job description of the Operations Manager is not defined in this document as this will vary according to the organisation management structure. However it is strongly recommended that the Operations Manager acquire and maintain level 2 (ability to **understand** and to discuss the subject matter intelligently in order to represent and act upon certain objects and events) competence in all the subjects contained in the basic training content.

ATFMU Supervisor Staff Job Descriptions

The duties of the supervisor/manager of an ATFM service function include:

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- Ensure self-briefing and that all ATFM staff are fully briefed on all aspects of the operation;
- Plan and coordinate with ATC supervisor capacity adjustment for next day's operation ;
- Plan and coordinate ATFM Daily Plan for the next day's operation;
- In coordination with local ATC supervisor manage local and network resources to optimise capacity and minimise delays within their areas;
- Supervise the proper execution of ATFM Measures on day of operation based on ATFM Daily Plan;
- Organise, chair and conduct all necessary CDM conferences;
- Proactively use their experience and authority in an appropriate manner, be creative and use initiative in the resolution of problems that may arise using an inclusive collaborative process;
- Execute all appropriate staff management duties fairly and transparently in accordance with local procedures and processes;
- Manage disruption and contingency procedures and ensure appropriate escalation;
- Ensure ATFMU management is aware of all significant events;
- Ensure accurate log keeping and recording of all significant occurrence.

ATFMU Planner Staff Job Descriptions

The duties of the planning function of an ATFM service include:

- Manage and execute the short term strategic and pre-tactical operational processes and post operational evaluation;
- Maintain a good level of coordination with the ATC Supervisor in order to negotiate the best possible pre-tactical solutions including negotiating improved capacity, applying ATFM regulations where necessary and proposing & implementing the optimum ATFM measures for the network;
- Create and continuously adapt plans and to propose new solutions taking into consideration ever changing circumstances;
- Proactively provide all reasonable assistance to the airspace users in order to facilitate them to optimise their operations;
- Endeavour to maintain the principles of network optimisation and collaborative decision making during all ATFM processes;
- Coordinate ATFM solutions with other operational functions (tactical, AMC, Flight Planning);
- Ensure that the ATFM network plan and all changes are fully communicated with Aircraft Operators, Airports and Air Traffic Control Centres;
- Evaluate execution of the ATFM plan in order to determine lessons learnt and issues for future attention.

ATFMU Officer Job Descriptions

The duties of the ATFM Officer function of an ATFM service include:

- Execute the tactical flow management operational process from a network perspective;
- Constantly monitor traffic loads on all ATFM resources;
- Monitor any potential and actual changes in capacity (e.g. staffing, weather, airport infrastructure, etc.) and implement appropriate measures;

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- Maintain a good level of co-ordination with the ACC/airport in order to negotiate the best possible tactical solutions including negotiating improved capacity, applying measures where necessary and proposing & implementing re-routing scenarios;
- Continuously adapt plans and to propose new solutions taking into consideration ever changing circumstances;
- Proactively provide all reasonable assistance to the airspace users and air navigation service providers in order to allow them to optimize their operations;
- Endeavour to maintain the principles of network optimization and collaborative decision making during all relevant ATFCM processes;
- Coordinate tactical capacity adjustment on ATM resources;
- Ensure the promulgation of all measures taken.

ATFMU Support Assistant Job Description

The duties of the ATFM Support Assistant function of an ATFM service include:

- Coordination with external clients (airspace users, ATS units, military) under the supervision of planning and executive staff;
- Reception, validation and input of ATFM data;
- Ensure proper integration of traffic demand inputs;
- Maintenance of operational documentation;
- Responding to routine queries from external clients, providing standard information and referring issues to planner and officer where appropriate.

Note: The duties of the Support Assistant function will depend on which executive position the support function is assigned to. It is suggested that the same basic training curriculum is followed for support and executive staff, but that the level of knowledge and competency required be at a lower level.

CDM partner Job Description

The duties of CDM partners are not defined in this document. It is suggested that the training authority selects the appropriate subject and competency levels for each CDM partner group based on the detailed training requirements below.

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5. Basic ATFM training

Basic training is the main phase where the core ATFM and associated operational topics are covered in a comprehensive fashion. At the successful completion of the class room training part of the basic training the staff member should be fully prepared to begin his/her period of OJT in the pre-tactical and/or tactical area. He/she should have achieved all the relevant knowledge and skills and be able to understand the concept of ATFM, the operating procedures in place and the use of related equipment.

The start of the training should be preceded by an information session providing the training aims and the overall planning for the entire training. As part of the information session, trainees would be informed about the design of the training modules, and their expected involvement during the training. The following modules need to be covered during the Basic Training phase:

1. Foundational objectives and principles of ATFM
2. ATFM Institutional and Regulatory background
3. The CDM Process in the context of ATFM
4. ATM Planning
5. ATFM Phases
6. ATFM Demand
7. ATFM Measures (Traffic Management Initiatives)
8. Weather and ATFM
9. ATFM Contingency Procedures
10. ATFM Data
11. ATFM Tools
12. ATFM Phraesology

When deciding on training content for a specific Basic Training course, it is important to consider:

- the position the trainees are going to be trained for, i.e. the job responsibilities;
- the competencies required to carry out the tasks; and
- the background of the trainees, i.e. the competency level.

Based on those three criteria and the training requirements they indicate, the content of the modules described below can be adapted to fit the needs of a specific course.

Activity 4.3
Training requirements for ATFM

Basic: Foundational objectives and principles of ATFM

Phase	Basic
Subject	Foundational objectives and principles of ATFM
Objective	o understand the philosophy of air traffic flow management, and of the objectives and principles of ATFM; o know how the ATFM service operates; o know the terms and definitions used; o know the structure and organisation of the ATFM service function, including the roles and responsibilities of the stakeholders in the ATFM service; o understand the training requirements for stakeholders in the ATFM service.

Content	Reference documents
• Objectives and principles • Benefits of ATFM • How the ATFM service operates • Systems, processes and operational data that supports the application of ATFM • Basics of a CDM process • Link to ASM, Civ/Mil coordination • Organisational structure • Roles and responsibilities	o ICAO Doc 4444, o ICAO Doc 9971, o Local ATFM doc.

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	3	5	5	4	3	2

Activity 4.3
Training requirements for ATFM

Basic: ATFM Institutional and Regulatory Background

Phase	Basic
Subject	ATFM Institutional and Regulatory background
Objective	o know the regulatory background, both global and local, for the application of an ATFM service.

Content			Reference documents		
• ICAO standards and recommended practices (Annex 11, Annex 15) • ICAO procedures (Doc 4444, doc 7030) • Local rules and procedures (AIP, Letters of Agreement, local procedures, Start-up procedures, departure sequence)			• ICAO Annex 11 and 15 • Doc 4444 • AIP and other local documentation		
Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	5	5	4	3	2

Activity 4.3
Training requirements for ATFM

Basic: the CDM Process in the context of ATFM

Phase	Basic
Subject	The CDM Process in the context of ATFM
Objective	o Understanding of how the CDM process allow decisions to be taken to best meet the operational requirements of all concerned. o Full knowledge of the process to communicate and exchange operational information among stakeholders on a real-time basis

Content	Reference documents

• Principles of CDM
• CDM requirements and benefits
• Stakeholder roles and responsibilities
• understanding of the interaction with other stakeholders at the various stages of the process
   o ATFM Operations and airports
   o ATFM Operations and aircraft operations
   o ATFM Operations and meteorology
• Link to A-CDM
• CDM organisation and structure
   o Support to ATFM stakeholders
• Means of communication
   o e-conf, tele-conf etc.
	• Doc 4444
	• Doc 9971
	• Local ATFM documentation

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	4	4	4	3	2

Activity 4.3
Training requirements for ATFM

Basic: ATM Planning

Phase	Basic					
Subject	ATM Planning					
Objective	o Understand the process to optimise available capacity, and how to use other available capacities; o Be aware of factors impacting capacity.					

Content	• ATM Planning
	   o Route network design
	   o ACC sector design
	   o Quantify imbalance between demand and capacity
	   o How to address the imbalance at the strategic phase
	• Capacity assessment models
	   o ATC workload assessment models
	   o Capacity monitoring and intervention concepts and values
	• Staffing schedules and opening schemes of the component ATC Units
	• Capacity optimisation
	• Factors reducing capacity
	• Coordination with ASM
				• ICAO Doc 4444
				• ICAO Doc 9971
				• Local ATFM doc		

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	4	4	4	3	2

Activity 4.3
Training requirements for ATFM

Basic: ATFM Phases

Phase	Basic
Subject	ATFM Phases
Objective	Understand the main principles for how the ATFM processes are applied during the different phases in order to balance demand and capacity within a given area.

Content	Reference documents

• Strategic Phase
   o Strategic to pre-tactical
   o Annual and seasonal ATFM plans
   o Special events planning
   o ATFM simulations
   o
• Pre-tactical Phase
   o Pre-tactical processes
   o Building a pre-tactical plan
   o The concept of a rolling plan
   o Airport role during pre-tactical
   o Aircraft operator role during pre-tactical
• Tactical Phase
   o Slot allocation process, incl. principles, computer assisted or manual allocation process, and change process
   o Re-routing flights
   o Manual actions on a flight
   o Tactical management of the daily plan
   o
• Post-Ops
   o Requirements for post-ops analysis
   o Feedback and evaluation
   o Operational feedback
   o Incident reporting
   o The ATFM learning loop
	• Doc 4444
	• Doc 9971
	• Local ATFM documentation

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	5	5	4	3	2

Activity 4.3
Training requirements for ATFM

Basic: ATFM Demand

Phase	Basic					
Subject	ATFM Demand					
Objective	o know the process of quantifying demand into traffic volumes based on particular locations and associated flows; o understand the configurations used and the establishment of pre-defined scenarios; o understand how traffic demand, the tactical traffic situation and met forecasts can be used to optimise capacity; and o understand issues related to occupancy.					
Content	• Traffic forecasts • Schedules and flight plans, including missing flight plans • Airport slots • Flight position reports • Determining demand o Establishing demand for a sector/airport o Establishing demand along predefined major traffic flows o Entry rates v occupancy • Determining Traffic Volumes based on defined demand o Determine reference locations o Define major traffic flows in a traffic volume • Demand adjustment scenarios			• Doc 9971 • Local ATFM doc		
Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	4	5	4	3	2

Activity 4.3
Training requirements for ATFM

Basic: ATFM Measures

Phase	Basic	
Subject	ATFM Measures (Traffic management Initiatives)	
Objective	o Know the different measures available and how to apply them in the ATFM service; o Understand the role of the stakeholders in the process.	
Content	• Capacity Optimisation measures (sector/airport management, complexity reduction) • Demand distribution measures (routing scenarios, level capping, advancing traffic, balancing arrivals/departures, Ground delay) • Demand regulation/reduction measures(Airborne delay/holding, minimum departure intervals, miles in trail, policy, out of area traffic, adherence) • Exemptions and exclusions Slot adherence • Slot swapping and slot extensions policy • Delay causes • Delay attribution • Procedures for the application, modification and cancellation of ATFM measures • Responsibilities for compliance with ATFM measures • Compliance monitoring and reporting	• Doc 4444 • Doc 9971 • Local ATFM doc

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	5	5	4	3	2

Activity 4.3
Training requirements for ATFM

Basic: ATFM Disruption and Contingency procedures

Phase	Basic					
Subject	ATFM Contingency procedures					
Objective	Full understanding of procedures to be applied in the case of a contingency.					
Content	- Contingency procedures - ACC contingency ATFM plans - Management of exceptional events - Non-availability of airspace/airports - Adverse weather situations - Convective weather - Low visibility - Wind - Winter weather			Local ATFM documentation		
Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	5	3	3	2	1

Activity 4.3
Training requirements for ATFM

Basic: Weather and ATFM

Phase	Basic					
Subject	Weather and ATFM					
Objective	Full understanding of local weather phenomena and their influence on ATM operations and ATFM capacity.					
Content	- Convective weather - Low visibility - Wind - Winter weather - Airports and Enroute weather situations - ATFM anticipation of adverse weather - ATFM recovery from adverse weather - Weather and the ATFM daily plan			- National met service documentation - Local ATFM documentation		
Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	5	3	3	2	1

Activity 4.3
Training requirements for ATFM

Basic: ATFM data

Phase	Basic					
Subject	ATFM Data					
Objective	Ensure full knowledge of all relevant ATFM data sets and their components Understand the requirement for ATFM data sharing and distribution					
Content	- Aeronautical data - NOTAMs - Schedules - Flight Plans and associated messages - ATFM messages - Flight data in ATFM - Flight activation messages - Surveillance position reports - Data exchange and sharing			- ICAO Doc 4444 - ICAO Doc 9971 - Local ATFM documentation		
Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	4	5	4	3	1

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Activity 4.3
Training requirements for ATFM

Basic: ATFM tools

Phase	Basic	
Subject	ATFM Tools	
Objective	Ensure full knowledge of the function and use of tools providing support to the application of ATFM	

Content	• ATFM Support tools
	  ○ Pre-tactical tools including ATFM simulators
	  ○ CDM tools
	  ○ Tactical ATFM monitoring and execution tool
	  ○ Post operations tools
	  ○ Additional support tools and applications (e.g. standard IT applications and specific tools such as weather, traffic forecasting tools)
		• Material provided mainly by ATFM system supplier

Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	3	4	4	4	1

Note: The content of this module will be largely dependent of the local tools and systems used. This module will be quite extensive, and the content will be closely related to the functions to be executed.

It is strongly recommended that suitable practical training material and suitable instructors are included in the requirements at the acquisition phase of any ATFM system. Consideration should be given to the acquisition of appropriate ATFM simulators to facilitate delivery of this module.

It is recommended that this module be delivered using hand on practical in a phased process during the conduct of the theoretical modules above.

Activity 4.3
Training requirements for ATFM

Basic: ATFM Phraseology

Phase	Basic					
Subject	ATFM Phraseology					
Objective	Ensure adequate level of ATFM working language Ensure full command of appropriate ATFM phraseology and sufficient knowledge of ATFM working language to clearly communicate internally and externally Ensure good general language level for ATFM staff involved in CDM processes					
Content	•				• General language training • Local ATFM manual	
Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	4	4	4	4	4	3

Note: ATFM training should be conducted in the working language of ATFM of the unit concerned.

Activity 4.3
Training requirements for ATFM

Basic: Local ATFM Procedures

Phase	Basic					
Subject	Local ATFM Procedures					
Objective	Ensure full knowledge and understanding of all relevant local ATFM procedures for the position concerned. Ensure good general knowledge and understanding of all other local ATFM procedures.					
Content	•				• Local ATFM manual and operating procedures	
Role	Operations management	Supervision	Planner	Execution	Support	CDM partner
Level	2	4	4	4	4	2

Note: The contents of ATFM manuals and procedures should clearly identify which ATFM has responsibility for the execution of each procedure.

Activity 4.3
Training requirements for ATFM