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Report on Issues in ATCO Manpower Planning

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Abstract

The document describes the process of manpower planning and addresses strategic as well as tactical planning constituents and associated planning problems that have a direct or indirect influence on the planning of quantitative manpower requirements in Air Traffic Service (ATS). The planning constituents identified and described were put into perspective by a conceptual process model of manpower planning. Mandatory and complementary elements in staffing that normally are related to the calculation of staffing or multiplication factors and therefore have a direct influence on the number of staff needed to man operational positions were identified and described.

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CONTACT PERSON : H. Rathje

TEL : 3955

DIVISION : DED5

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AUTHORITY	NAME AND SIGNATURE	DATE
Chairman Pilot Group on ATCO Manpower Planning	H. RATHJE	27.06.1995
Chairman EATCHIP Human Resources Team (HRT)	C.P. CLARK	28.09.1995
Senior Director Operations and EATCHIP (SDOE)	W. PHILIPP	29.02.1996

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EXECUTIVE SUMMARY

This report is based on work undertaken in 1995 by the Pilot Group on ATCO Manpower Planning (PGMP) of the Human Resources Team (HRT) of the European Air Traffic Control Harmonisation and Integration Programme (EATCHIP).

The document provides management and manpower planning experts in national Air Traffic Service (ATS) administrations with concise information on strategic and tactical planning constituents as well as associated planning problems that have a direct or indirect influence on the planning of quantitative manpower requirements in ATS.

Chapter 1, Introduction, gives the background and the purpose and scope of the document. The work method used by the Pilot Group is also described.

Chapter 2, Model of the Manpower Planning Process, shows how and to what effect the planning constituents were put into a systemic perspective. The conceptual process model of manpower planning is described in more detail in chapter 3.

Chapter 3, Components of the Manpower Planning Process, identifies and describes the planning constituents at the strategic and tactical levels of the manpower planning process. Important planning problems associated with these constituents are discussed.

Chapter 4, Mandatory and Complementary Factors in Staffing, identifies and describes those elements in staffing directly related to staffing calculations and multiplication factors for operational ATS units.

Chapter 5, Summary of Conclusions, identifies the main strategic and tactical problem areas that should be focused upon in future developments in manpower planning.

The Annex contains a definition of terms used in the document and a list of abbreviations.

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1. INTRODUCTION

This document refers to Specialist Task 03 “Planning and Development Programmes for ATS Staff” of the Human Resources Business Plan (Edition 3.0) of the EATCHIP Work Programme (EWP) Document.

This report is based on work carried out by the Pilot Group on ATCO Manpower Planning (PGMP) in 1995.

The PGMP was created at the second meeting of the then Manpower Sub-group (MPSG) in January 1995 and established by the Human Resources Team (HRT) at their third meeting. The PGMP met twice (25-26 April and 26-27 June) in order to identify the manpower planning requirements for ATCO's.

1.1 Scope

The document describes the manpower planning process and addresses strategic and tactical planning constituents as well as associated planning problems that have a direct or indirect influence on the planning of quantitative ATS manpower requirements.

The planning constituents identified and described by the PGMP are put into perspective by a conceptual process model of manpower planning. The model was derived in a second step by the Pilot Group.

Finally, particular attention is given to mandatory and complementary elements in staffing that are directly related to the calculation of staffing or multiplication factors for operational ATS units. Those elements are identified that normally have a direct influence on the number of staff needed to man operational positions and should therefore be taken into consideration.

Conclusions are derived with regard to the main strategic and tactical problem areas that should be focused upon in future developments in manpower planning.

The recommendations and conclusions of the SGAMI Group and the personnel requirements set out in ICAO Doc. 9426 (Part I, Section , Chapter 1 and 2; Part IV, Section 1, Chapter 2) were taken into account by the PGMP.

Note: Management changes and the increased use of a business-oriented approach by certain national ATC organisations can have an impact on the planning and management of human resources in those organisations. These issues were not addressed by the group.

1.2 Purpose

The purpose of this document is to report on the work of the Pilot Group on ATCO Manpower Planning (PGMP) and to describe their findings.

The document provides management and manpower planning experts in national ATS administrations with information on strategic and tactical planning constituents as well as associated planning problems that have a direct or indirect influence on the planning of quantitative manpower requirements in ATS.

1.3 Work Method

The PGMP chose the Project Team Work (PTW) method with which to make their investigations into the manpower planning process. The PTW method enables work on complex problems to be approached using visual and interactive techniques. It is a structured work technique which provides an orderly mechanism for obtaining qualitative data and information from groups familiar with a particular problem area. A facilitator guides the process by which the team arrives at consensus and commitment to decisions and actions. Each member of a PTW team is required to present his or her experience and concepts of the 'real' situation. The knowledge and experience of team members are key elements in developing purposeful concepts and solutions.

PTW normally consists of six phases. Working through these phases is not seen as a one-off exercise but rather as a cyclic and iterative process which provides the flexibility required when addressing new developments and requirements.

The PGMP identified four of these phases as being sufficient for their purposes:

1. Leading question: In order to begin gathering ideas on the subject the team began the process by formulating the question:

“What problems, threats and opportunities should be considered in ATCO manpower planning at both tactical and strategic levels”?

2. Brainwriting: Each team member then wrote down as many answers to the question as possible. These ideas were displayed around the meeting room so that other team members could develop or expand them.

3. Idea explanation: The facilitator asked the team members to explain and discuss their ideas in-depth in a structured way to improve common understanding and to agree definitions.

4. Clustering: The team identified ideas of similar content in order to find a consistent structure for the subject. Finally, common headings were defined for each cluster.

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2. MODEL OF THE MANPOWER PLANNING PROCESS

Using the main clusters (cluster headings) and the cluster statements, a systemic conceptual model of the manpower planning process was developed. (Figure 1).

The model takes account of all identified planning considerations at the different strategic levels, the manpower planning activities and sub-activities of implementation, and includes selection, training and implementation.

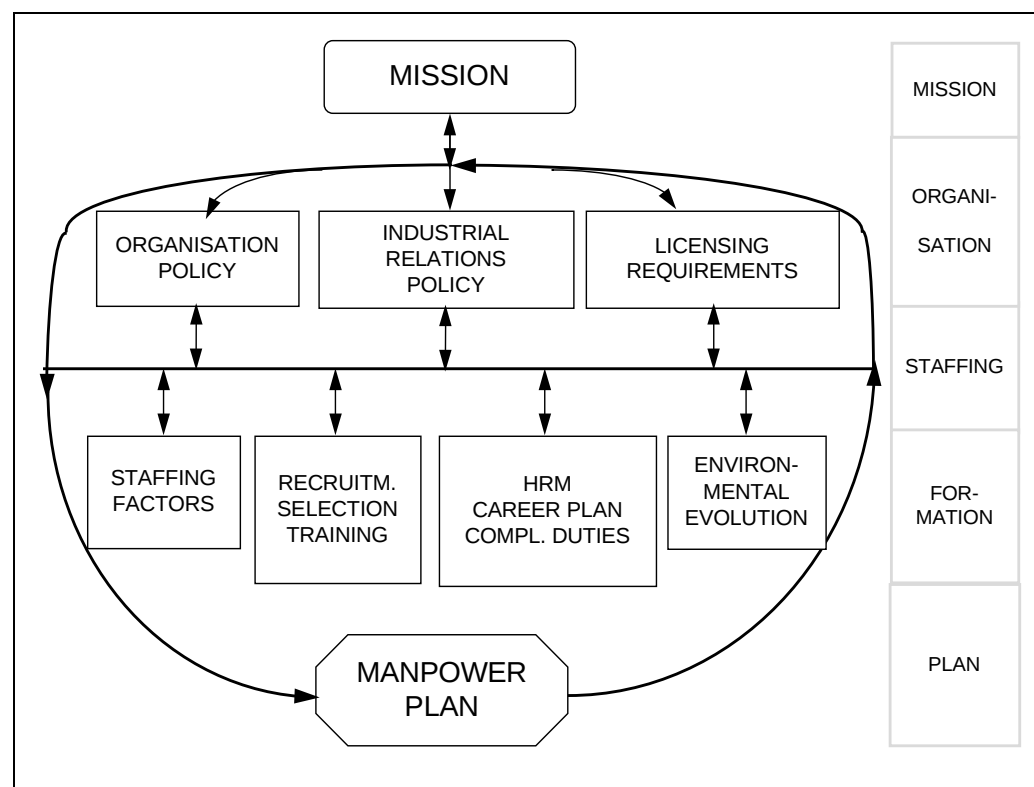


Figure 1: Systemic Conceptual Model of ATS Manpower Planning

The three main interlinked levels of this model are:

Organisational Level

This level concerns relatively fixed principles and policies relevant to manpower planning.

Formation Level

This level concerns the short to long term processes in Human Resource Management in general and manpower planning in particular.

Staffing Level

This level concerns the various mandatory and complementary factors that have to be taken into account in the staffing of operational positions.

The following chapters provide detailed information on each topic.

3. COMPONENTS OF THE MANPOWER PLANNING PROCESS

3.1 Mission

A high level mission statement on manpower planning has to be agreed within the ATC organisation. It should state what ATS has to be provided by a unit together with the root definition of manpower planning.

The mission statement must be updated regularly to ensure the maintenance of quality with regard to the safe and expeditious handling of traffic. Due recognition must be given to the impact of any workload increase associated with traffic growth and also of environmental changes which should include general working conditions and equipment deterioration or update.

Service offered

The policy on the Air Traffic Service to be provided (e.g. AIS, ATC, AFIS, FIS, Alerting Service etc.) must be clearly stated.

Root definition of manpower planning

The following root definition of the purpose of manpower planning was agreed by the PGMP:

“ATCO manpower planning must provide a sufficient number of qualified personnel, on a timely basis, to ensure the provision of an air traffic control service.”

The PGMP considers this definition as preliminary and recommends that, in order to develop it, further consideration should be given to the conceptual model.

3.2 Organisation Policy

The broad principles of personnel management and manpower planning should be defined and taken into account:

Need for policy decisions

A policy statement should be issued on:

- calculation of staffing factors,
- rostering schemes and criteria to be applied,
- budgetary considerations.

Human Resources Management policy

The principles of Human Resources Management should be defined and established in congruence with the mission and the specific objectives of the organisation in terms of the service to be offered and customer requirements / demands to be met.

Responsibility of manpower planning

The terms of reference for the manpower planning unit must be clearly defined and cover items such as:

- industrial relations policy,
- operational staffing factors,
- selection criteria and methodology,
- training requirements,
- personnel and career development.

Budget limitations related to organisational policy

Adequate financial provision has to be made to provide the ATS.

Integrity of investment and manpower planning

Organisational investment in manpower must be adequate to provide the necessary personnel.

Implementation and update of manpower plan

The time frame (duration of the plan) has to be defined. The manpower plan must be regularly reviewed and updated to reflect changes in working practices, traffic loading and the current ATS requirements.

3.3 Industrial Relations Policy

Policy on industrial actions and industrial relations

The manpower plan must have full regard for organisational policy concerning industrial relations.

Political and trade unions guidelines

One of the key terms in industrial relations policy is 'flexibility of the workforce'. Freedom to vary or adjust the quantity and quality of the workforce in response to changes in demand is influenced by the ATC organisation, the

actions of the state (labour law jurisdiction) and by the association of labour, for example in trade unions.

Flexibility must be located more securely within national regulations and institutional legislative frameworks but must also take into account labour organisations and job regulations at a local level.

Time scale for negotiation and implementation of organisational change

Due regard must be given to the time scale required for negotiating and implementing any organisational or work practice changes which may result from the manpower plan. Manpower planners must endeavour to ensure that any proposed plan will receive the co-operation and acceptance of both the management and the staff representatives (trade unions, staff associations).

Working hours policy

The permitted working hours, normally the subject of agreement between management and staff associations/unions, must be clearly stated.

3.4 Licensing Requirements

An ATC licence indicates a controller's qualifications and shows a record of his competence at a particular unit together with his medical classification.

Licensing requirements

Licensing requirements should establish the number of ratings which can be held and maintained at any one time and be considered in parallel with training requirements.

ICAO Annex 1 SARPs

The ECAC licensing recommendations, to be defined by the EATCHIP Licensing Task Force (LTF), will be at least equal to those stated in the ICAO Annex 1, 'Standards and Recommended Practices'. It is likely however, that they will be developed to meet specific situations in Europe and have regard to future technological developments.

Policy regarding rating

The manpower plan must take cognisance of national or corporate policy with regard to the number and type of ratings which can be held and maintained by ATCOs.

It should be noted that the demand to have a multi-licensed workforce with many ratings may lead to a lack of competence in controllers who, having checked out on many/all positions, are unable to devote sufficient time to maintaining expertise in all of them.

It is still an open question whether the 'partial licensing' (partial validation) of young controllers, which allows them to attain immediate initial 'operational' status, could be a solution to filling working positions more quickly. It should be remembered that 'full licensing' may only be deferred and that, meanwhile, the controller workforce could become very specialised; flexibility within a working unit may be compromised.

3.5 Recruitment, Selection, Training

3.5.1 Recruitment and Selection

Recruitment policy

A balanced recruitment policy will ensure that recruitment will be evenly distributed over a number of years and in advance of forecast traffic growth thereby avoiding a large age pyramid at any one time. An important long term issue of recruitment must be to avoid the inefficiencies of a 'start/stop' approach to hiring.

Selection policy

The selection policy derived from a manpower plan must allow for the intake of sufficient numbers of staff. The manpower plan must take account of:

- the actual requirements for staff allocation,
- planned retirements due to age,
- staff losses due to other factors.

Time frame for selection and recruitment

The time frame for recruiting staff must be considered in manpower planning. For example, a decision to recruit will normally result in candidates commencing training between 6 and 12 months later.

Introduction of *ab initio* trainee controllers

Direct entry students (*ab initio* trainees) invariably require extended training time compared to recruits from Air Traffic Controller Assistant (ATCA) grade. An initial decision to proceed to direct entry will require adjustment to *ab initio* basic training content and time.

Success rate in selection and training

There is a high failure rate in the selection process and many applicants need to be considered in order to recruit the required number of *ab initio* trainee controllers.

The recruitment process itself may not be 100% successful due to no-show, medical failures, failures in early training, dissatisfaction with the job itself etc. Experience indicates that provision must be made for a loss of about 25%.

3.5.2 Training

Training policy

A training policy for ATCOs should be defined which will permit the manpower plan to take account of the requirements due to:

- system upgrade training,
- refresher training,
- qualification training,
- other training requirements (e.g. due to an existing career plan, licensing scheme or regular continuation training).

Ab initio and basic training capacity

Regular consultations must be sought with the internal and/or external training authorities to ensure that intakes of *ab initio* trainee controllers can be accommodated within the classroom and simulator facilities available. If the training has to be undertaken externally an assessment must be made of the location of the training capacity, appropriate courses, timing of the intake, cost etc.

On-the-Job Training (OJT) capacity

OJT and positions where student controllers are later checked out for ratings are the most significant bottlenecks in training. The recruitment of high numbers of candidates, normally associated with a 'start/stop approach' in hiring, should be avoided as it will certainly lead to saturation and training backlogs in this training phase.

The manpower plan must therefore ensure that, once institutional training has been completed, there will be sufficient live training facilities (e.g. OJT) available so that saturation of such facilities will not occur.

A unit's capacity for OJT fluctuates during a year. For example, capacity will be limited during high traffic seasons or during leave periods. Capacity assessment therefore has to take into account the availability of staff due to leave, traffic load, the coaching of qualified staff and the positions suitable or available for OJT.

Training failures

Training is costly. A training failure not only results in the loss of invested capital but also incurs additional costs in the form of lost training places which remain vacant after candidates have left.

3.6 Human Resources Management, Career Plan and Complementary Duties

Human Resources Management (HRM)

HRM in ATC is inter alia concerned with:

- organisational decisions with regard to retirement,
- the age profile of controllers,
- career plans and career development,
- personnel development and specific personnel training.

Career development

To meet the long-term proactive aims of HRM, which are designed to increase controllers adaptive capacity in the face of changing circumstances and environmental evolution, provision must be made to harness the potential and to develop skills that enable ATCOs to pursue career paths outside the work place or in parallel with their operational duties. This will include supervisory duties, training, licensing, standards and management.

The emphasis must be on the investment in training and development to equip controllers with a wider range of skills. Where career development programmes require non-operational duties (e.g. in training, licensing, standards, management, administration) adequate financial incentives must be provided to attract operational staff out of the operational environment.

Career plan

If a career plan for controllers exists, the manpower plan must allow time for career development training and / or participation in other duties.

Age profile of workforce

The age profile of controllers should be relatively level. It must be borne in mind that it takes at least five years to adequately meet the deficit created by the loss of retiring controllers. A 'start/stop' approach to hiring will result in 'peaks' and 'valleys' in age profiles and retirement bulges will be created. This sustains the stop/start syndrome since it again calls for the immediate

recruitment of replacement trainees and results in training blockages (especially in OJT).

Age profile and training

It should also be kept in mind that older controllers may have more difficulty in adapting successfully to evolutionary changes in the design and operation of the ATC system and normally more training time is required for older controllers where system change or upgrade occurs.

Retirement age

Flexibility in retirement age makes manpower planning more difficult since the number of student controllers needed to replace retiring controllers in future years is more difficult to predict.

Temporary staff for tasks

If staff are temporarily assigned non-operational duties, provision must be made to maintain their operational competence and the validity of their ratings.

3.7 Environmental Evolution

The manpower plan must allow for major changes in the ATS. These will normally be non-recurring but nevertheless will require considerable training time away from the operational environment.

New technological developments and other evolutionary changes in the design and operation of the ATC system (e.g. reduced vertical separation minima) require time for the training and adaptation of staff.

Re-structuring units or sectors and / or licensing groups

The aim of re-structuring or re-sectorising is to reduce the complexity of work and the workload but some training must be provided to controllers to cope with the new situation.

Changes in route structure

The impact of the 'Flexible Use of Airspace' which comes on stream in March 1996 is an example of airspace reconfiguration which will require additional training.

The implementation of the flexible use of airspace concept will mean that routes can be created in areas where this was impossible before. The concept necessitates a dynamic route structure within which reduced vertical separation will be applied. The application of RVSM increases the airspace to be controlled (see EATCHIP 1995).

3.8 Manpower Plan

Given the complex nature of the ATS and the amount of investment in *ab initio* training it is desirable that a five year (at the least) manpower plan should be in place. This corresponds closely to the time between a decision to recruit and the point at which a trainee can be considered as truly productive, having completed all necessary training.

Manpower planning systems

Best practices and tools, including those validated in other working environments, should be taken into consideration.

Further research is required to identify and establish effective work organisation and methods in staffing and manpower planning, e.g. rostering methods, calculation of staffing factors.

Implementation and updates of manpower plan

After initial implementation a manpower plan must be regularly reviewed and updated. Factors that have an impact on the revision of a manpower plan include:

- traffic loading,
- range of services offered,
- changing work practices,
- work duration,
- change of rostering criteria and schemes.

3.9 Staffing Factors

Different factors may exist to determine the number of personnel needed for an operational working position. Normal practice is to calculate a multiplication factor, or staffing factor, for each position in a specific environment. The calculation should reflect local requirements:

- number and size of control positions,
- operating hours of positions,
- number of shifts per annum,
- traffic volume and traffic distribution,
- number of days per year a position is in operation,

- number of days of operation of the facility (per year),
- number of functional hours.

Note: Operational requirements, determined by the traffic volume, distribution and complexity, define the opening times of the sectors necessary to guarantee a safe and orderly traffic flow.

3.9.1 **Anomalies in the Staffing Factors Method**

It should be noted that anomalies may occur under certain circumstances which could render a standard staffing factor inadequate (e.g. different systems for calculating leave weeks and working weeks, uneven distribution of work cycles, rostering schemes used).

The staffing factor method takes into account the standard working time and covers all categories of absence but in a theoretical way. It does not take into account the inevitable efficiency loss or balancing losses inherent in all rosters. The staffing factor method cannot therefore be used to estimate the **exact** number of staff needed. It consistently fails to give an exact figure because, for example, it assumes:

- the effective working time of controllers to be fully accommodated,
- the effective time for breaks (rest periods) to be fully accommodated and evenly distributed,
- the number of leave and sickness days to be evenly spread over the year.

Roster balancing losses lead to a situation where the actual numbers of staff needed to run a certain roster are higher than the numbers calculated theoretically using the staffing factor method.

Further research is required to assess the implications of any change in staffing related issues as outlined above in order to identify any possible threats and dangers in manpower planning at an early stage.

Efforts should also be made to assess the implications of anomalies in staffing factors and to reveal and quantify balancing losses in roster schemes applied.

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4. MANDATORY AND COMPLEMENTARY FACTORS IN STAFFING

The subject of Staffing Factors needs to be addressed in more depth. Consideration is given here to the general factors relevant to the provision of personnel for control positions. These are classified as mandatory (standard shift factors) or complementary (non-standard shift factors) and are presented in Figure 2.

Figure 2: Personnel Factors in Staffing

Mandatory Factors	Complementary Factors
Off-days, Duration of Working and Rest-periods - Rest-days - Annual leave and public holidays - Duration of working week - Duration of working day - Duration of rest-periods per day	Training - System upgrade training - Refresher training - Language training - Qualification training - Conversion training
Sick Leave	Career Training - Instructor courses - Examiner courses - Management courses - Airspace and systems training - Study leave
Special Leave - Maternity leave - Recuperation leave - National obligations	Non-operational Duties - Staffing of training centre - Expert team participation - Participation in projects - Administrational work - Industrial relations activities
Licensing Factors	Contingencies - Rating failures - Loss of license - Loss of staff
Medical Examination	
Health, Safety & Welfare at Work	
Environmental Evolution - Traffic growth - Airspace reconfiguration	

4.1 Mandatory Factors

4.1.1 Off-days, Duration of Working- and Rest-periods

Rest-days

The number and definition of rest-days has to be taken into account.

Annual leave and public holidays

Annual leave can vary and may be based, for example, on age. The distribution of leave over a year is certainly not even and provision should be made well in advance to avoid periods where not enough staff is available for the duties (e.g. during school holidays).

Local differences might exist due to public holidays.

Duration of rest periods (breaks)

The duration of a shift, the maximum time at a position without a fatigue break, the number of night duties permitted, the length of the shift cycle are all items that have to be considered when calculating the time an ATCO has to be compensated for later or will not be available at the working position.

Effective break duration may fluctuate from day to day depending on the number of staff above or below the minimum number required.

Duration of working week and working day

The following parameters are normally subject to agreement between management and staff associations and/or unions and have to be taken into account:

- maximum permitted working hours per week / day,
- maximum and minimum shift length,
- number of consecutive working days,
- the minimum time between shifts,
- possible start or end times of shifts.

4.1.2 Sick Leave

Casual uncertified sick and certified sick leave (calculated on a statistical basis) should be taken into consideration. The age profile and workload increase of the staff may influence the incidence of sick leave.

4.1.3 Special Leave

Special leave may be granted for:

- national commitments (military or volunteer reserve),
- special staff association activities,
- births, deaths and marriage,
- maternity leave and recuperation.

4.1.4 Medical Examination

ATCOs are required to undergo regular medical examinations. Normally, staff under the age of 40 are examined every two years while those of 40 or older are examined every year.

4.1.5 Licensing Factors

Licensing requirements will almost certainly include a training period associated with competency checking or rating validation.

4.1.6 Health, Safety and Welfare at Work

Some staff may be released on a regular basis in order to fulfil their health, safety and welfare training obligations at work.

4.1.7 Environmental Evolution

The manpower plan must allow for major changes in the ATS which will be non-recurring but nevertheless will require considerable training time away from the operational environment.

Traffic growth

The manpower plan must be compiled using a realistic forecast of traffic growth and its impact on individual sector loading. Allowance must be made for a possible increase in the number of sectors with a consequent need for additional staff.

Airspace reconfiguration

Direct routes or the introduction of Basic or Precision Area Navigation (RNAV) equipment may have an impact on staffing requirements.

4.2 Complementary Factors

4.2.1 Training

System upgrade training

System upgrade training is an irregular feature consequent on the introduction of new equipment or software. The training duration depends on the magnitude of the change but in any event is time consuming and must be carried out independently of day-to-day operations.

The use of temporary staff may be beneficial in alleviating the time taken or overtime used. Proper documentation will minimise system upgrade training time.

Refresher training

Refresher training normally has to be done on an annual basis. Different approaches are used in different States but overall the need for refresher training will grow. Contributors to this need are task stability (the boredom factor) and the need to maintain expertise in dealing with unusual incidents. Between 4 and 7 % of extra staff will be needed (around 1 week per annum per controller).

Language training

In many States there will be a requirement for extensive English language training. The amount of training needed depends on the entry standard. For example entry on Cambridge 1st certificate will require up to 200 additional hours training (ref. Project Supervision Team on 'Proficiency in English Language for Air Traffic Controllers' (PELA) ¹.

Qualification training

The constantly evolving European ATM system will almost certainly result in considerable modification and expansion of the ratings as defined by ICAO, with a resulting adjustment in training.

Time spent on rating courses varies due to the number of ratings required, complexity of ratings and training capacity to complete the ratings. This has to be taken into account.

Conversion Training

Controller relocation requires varying amounts of conversion training. The organisational policy on relocation must be taken into account.

¹ The PELA proficiency test is intended to be administered at the end of institutional training and is available as an EATCHIP deliverable.

4.2.2 Career Training

The time required for career development training and participation in additional duties must be allowed for if a career plan exists.

Instructor and examiner courses

Career training of ATCOs includes coaching courses, examiner courses, and supervisory courses.

Management courses

Provision must be made to enable an ATCO to pursue career development outside of operational duties. This may include full-time management or administrative duties.

Airspace and systems training

Career development for a proportion of the staff will require training in organisational procedures, airspace, route structure, liaison with national and / or international organisations, licensing, human resource management, and training for participation in complementary duties (e.g. attending meetings, participating in workshops, projects etc.).

Study leave

Provision must be made for study leave and attendance at examinations where these are relevant to career development plans.

4.2.3 Non-operational Duties

Staffing training centres

Professional credibility of training centre staff is best obtained by rotating operational ATCOs to / from the training environment. Revalidation of ratings requires time and therefore additional staff.

Expert Team participation

Career development which encourages ATCOs to participate in complementary duties such as project work, attending meetings etc., requires extra staff.

Participation in projects

The time required for an ATCO to participate in system development projects must be allowed and include attendance at meetings, participation in project work etc.

Industrial relations activities

Allowance must be made for ATCOs with responsibilities in staff associations, unions and professional bodies to participate in regular and irregular meetings.

4.2.4 Contingencies

Rating failures

Rating failures will normally occur as a result of having failed a competency check or after involvement in an incident and will normally require a refresher training period.

Loss of licence

The rate at which licences are lost is unpredictable but factors such as the age and medical fitness of the staff will have a major impact. Poor operational performance may result in some States withdrawing the licence.

Loss of staff

A buffer of staff must be built-in to allow for ATCOs moving to other environments. Frequently, the ATCOs involved in such movement are the more highly qualified and there may be a severe penalty in financial terms and training time.

5. CONCLUSIONS

The overall impression of the group was that strategic as well as tactical problems exist with regard to manpower planning.

5.1 Strategic Problems

The planning and management of human resources is very often divorced from wider organisational objectives and policies and personnel management is widely seen as an administrative function. Human resource plans on a strategic level are therefore not formulated and implemented. Often, the difficult problems involved in the recruitment, selection, training and personnel/career development of the highly skilled Air Traffic Control workforce are not addressed. Changes in working conditions and work practices alter planned objectives in ATS and should be taken into consideration and associated modifications should be incorporated in the manpower planning process as outlined in this report to avoid continuous fire-brigade measures.

Human resources have traditionally been regarded as a personnel department function. However, the PGMP believe that the subject deserves a higher individual profile and a broader perspective linked to a more proactive or 'offensive' role to create more flexibility in the long term.

The general view of the group is that manpower planning should resemble HRM and human resources planning in the important aspects of principles and strategies. This would include the furtherance of the mission of manpower planning and encompassing policy as well as practical aspects of resource planning.

5.2 Tactical Problems

The PGMP further perceived that the function of personnel management is still constrained by a reactive, 'fire-fighting' policy. Very often manpower planning is purely descriptive and becomes a theoretical exercise. As a result the forward planning process is deficient and it is probable that shortages and surpluses of controller supply have yet to be identified.

Further research is required to identify and establish effective work organisation (e.g. rostering methods) and staffing methods (e.g. appropriate calculation of staffing or manning factors) and in manpower planning (e.g. forecasting). Special effort should be made to assess the implications of anomalies in staffing factors.

Research is also required to assess the implications of any change in staffing related issues outlined in this report in order to identify possible threats and dangers in manpower planning at the earliest possible stage.

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FURTHER READING

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GLOSSARY

For the purposes of this document the following definitions shall apply:

***Ab initio* Trainee Controllers:** Selected individuals, with no previous relevant qualifications, who are given basic instruction and training to enable them to obtain theoretical qualifications. Normally the *ab initio* phase ends after institutional training before entering into On-the-Job Training.

Air Traffic Service (ATS): A generic term meaning variously, flight information service (FIS), alerting service, air traffic advisory service, air traffic control service, area control service, approach control service or aerodrome control service.

Alerting Service: A service provided to notify appropriate organisations regarding aircraft in need of search and rescue aid, and assist such organisations as required.

Breaks: The time in a shift when an individual or group of individuals is not at the workplace. This includes lunch breaks, rest breaks, relief breaks, and all other forms of workplace release from work.

Flight Information Service (FIS): A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

Human Resources Management (HRM): The conscious and specific direction of effort towards the quality of the workforce in the short and long term. It involves all processes and activities aimed at managing the human resources of an organisation: manpower planning, recruitment, training & development and career management.

Licence: An ATC licence indicates a controller's qualifications and includes a record of his competence at a particular unit together with his medical classification.

Manpower: The total supply of individuals available and qualified for service.

Model: A description or analogy of a real or hypothetical situation, usually formal and simplified, which is used to develop understanding.

On-the-Job Training (OJT): The integration in practice of previously acquired job related routines and skills under the supervision of a qualified coach in a live traffic situation. The training enables student controllers to checkout as operational controllers at a specific operational unit.

Off Time: The hours a particular individual or group of individuals are not normally required to be at the workplace.

Operational Controller: The holder of a certified qualification which permits the individual to control air traffic at a specific operational unit.

Operational Requirements: Operational requirements are determined by the traffic volume, distribution and complexity. They define the opening times of the sectors necessary to guarantee a safe and orderly traffic flow.

Operational Staff: The staff working in the operational environment of ATM comprising air traffic controllers, flight data assistants, flow managers, operations room supervisors and ATM support staff.

Shift: The time of day on a given day that an individual or a group of individuals are scheduled to be at the workplace.

Root Definition: A root definition expresses the core purpose of a purposeful activity system (Checkland and Scholes, 1990).

Rostering: The allocation of human resources in order to ensure service for the scheduled working hours in accordance with legal and local procedures.

Shift Roster/Shift Schedule: The sequence of consecutive shifts and off time assigned to a particular individual or group of individuals as their usual work schedule.

Team: A team in ATS is a group of two or more persons who interact dynamically and interdependently with assigned specific roles, functions and responsibilities.

Teamwork: Group effort applied to work.

Training: The planned systematic development of the knowledge, understanding, skill, attitude and behaviour pattern required by an individual in order to perform adequately a given task or job.

ABBREVIATIONS AND ACRONYMS

For the purposes of this document the following abbreviations and acronyms shall apply:

AIS	Aerodrome Information Service
ATCA	Air Traffic Control Assistant
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATS	Air Traffic Service
ECAC	European Civil Aviation Conference
EATCHIP	European Air Traffic Control Harmonisation and Integration Programme
FIS	Flight Information Service
HRM	Human Resources Management
HRT	Human Resources Team
ICAO	International Civil Aviation Organisation
OJT	On-the-Job Training
MPSG	Manpower Subgroup
PELA	Proficiency in the English Language required by ATC
PGMP	Pilot Group on ATCO Manpower Planning
PTW	Project Team Work
RNAV	Area Navigation
RVSM	Reduced Vertical Separation Minima
SARPS	ICAO Standards and Recommended Practices
SGAMI	EATCHIP Select Group for Assessing Manpower Issues

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LIST OF CONTRIBUTORS

NAME	ORGANISATION / COUNTRY
Chairman/Secretary	
Mr Hermann Rathje	EUROCONTROL, DED5
Members	
Mr Tadeuz Grocholski	POLAND
Mr Thierry Lempereur	FRANCE
Mr Eoin McNerney	IRELAND
Mr Pat O'Doherty	IAN S LUXEMBOURG
Mr Alexander Skonieczki	GERMANY
Mr Dany van der Biest	IFATSEA

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