

# HANDBOOK ON COMPETENCIES FOR ENDORSEMENT AS AN AVIATION PSYCHOLOGIST AND AN AVIATION HUMAN FACTORS SPECIALIST

including Requirements for Continuous Professional Development

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# Version History

V1.0 14.12.2022	First edition
V2.0 12.07.2023	Second edition:
	<ul> <li>Removal of competency level "under development/ in training"</li> <li>Clarification of EASA regulations in relation to aviation psychologists</li> <li>Added acknowledgements of additional external reviewers</li> <li>Some clarifications and remarks in the</li> </ul>
	detailed list of competencies
	<ul> <li>Formatting changes to headings</li> </ul>

## Executive Summary

#### **Evolving Professions, Strengthening of Aviation Psychology**

The professions of psychology and human factors have evolved, and they continue to evolve. The current handbook on competencies for endorsement as Aviation Psychologists (AVPSY) and Aviation Human Factors Specialist (AVHFS) presents a 'snapshot' of the current situation provided by the European Association for Aviation Psychology (EAAP) and a dedicated working group of EAAP members.

EASA has laid down general requirements and criteria for those practicing psychological assessments, be it in the selection of pilots or in mental health evaluations. The implementation and detailing is left to the operators and national competent authorities in the EU Member States.

The Commission Regulation (EU) 2018/1042 implementing rule CAT.GEN.MPA.175 Endangering safety has been extended and under (b) now includes that 'The operator shall ensure that flight crew has undergone a psychological assessment before commencing line flying'. Pursuant to that, AMC1 CAT.GEN.MPA.175(b) Endangering safety states under (a)(2) that the psychological assessment should be 'validated and either directly performed or overseen by a psychologist with acquired knowledge in aviation relevant to the flight crew's operating environment and with expertise in psychological assessment, and where possible, the psychological selection of aviation personnel'.

Part-MED in ANNEX IV of the AIRCREW regulation (Commission Regulation (EU) No 1178/2011) has also been amended. Former 'Psychiatry' and 'Psychology' articles have been merged to form the new 'MED.B.055 Mental Health', sub (a) of which is stating that 'Comprehensive mental health assessment shall form part of the initial class 1 aero-medical examination'. Pursuant to that, AMC1 MED.B.055 Mental Health (a)(4) states: 'Where there are signs or is established evidence that an applicant may have a psychiatric or psychological disorder, the applicant should be referred for specialist opinion and advice.' Pursuant to that, AMC1 MED.B.055 Mental Health (f)(3) says: 'The psychological opinion and advice should be based on a clinical psychological assessment conducted by a suitably qualified and accredited clinical psychologist with expertise and experience in aviation psychology.'

#### **Changing Role of Aviation Human Factors Specialists (AVFHS)**

More organisations recognise the need to integrate human factors into their operations, and new areas of expertise are arising (for example, user experience, usability engineering) beyond the wellestablished ones (for example, Crew/Team Resource Management, Fatigue Risk Management Systems, Critical Incident Stress Management, flight deck/ automation design). A survey of subject matter experts in the field resulted in most of the job roles and advertisements being related to the term human factors rather than aviation psychology. EAAP recognises that both specialities overlap but also have distinct differences.

#### Increasing Legal/Regulatory Requirements in Aviation

New and updated legal and regulatory requirements in aviation increasingly ask for 'eligibility to exercise/practice'. As with other professions within aviation, there is an increasing need for psychologists and human factors practitioners to provide proof of competency. It is important that the unique skill set of Aviation Psychologists (AVPSYs) and Aviation Human Factors Specialists (AVHFS) is recognised in this way.

#### Need to Update the EAAP Accreditation Requirements

EAAP introduced an accreditation scheme in 1996 as a professional peer recognition for psychologists and aviation operators who actively deal with human factors applications in their day-to-day work. It requires relevant proof of qualifications, education, and activities in aviation psychology and/or human factors and associated evidence via a concise English language resume and training certificates. The EAAP accreditation is not equivalent to any academic degree or postgraduate specialisation (e.g., psychotherapist). Requirements are unchanged since 1996.

#### **EAAP Accreditation Requirements Made Transparent**

EAAP members challenged the accreditation requirements in the past for being too ambiguous, leaving room for subjective interpretation and unfair decisions when comparing qualifications between accredited members. Those in charge of assessing the accreditation applications often found that some evidence submitted was incomplete, lacking details and relevance to applied aviation psychology and/or human factors. Additional consultation with applicants for clarification purposes are time consuming and may leave room for misunderstandings.

#### The Need for a Competency-Based Assessment

- All licence holders in aviation (pilots, air traffic controllers, engineers) must undergo initial competency assessment and continuous competency revalidation throughout their careers.
- Civil aviation authorities (CAA) certify aeromedical examiners (AMEs) based on different competency-based specialisations (airlines transport pilots (Medical Class 1), private pilots (Medical Class 2) and air traffic controllers (Medical Class 3)).
- The European Certificate in Psychology (EuroPsy) offers a European standard for competence in psychology set by the European Federation of Psychologists' Associations (EFPA). EuroPsy offers three different competency levels with psychotherapy alongside work- and organisational psychology as specialist areas. 38 European countries participate in EuroPsy. EAAP is an associate member of EFPA.
- The Centre for Registration of European Ergonomists (CREE, 2023) harmonises the certification practices of the ergonomics societies covering multiple countries. They offer a standard of knowledge and practical experience required to become a certified European Ergonomist (Eur.Erg.). Requirements comprise at least three years of university level education including at least one year of ergonomics related training, minimum one year of supervised training and two years of professional experience following supervised training, or three years, where supervision was not possible.

#### The Need for a Competency-Based Framework: Introducing the KSA Model

The term 'competence' or 'competency' can be used and interpreted in diverse ways (for example as being able to do something successfully and efficiently, or as being a leading expert in something, or as having successfully completed certain education and training). The need for a competency-based framework arises when defining the necessary knowledge, skills, and attitudes (KSA) that make a competent aviation psychologist or human factors specialist.

The proposed framework is based on the KSA model. It provides a detailed description of education and knowledge (e.g., basic psychology), empirical methods and approaches (e.g., psychometrics), common supporting skills (e.g., communication), the associated aviation domain/ operational context (e.g., airline), as well as the relevant application area of the competencies (e.g., system design).

#### The Need for Continuous Professional Development (CPD)

Aviation students and new professionals are looking for a clear career path to become a competent Aviation Psychologist (AVPSY) or Aviation Human Factors Specialist (AVHFS). Experienced professionals look to maintain currency in the various fields of aviation psychology and human factors and seek continuous professional development (CPD). The British Psychological Society (BPS) is considering CPD as both a professional expectation and a personal responsibility for psychologists, and values best practices exchange and professional growth. EFPA expects EuroPsy certificate holders to maintain and further develop their level of professional competence through CPD achieved by means of training, work experience, personal professional development, and supervision. It is envisaged that the competency-based framework is embedded in an electronically supported database hosted by EAAP that enables record keeping for continuous professional development administered by individual applicants (EAAP members) and evaluators (EAAP Board).

#### **Competency Endorsement**

The original 1996 EAAP accreditation scheme offered three distinct categories for accreditation (Junior Aviation Psychologist (JAP), Aviation Psychologist (AP), Human Factors Specialist (HF). The term 'junior aviation psychologist' has been misleading in the past and showed a gap for an equivalent category for human factors specialists. Different competency levels (e.g., novice/ beginner, advanced/ competent, proficient/ expert) are available in the literature, but are complex and time consuming to maintain and assess in practice. EAAP membership (former Full Membership) or Associate Membership require expertise and active application of principles of aviation psychology/ human factors in aviation. Those membership categories serve as a foundation for EAAP accreditation. It was therefore agreed to start with only one level, "fully endorsed" or "not endorsed" foregoing a potential level for novices/beginners. To differentiate between the previous accreditation options and the revised framework, designations were changed from AP and HF to AVPSY and AVHFS.

#### The Handbook on Competencies for the Endorsement of AVPSY and AVHFS

The present handbook on competencies for the endorsement of aviation psychologists and human factors specialists provides a detailed overview of the KSA model and competency framework including requirements for continuous professional development. The handbook includes four appendices providing additional context for the comprehensive understanding of the human (factor), advice for newcomers to the field, advice for employers when hiring and AVPSY or AVHFS and an example application form.

## Acknowledgements

This handbook was developed over a period of two years with significant inputs from subject matter experts within and outside the European Association for Aviation Psychology (EAAP). The authors would like to specifically thank all developers (core working group) and reviewers within and across the aviation industry for their critical remarks and constructive feedback.

A special thanks goes to the Italian Aviation Psychology Association (IT-APA) for sharing their original competency-based framework.

A special thank you is also awarded to the Group Reflexion Facteurs Humaines (GRFH) in France for their extensive review of the handbook and additional clarifications on the detailed competencies.

# Abbreviations and Acronyms

AoP	Area of Practice
AME	Aeromedical Examiner
AMM	Aircraft Maintenance Manual
ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
ΑΤርΟ	Air Traffic Control Officer
ATIS	Air Traffic Information Services
АТМ	Air Traffic Management
AVPSY	Aviation Psychologist
AVHFS	Aviation Human Factors Specialist
BNA	British Neuroscience Association
BPS	British Psychological Society
BRITSOC	British Sociological Association
CPD	Continuous Professional Development
CRM/TRM	Crew / Team Resource Management
CS	Certification Standard
EAAP	European Association for Aviation Psychology
EASA	European Union Aviation Safety Agency
EFPA	European Federation of Psychologists Association
EPC	European Professional Card
EuroPsy	European Certificate for Psychology
FCOM	Flight Crew Operational Manuals
IAE	International Energy Agency
ICAO	International Civil Aviation Organisation
IEA	International Ergonomics Association
KSA	Knowledge, Skills and Attitudes
NOTAM	Notice to Airmen/ Air Missions
SME	Subject Matter Experts
WG	Working Group
wно	World Health Organisation

## 1. Introduction

In 2019 the European Association for Aviation Psychology (EAAP) initiated a series of working groups related to updating their membership and endorsement (accreditation) procedures. The aim of these groups was to better reflect the changing environment in which aviation psychologists (AVPSYs) and aviation human factors specialists (AVHFS) work.

This update is related to regulations released by EASA, which require European entities to conduct a 'psychological assessment' of pilots before they commence line flying. Having a more robust endorsement procedure for EAAP's 'Aviation Psychologists' was considered beneficial in line with the increased requirement for airlines and other entities to access suitably qualified people to assist with these new assessments for pilots and other aviation-related personnel. In addition to the endorsement of AVPSYs, EAAP also offers endorsement of AVHFS. It is recognised that to date the term AVHFS is not legally acknowledged or regulated in many European countries. However, as AVHFS is the second accreditation offered by EAAP, this handbook covers both endorsements. The current EAAP requirements for accreditation as AVPSY and AVHFS have been in place since 1996, thus requiring a review and update.

One of the Working Groups (WG No. 2) was tasked to determine a robust set of competencies for both, the initial endorsement and for continuous professional development (CPD) for AVPSYs and AVHFS. This handbook is the output from the Working Group.

#### 1.1. Goals and Objectives

The main goal of the revised accreditation requirements is to provide an overall practical and ethical framework to help to frame and guide the work of AVPSYs and AVHFS.

Reason for the need of competency-based requirements include:

- It is important to develop competency requirements so that it is clear to users of AVPSY and AVHFS services what professional standards and experience they can expect when hiring or contracting someone with these endorsements. This handbook provides useful information about competencies, experience, and expertise in the areas of practice for those employing AVPSY and AVHFS.
- Safety risks are inherent in hiring practitioners who do not have the appropriate skills and experience for changing aviation industry tasks. The implementation of this competency framework helps to address this risk by ensuring a minimum standard of practice for AVPSY and AVHFS.
- This may assist also with **professional indemnity** (liability) in aviation work, in consistency with other roles in aviation such as pilots, air traffic controllers and engineers.
- Specific human factors / psychological methods in design, development, and operation of new or changed technology are required to ensure a safe, efficient, and competent operation and prevent negative impacts on people's health and wellbeing.
- As complexity in the aviation system grows, it is important to engage practitioners competent to assess changing demands on the human operators in the system and apply methods to support them to work safely both during change periods and continued use of new technology and procedures.

The WG also aimed to identify and describe new and evolving competencies that should be covered in future induction, continuous training, and development programmes of AVPSY and AVHFS of EAAP and national aviation psychologist associations.

This kind of competency framework is common among licencing or accreditation requirements for similar roles in European countries.

This document aims at:

- ✓ Providing a defined set of requirements on professional standards and experience for AVPSYs and AVHFS.
- ✓ Describing what is expected of them and offers a roadmap for career development.
- ✓ Being a useful starting point and ongoing guidance for those beginning their careers.

#### 1.2. Language

The framework currently is available in English in accordance with the ICAO Language Proficiency Level 4. Translations into other languages are not planned at this point. If you have questions about individual expressions, technical terms or if you need a translation, please contact <u>accreditation@eaap.net</u> and we will try our best to assist.

#### 1.3. Methodological Approach

To build the EAAP competency framework for AVPSY and AVHFS a broad range of information resources were reviewed. The sources included:

- 1) Existing academic / scientific course/ training programmes
- 2) Competency and ethical frameworks/ registration standards
- 3) National and international regulations, guidance material and best practices
- 4) Industry stakeholder perspectives
- 5) Job descriptions/ job advertisements

Subject Matter Expert (SME) interviews were conducted with a wide range of stakeholders throughout the industry, including practicing psychologists and human factors specialists and their employers, users of their services (e.g., airlines, air traffic management organisations), and academic course providers and researchers.

Finally, reviewers within and across the aviation industry were invited to evaluate the proposed framework for its feasibility and applicability in practice.

Overall, sixteen EAAP members from a variety of European and Non-European member countries and organizations volunteered to get involved in the review work. Ten participated in the production team, with a further six involved as reviewers.

The full methodology and detailed results from the above-mentioned review are reported in a paper presented at the 34<sup>th</sup> EAAP Conference and published in the Journal Aviation Psychology and Applied Human Factors (Biede et al., 2023).

#### 1.4. Benefits of an EAAP AVPSY or AVHFS Accreditation



#### **Benefits for Practitioners:**

- Practitioners have a framework to demonstrate their continued professional development.
- Practitioners can provide their professional services to an endorsed and accepted standard appropriate to their job and function.
- Practitioners demonstrate robust professional assessment and judgement by using recognised methods.
- Practitioners demonstrate sound accountabilities and responsibilities within the complex aviation system.
- Practitioners understand the limits of their competence in operational and ethical situations.



#### **Benefits for the Industry and Employers:**

- Industry and Employers receive an identified level of service quality and integrity; they understand / are assured that practitioners can manage human issues and impacts.
- Industry and Employers can be comfortable that endorsed practitioners have suitable technical education and aviation specific training.
- Employers have a means of indemnity and can be more comfortable in accepting proposed solutions.
- Employers have a means to raise concerns if they are not satisfied with the service provided.
- Industry and Employers have a benchmark for understanding professional competence and to help those in selection and recruitment of AVPSY and AVHFS understand benefits and expectations of their employment.
- Aviation Regulators have objective competence markers for assessment of human factors work and roles within the industry.

#### **Benefits for Universities**



- Defined competences outline career paths for students and assist students in choosing the right university programs/courses.
- Clear professional standards are provided which help to focus educational outcomes for graduates.
- Alignment with EAAP competencies may help to promote University courses within the industry.
- Define new theoretical research issues.

<u>Note</u>: While recognising the benefits of an EAAP accreditation, it is important to be mindful that this accreditation is meant as a professional peer recognition for aviation psychologists and human factors specialists who actively engage in the field of aviation as part of their everyday work. However, it is not equivalent to any academic degree or postgraduate specialisation that leads to a regulated title (e.g., psychotherapist or clinical psychologist).

## 2. Definitions of AVPSY and AVHFS

Psychology is a broad academic discipline with various sub-disciplines and contexts and cannot be captured in a single-sided definition (Reber & Reber, 2001). Different definitions exist about aspects of practice and qualifications for the fields and roles of a 'psychologist' and a 'human factors specialist'. The following definitions were synthesised from a variety of sources and used to determine the competencies that EAAP will use for endorsement in the future.

**Psychology** as a science function as both a thriving academic discipline and a vital professional practice, one dedicated to the study of human behaviour - and the thoughts, feelings, and motivations behind it - through observation, measurement, and testing, to form conclusions that are based on sound scientific methodology. It can involve the scientific study of the mind and how it dictates and influences our individual and/or collective behaviour, from communication and memory to thought and emotion (BPS, 2021).

It includes the

- Biological, physiological, neurological, and philosophical influences, as well as contributions from other sciences, for example, mathematics, physics, biology, or sociology
- consideration of individuals and of groups and group dynamics
- experimental and scientific disciplines and their combination and use in professional practice
- application of system thinking and principles to the complex interactions of people in societies, organisations, and environment.

These aspects are organised in subject matter fields or paradigms of cognitive, differential, social, educational, organisational, and engineering psychology with respective practical applications in (human) life systems.

Two more commonly understood, broad, subject matter disciplines or 'jobs' are 'Clinical **Psychology'** - dealing with mental health issues (individual mental well-being, behavioural health), and 'Occupational **Psychology'** - dealing with work related, business and organisational applications of psychology (including areas such as personnel selection, ergonomics, engineering, organisational development and change, human performance, and enhancement, coping with stress). These two job categories are widely in use to describe two divergent application dimensions of psychology.

#### 2.1. Professional Situation of Psychologists in Europe

The professional status or legal protection, acknowledgement of standards of professional and intellectual excellence is not equal across countries. Some countries recognise several specialisations of psychologists, and others only one. The term 'psychologist' is legally protected in some countries but not in others, and the rules governing the practice and application of psychology varies between countries.

The **academic** requirements of psychology as a science and research-based discipline were subject to a widely recognised 'tuning' project that started after the so-called 'Bologna process' in 2000<sup>1</sup>. This university driven project aimed to implement the Bologna process for all higher education institutions and subject areas across Europe.

European rules on mutual recognition of professional qualifications were introduced in the past to overcome the difficulty of harmonising higher education qualification across Europe. These were consolidated into the 'Professional Qualifications Directive' (Directive 2005/36/EC) applied to EU citizens leading to modernised rules for recognising professional qualifications, simplifying procedures, reviewing the scope of regulated professions, and strengthening confidence and cooperation between the Member States, first and foremost by issuing a European Professional Card (EPC)<sup>2</sup>.

Based on the foregoing the European Federation of Psychologists Associations (EFPA) issues the so-called 'EuroPsy' (European certificate in Psychology) qualification that provides a standard of academic education and professional training of psychologists to ensure equivalence on these two core aspects between European countries.

The Basic EuroPsy Certificate includes a full-time university curriculum in psychology via a bachelor's phase (3 years) and a master's phase (2 years) followed by a year of supervised semi-independent work in a particular area of professional psychology arranged through universities, professional institutions, or work organisations. This supervised training shall enable a newcomer (trainee) to develop the competences needed by a psychologist in professional practice. The supervisors assess the achievements of the trainee.

The EuroPsy Certificate is awarded if the trainee can be expected to perform as a professional psychologist in his area of practice (e.g., clinical, or occupational psychologist).

<sup>&</sup>lt;sup>1</sup> The Bologna process is named after the University of Bologna, where the joint declaration of European ministers of education was signed in 1999 aiming at comparable standards and quality of higher-education qualifications. See for an overview of actions: <u>https://www.eua.eu/issues/10:bologna-process.html</u>

<sup>&</sup>lt;sup>2</sup> EPC is an electronic certificate for the recognition of qualifications currently available for five professions excluding psychology.

#### Key Message

Whereas the EuroPsy Programme is both a university and a professional training project and focuses on the entire discipline of psychology this handbook aims to establish a **framework and standards for the application of psychology and human factors as a science and practice in the field of aviation**.

These links to the two streams of reference for the work of this group are important to understand and to appreciate the wider framework of our work.

#### 2.2. When to Engage an Aviation Psychologist?

For the following type of activities, the specific education of a psychologist provides the necessary basis to address the variability of human behaviour in Aviation.

- **People Assessments** (psychological diagnostics) in specific settings (clinical environments, selection) **including data collection** (through psychometric measurement, written surveys, observation, or interviews) **processing, analysing, interpreting, and reporting** when it requires:
  - use of psychometric tools
  - o use of clinical test batteries
  - expert psychological opinion in incidents/accidents investigation
- **Design** of new human machine interface & evaluations:
  - When it requires a **comprehensive understanding of human behaviour which is not directly accessible** when safety impact or high operational efficiency impact is at stake.
- Any setting when there is a need to access appropriate samples (as a licenced professional)
- Any setting when there is a need to extract objective, reliable, and valid, scientific knowledge

It is recommended that an AVHFS working on these tasks should be supervised by an AVPSY.

#### 2.3. Framework and Standards for Aviation Psychology and Aviation Human Factors

#### **Aviation Psychology**

Aviation psychology or aerospace psychology is a multidisciplinary applied domain of psychology. Different definitions exist for this domain and designations for psychologists working in aviation vary; some are often used interchangeably. i.e. *Aviation Psychologist, Aerospace Psychologist and Aeromedical Psychologist.* For EAAP an **Aviation Psychologist (AVPSY)** is a psychologist who works within the aviation context and has been endorsed by the EAAP board based on defined accreditation criteria.

Martinussen & Hunter (2010) define **Aviation Psychology** as '*the study of individuals engaged in aviation-related activities*' (Martinussen & Hunter, 2010, p.1). This is close to the definition of the FAA: '... aviation psychology (...) is the study of behaviours related to aviation activities. `Subsequently an **Aviation Psychologist** is concerned with '*predicting the behaviour of individuals in an aviation environment*' (Martinussen & Hunter, ibid.).

To work as AVPSYs, psychologists must be and are familiar with the technical, operational, and organisational systems and work environment in one or more branches of aviation and flying related work area in for example

- general aviation (recreational flying, aerobatic flying, balloon, gliders, ultralight sports);
- commercial civil aviation (including airlines, business aviation and airport operation)
- design of aircraft, aviation workstations or working positions;
- air navigation services (ATC, CNS, air traffic management, aeronautical information services);
- emergency services (search and rescue, ambulance flights, and fire-fighting services);
- military aviation (fighter aeroplanes, transport and airlift, helicopter, and remotely piloted aircraft systems);
- aircraft maintenance; and
- airport and ramp operations.

#### To name only a few.

AVPSYs will also need to be familiar with a broad range of roles, tasks, standard operating procedures, as well as working conditions and work environment of aviation personnel other than pilots for example:

- cabin crew;
- air traffic controllers, communication, navigation, surveillance technicians ;
- aeronautical and meteorological personnel;
- aircraft or air traffic engineers;
- airport ground handling staff; and
- maintenance staff.

Aviation Psychologists will usually work collaboratively with a range of these, and other professionals involved in aviation and need to have good knowledge about the scope and content of their work, their work behaviour, needs and stress as well as their contribution to the performance of the entire system to the safety and efficiency of aviation.

#### **Aviation Human Factors**

**Human Factors** is also a broad area of scientific study concerned with the understanding of interactions among human and other elements of a system, and the profession that applies theory, principles, data, and methods to design to optimise human well-being and overall system performance (IEA 2020).

The term "system" here means more than just a technical/ IT system. It refers to the entire aviation system including airports, aircraft, supporting personnel and assets and aviation command, control, communication, and IT systems to support and maintain safe use of airspace. (Purpura, 2013)

People who work in human factors may be from a variety of academic backgrounds including, but not limited to engineering, physiology, safety, ergonomics, neuroscience, sociology, anthropology, linguistics, medicine, cognitive science, or psychology.

Those seeking a human factors endorsement with EAAP may also have a scientific degree other than psychology. In the aviation context they may also have practical skills from another core role in aviation such as being a pilot, air traffic controller or a seasoned cabin crew member. In addition to a scientific level as a possible prerequisite, accreditation requirements related to an active affiliation with aviation remain unchanged. Retired pilots and or former ATCOs/ cabin crew are eligible for endorsement if they meet the accreditation requirements as outlined on the EAAP website: <a href="http://www.eaap.net">www.eaap.net</a>

An **Aviation Human Factors Specialist (AVHFS)** is one who applies the practical and/or academic knowledge about human factors as described above in an aviation context. There is benefit in seeking an endorsement as an AVHFS if it helps practitioners to show potential employers how and to what effect their academic (scientific) knowledge and practical skills can be applied in the aviation context. This may be especially useful for practitioners who have come from academic disciplines that are less well known in the aviation context.

There is a lot of synergy between AVPSY and AVHFS and the **Venn-diagram** following helps to provide some explanation of the similarities and differences between them.

Although it is possible for one person to hold both endorsements, it would be more usual to hold a single endorsement which is best aligned to the academic and working background standards, and professional requirements or licences.

## 2.4. Other Roles Adjacent to AVPSY & AVHFS

There are ranges of other roles, which may be adjacent to AVPSY and AVHFS but have separate and distinct qualifications and licences (although there may be overlap in areas of practice).

Whereas some of these roles require profound scientific knowledge on some aspects of human functioning, others may not require a comprehensive understanding. However, we recommend that all roles are trained on the basics of human capabilities and limitations. It would be possible for people with these specialisations to be endorsed as an EAAP AVHFS if they meet the endorsement criteria.

Some examples include:

Operational Specialists: Professionals with operational qualifications such as pilot' licences or air traffic control licences who have in-depth operational knowledge but without formal qualifications in either Psychology or Human Factors.

Engineers: A dictionary definition of Engineering suggests that it is "the branch of science and technology concerned with the design, building and use of engines, machines and structures". However, systems engineering, and human factors engineering may be more focused on overall systems and how people contribute and work with them. There are many varieties of engineering within aviation, for example mechanical or electrical engineers who work on aircraft or air traffic systems, and human factors or systems engineers who work on overall systems design and integration. Aviation Medicine: Aviation has a sub-discipline within the broader medical disciplines (e.g., doctors and nurses) which looks at issues specific to people who work in aviation. For example, an Aeromedical Examiner (AME), will examine a pilot physically for an annual medical licence to check that they are fit and healthy enough to fly safely. They have an additional role in supporting the mental health of pilots alongside psychiatrists and clinical psychologists. There are also research fields within aviation medicine that look at the effects and prevalence of disease within aviation populations, physiological impacts of flight on the human body, use of psychoactive substances, drug, and alcohol testing etc.).

Safety Specialist / Safety Management Specialist / Safety Expert: Some universities now offer specialist courses in 'Safety Science', 'Safety Management' or 'Occupational Safety' (or other variations including Safety) rather than one of the more familiar disciplines such as engineering or psychology. These courses often include a variety of models, theories, tools, and methods from various related disciplines, which are applied in an operational context – often in manufacturing, transport, or development industries. While not all safety practitioners will consider a human factors endorsement useful, human factors issues tend to form a large part of safety work.

Interface designers: Interface designers may come from engineering backgrounds more commonly than psychology backgrounds, although they may use principles from psychology and human factors to look at how users interact with their designs. In this discipline over recent years, the notion of user experience is starting to focus more on user enjoyment of designs. However, it is expected that functionality of human-machine-interfaces remains in the focus of the interface designer.

Neuroscientists: Neuroscience is the study of the brain and nervous system in both humans and non-human animals, and in both health and disease (BNA, 2021). Qualifications in Neuroscience may vary between countries, but the qualification is a post-graduate scientific degree or a medical degree with a specialisation in neuroscience.

Sociologists: Sociology seeks to understand all aspects of human social behaviour, including the social dynamics of small groups of people, large organisations, communities, institutions, and even entire societies (BRITSOC, 2021). Unlike Psychology, Sociology focuses on the behaviour of people in groups, while psychology has a larger focus on the individual elements of people and looks at group behaviour to a lesser extent.

Linguists: Language Sciences study how humans communicate using language (ranging from phonetics and up to the phonological, morphological, lexical, syntactical, semantical, discourse and pragmatics levels). In Ergonomics, it is used to ensure the operator's performance and experience in tasks that require language processing (typically, the transmission of information between the operator and a system, another operator, or a virtual agent).

For example, linguists specify, design and evaluate the texts of manuals and procedures (e.g. Flight Crew Operational Manuals, Aircraft System monitoring procedures), hard/soft labels (e.g. buttons, menus, placards), audio alerts (e.g. stall warnings), communication procedures (e.g. air traffic control phraseology), vocal user interfaces (vocal command, display, interaction), language processing support systems (e.g. speech transcription, machine translation, information extraction and retrieval applied to NOTAMs, ATIS, ATC speech, aircraft maintenance manuals (AMM)). They also define the operator's required level of linguistic

competence and training needs. They can provide recommendations for writing or oral communication (controlled natural language) to limit ambiguities and vagueness.

The scope is not limited to the verbal part of language, it also includes para-verbal and graphical aspects (e.g., intonation, typo-disposition), as well as any other symbols that support language in conveying information (colour codes, pictograms).

## 3. Competency Framework & Assessment

In the context of competency-based training and assessment ICAO refers to a competency framework, as a selected group of competencies for a given aviation discipline. Each competency has an associated description and observable behaviours. Kearns et. al. (2016) provides a broad overview of the application process of competency schemes across aviation domains. Several initiatives also reinforce competency-thinking in project lifecycles from the design phase onwards (SESAR, 2014). A recent project named "skill-up" aims to define the knowledge, skills and competences required by the future employers of the Air Transport Sector (DeepBlue, 2020).

The most recent status in Europe concerns the European Union Aviation Safety Agency (EASA), which has not defined specific requirements or criteria on the aviation and psychological knowledge and experience of psychologists performing 'psychological assessments' of aviation personnel. This task is left to the discretion of the Member States of the EU and their respective National Aviation Authorities.

Regarding competence requirements for psychologists, the EASA Acceptable Means of Compliance (Commission Regulation (EU) No 1178/2011, AMC1 MED.B.055 Mental Health) only state clinical psychological tasks for aircrew shall be performed in accordance with EU Regulation and related AMCs of EASA by 'accredited psychologists' as a professional requirement. Comparable qualitative accreditation requirements for psychologists performing other operational or human factors tasks in aviation do not exist.

## 3.1. The Knowledge, Skills, and Attitudes (KSA) Model

The Working Group examined different definitions of competency / competencies of which most consider competence 'a quality or state of (a person) having sufficient knowledge, skill, and judgement capacity to do something well'<sup>3</sup>. A skill in this context is the specific (acquired or innate) <u>ability</u> to do something while competencies are broader <u>behaviours</u> and comprise having the right knowledge and judgement (approach or attitude) to produce good results.

It is in this broad sense that the WG deliberates competencies of AVPSY and AVHFS as the quality of individuals in these professions to be productive and do their job well since acquired good knowledge and specific skills with the attitudes appropriate to the context of their work.

Competencies include the knowledge, skills and attitudes in a particular context and manifests as behaviours – ideally desirable behaviours (appropriate to the situation,

<sup>&</sup>lt;sup>3</sup> Extract from Merriam Webster Dictionary

purposeful and goal oriented). This is the reason in the later <u>Tables</u> detailed definitions of competencies are included in this handbook: The context of competency varies with the different kinds of work in which AVPSY and AVHFS are involved requiring a variant set of skills, knowledge, and attitudes.

<u>Note</u>: Ethical and legal or judicial competence is considered as a contextual factor, common to both endorsements.

It is also important to note that it is expected that both AVPSY and AVHFS will work between and with other disciplines in the aviation system, and that effective teamwork and collaboration is vital for both roles.

The fundamental structure of competencies via 'KSA', or Knowledge, Skills and Attitudes, is illustrated below.

<u>Note</u>: Some versions of this common model use 'abilities' rather than 'attitudes', but for the current work skills and abilities are too similar, whereas 'attitudes' relates to the appropriate mind-set of practitioners which is important for professional work.

The goal of the current framework is to remain aligned with the principles of the KSA model as it was first introduced for evidence-based assessments of pilots (ICAO, 2013; Kearns et al., 2016 IATA, 2021).



#### *3.1.1.* EAAP Accreditation (Endorsement as AVPSY/AVHFS)

For a full accreditation, you will have at least three years of working experience and will be able to work without supervision in your specialist areas. If you work in a team, you may now

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be considered to have a 'Senior' role. Your record of evidence will reflect robust experience during this time; for some this will be a very comprehensive understanding in a few areas of practice, and for others it may be a good understanding across a wider range of practice areas (such that you could work without supervision). You should be able to demonstrate how you meet the EAAP competencies within your work.

#### 3.2. Workflow Towards Accreditation/Endorsement

To begin an application for either AVPSY or AVHFS, applicants need to be a member of EAAP. Please refer to the Articles of the Association as published on the EAAP website (<u>www.eaap.net</u>) for all details.

Note: It is useful for members to keep any certificates for courses completed which would provide evidence of professional development and qualification. The flow diagram of the expected career paths to become an AVPSY or AVHFS shown in Figure 1.



Figure 1. Flowchart of expected career paths for AVPSY and AVHFS

When seeking accreditation, you will be encouraged to submit your curriculum vitae with an explanation of your working experience and skills gained in your career to date. Examples of evidence might include describing how your knowledge was acquired (e.g., academic or practice courses, educational qualifications, particular projects on which you have worked), and discussing the skills and attitudes you hold (e.g., considerations you made during a project, including the context and outcomes where this material is able to be shared outside your company/ employer). One example of what this may look like is included in <u>Appendix D</u>,

and you may also use the categories from the continuous development form to structure your submission.

#### 3.2.1. Appeals Process

If an application for AVPSY or AVHFS is not accepted, an appeal may be made to the EAAP Board by email to their address <u>accreditation@eaap.net</u>. Your email should include the reasons why you think that you should be accepted for accreditation, and any additional evidence you can provide to support this request. All decisions about accreditation are at the discretion of the EAAP Board.

#### 3.3. Continuous Professional Development

The competency-based framework was developed to be integrated into a Continuous Professional Development (CPD) approach based on the example of the British Psychological Society (BPS) and EFPA. BPS is considering CPD as both a professional expectation and a personal responsibility for psychologists, and values best practices exchange and professional growth. EFPA expects EuroPsy Certificate holders to maintain and further develop their level of professional competence through CPD achieved by means of work experience, personal professional development, and supervision.

It is recognized that Aviation students and new professionals are looking for a clear career path to become a competent AVPSY or AVHFS. Experienced professionals look to maintain currency in the various fields of aviation psychology and human factors and seek continuous professional development (CPD).

Therefore, it is envisaged that the competency-based framework is embedded in an electronically supported database that enables record keeping for continuous professional development administered by individual applicants and evaluators. An example can be found in Appendix C. Competency Based Assessment Form.

#### 3.4. The VENN Diagram (overarching framework)

The identified knowledge, skills, and attitudes (KSA) can be structured in five groups:

- 1) aviation domain knowledge (e.g., global aviation system and its major fields),
- 2) knowledge about humans (e.g., physiology, psychology, human factors),
- 3) methodological approaches & tools (e.g., design/validation/diagnostics),
- 4) application practice areas (e.g., selection, design, workforce management), and
- 5) common supporting skills and attitudes (e.g., critical thinking, reflective practice).

#### WHAT IS THE VENN DIAGRAM?

The need to identify the relationships between those groups, highlight overlaps and synergies led to the development of a so-called 'Venn-Diagram'.

The diagram presents the overarching framework for competencies, as well as a key list of knowledge, skills, and attitudes for both AVPSYs and AVHFSs in one picture. The circles show the overlaps and synergies between both disciplines.



## 4. Global Aviation System/Domain Knowledge

The selection of a Venn-Diagram (overlapping circles) was based on the observation that both AVPSY and AVHFS have a strong common ground on many competencies within the global aviation system. Both may work on the design of functional systems, tools, technology, jobs, organisational structure, procedures, and products in aviation. A 'functional system' means a combination of procedures, human-system interaction, including hardware and software, organised to perform a function within the specific context of, for example, cockpit or ATM / air navigation systems.

Both AVPSY and AVHFS are required to demonstrate suitable aviation-specific knowledge and overview of the entire aviation system, for example: Airline and airport operations, flight and airborne systems, air traffic control/ management, aviation engineering, ground handling, military operations etc.

#### 4.1. Operator Tasks and Environment

Operator tasks and environment means all roles, responsibilities, jobs, tasks related to aviation personnel including aircrew, ground crews, maintenance, safety investigators and other experts, authority staff, aircraft manufacturers etc. For example: Specifics of the safety driven environment of ATC and the dedication that ATCOs must build and maintain in their job on a long-term and as a career.

#### 4.2. Regulations, Standards, and Recommended Practices

This includes a thorough knowledge of current and updated regulations as published by international and national authorities (ICAO, EASA/EC/EU, CAA, FAA) including standards (e.g., aircraft certification standards) and recommended (best) practices and guidance material as published by bodies such as EASA, ICAO, IATA, EUROCONTROL, IFATCA, IFALPA etc.

#### 4.3. Operational Language

Understanding the same language (terminology) as the people AVPSY and AVHFS work with is essential to optimizing human performance and safety. Learning e.g., the ICAO alphabet, as well as standard aviation terms and phraseology is highly recommended to all AVPSY & AVHFS.

## 5. Knowledge About Humans

Each professional group has a 'core area' due to specific requirements either based on their academic training or European requirements for psychologists. For psychologists, education and knowledge about humans specifically cover human behaviour (individuals and groups), cognitive ergonomics, emotion, sensory and motor functions, attention, reasoning, mental health; and psychopharmacology. AVHFS may have a range of qualifications including physiology, human factors, safety, engineering or ergonomics, neuroscientists, sociologists and anthropologists, psychology or medical degrees. Education and knowledge about humans

for AVHFS cover human physiology, physical and cognitive ergonomics, anthropometrics, biometrics, human factors engineering, and human-system functions.

#### 5.1. Basic Education in Psychology & Human Factors

Manage the application of knowledge, skills and attitudes based on psychology and human factors to ensure a positive impact on safety, quality, efficiency, health and security, and balancing individual and other stakeholders' interests.

Note that psychology is often considered to be part of the HF discipline, for the purposes of EAAP competency evaluation it is treated as a separate field to allow for differentiation between AVPSY and AVHFS.

#### 5.2. Human Behaviour (Individual & Group)

Manage the application of principles of human behaviour to enhance the performance of individuals and groups based on physical or psychological influences while ensuring a balance between humans, tasks, systems, and organisations is maintained.

## 5.3. Mental Health & Wellbeing

Manage the application of knowledge on mental wellbeing and mental disorders to prevent/ help/ treat /support individuals and groups regarding mental health.

Practice is based on (clinical) psychodiagnostics and detection of problems, while balancing the protection of the individual's needs and rights and system or organisation's needs. Promoting aviation safety remains a central goal with any psychological intervention.

#### 5.4. Human Physiology

Manage the application of knowledge on human physiology to enhance performance and well-being while ensuring a balance between humans, tasks, systems, and organisations is maintained.

#### 5.5. Other Knowledge Related to Humans

Additional information for understanding the human related to visual, auditory, vestibular senses, principles of cognition, decision making, fatigue, motivation, stress, workload, team behaviour and human-machine interface issues.

## 6. Overarching System Methods/Methodological Approaches & Tools

AVPSY have methods and approaches specific to psychologists; for the design of jobs / roles, an AVPSY may perform a job / task analysis by gathering and analysing data and information using specific usability testing methods or employing psychometric tools such as personality or aptitude tests, which an AVHFS without psychological background would not be eligible to perform. AVPSY may also engage in a specialization in the individual, group, and organizational behaviour and working environments, practice area relating to psychometric tool development and use (especially in personnel selection and recruitment and workforce management or diagnosis of mental health issues. One additional specialist area of human performance and safety performed by AVPSY may be to engage in individual diagnosis and treatment of mental health issues following incidents or accidents, participate in peersupport programs, and or provide advice and support to medical teams.

AVHFS have core methods and approaches including risk management from design to implementation, evaluation of risk and safety strategies to risk assessment (for example hazard analysis of routine operations or changes to a system), and ongoing aviation incident and accident investigation.

#### 6.1. Statistics/Data Analysis

Including the application of adequate statistical studies, qualitative/ quantitative analysis, and modelling and understanding of the principle of significance and statistical/logical conclusions and reasoning.

#### 6.2. Job & Task Analysis

Including defining a job domain/ role, job descriptions and advertisements, creating performance appraisals, breakdown of a complex task into component tasks to identify different knowledge, skills and attitudes needed. Commons methods include hierarchical task analysis, job demand surveys, cognitive/item tasks analysis, task inventories.

For details on job analysis for air traffic control please refer to a recent review paper (Eaglestone, Damos, Hörmann, Stadler, Wium (2022)).

#### 6.3. Observations & Interviews

Ability to gather information by interviewing and observations in clinical (anamnesis), and industrial settings.

#### 6.4. Experimental/Laboratory Studies

Ability to conduct adequate experimental studies in a simulator or laboratory environment.

## 6.5. Validation & Measurement

Ability to set-up, produce and report the application of psychological and HF knowledge in system/task/operations design and validation.

#### 6.6. Training

Application of educational activities aiming to enhance the knowledge, skills, behaviour, and attitude of aviation personnel to (better) perform specific tasks.

#### 6.7. Other Methods Specific to AVPSY/AVHFS

Any other methodological approaches or tools used by either AVPSY or AVHFS. E.g., psychometric testing for AVPSY or human factors competency assessment for AVHFS.

## 7. Areas of Practice (AoP)

The Venn-diagram additionally illustrates how scopes of practice between AVPSY and AVHFS may be similar and different. Where some parts of a practice area are specific to either an AVPSY or AVHFS, this is noted. All these areas are within the context of the global aviation system.

#### 7.1. Design and Evaluation of Aviation Systems

Both trained AVPSY and AVHFS may work on the design of functional systems, tools, technology, jobs, organisational structure, procedures, and products in aviation. A 'functional system' means a combination of procedures, human-system interaction, including hardware and software, organised to perform a function within the specific context of, for example, cockpit or ATM / air navigation systems.

It is common practice for teams of people with various backgrounds to work together on design, development, and evaluation projects.

One example of this may be that a team of AVPSY and AVHFS work with technical, operational and safety professionals on the design and development of a new air traffic management (ATM) system. They will scope the parameters of the design and investigate operational requirements, physical and cognitive ergonomics and produce prototypes or test cases for various designs in an iterative process until a suitable, (useable) human-system design is reached. They will then thoroughly test the developed product by assessing human performance compared to a baseline or target and oversee the implementation. Finally, they will contribute to, or perform an evaluation of the product and provide recommendations for human performance improvements, once implemented.

For the design of jobs / roles, an AVPSY may also perform a job / task analysis by gathering and analysing data and information using specific usability testing methods or employing psychometric tools such as personality or aptitude tests, which an AVHFS without psychological background would not be eligible to perform.

#### 7.2. Individual / Group / Organisational Behaviour and Working Environments

Both AVPSY and AVHFS may engage in activities such as designing, implementing, and evaluating training such as crew or team resource management courses. Organisational

development, change management and consideration of factors such as impact of stressors, coping with stress, and safety and just culture work may also be included here.

This practice category includes any activities which seek to change individual, group, or organisational behaviours, which will include a wide variety of contexts and people at various levels of the organisation with the overall goal to reduce human error, ensure health and safety at work, and to improve, human and operational safety, productivity, or security performance.

AVPSY may also engage in a specialisation in this practice area relating to psychometric tool development and use (especially in personnel selection and recruitment or mental health and wellbeing).

Both AVPSY and AVHFS may employ specialist skills in operational competency (e.g., in technical or non-technical skills) or perform psychophysiological or cognitive assessments.

For example, the AVPSY may collaborate with stakeholders from management and operations (flight operations, maintenance) to identify competencies required for a specific job role within the context of the organizational and operational requirements. This could inform the development of, for example, behavioural event interview questions for selection or assessment or the revision of existing selection procedures.

#### 7.3. Influence on Culture (Safety and Just Culture)

Application of measures for (safety and just) culture in an organisation and development of a (safety and just culture) action plan to improve and measure behavioural changes as success criterion. Knowledge about Culture assessment / development (safety, security, just culture, organisational culture, management culture, reporting culture).

#### 7.4. Workforce Management

Workforce management include activities such as recruitment, selection, training design, training development and delivery, competency assessment and evaluation, leadership and management consultation, human performance measurement and development.

As noted above, AVPSY may use psychometric tools here, if licenced to do so and or apply measurement methods designed for the purpose at hand. Much of this work may be more common to AVPSY than to AVHFS, but teams of both may work on these activities in some organisations, alongside other company departments as, for example, the core management team, human resources, safety department, legal teams, technical or training teams.

For example, a company team led by an AVPSY may adopt a valid test package for the selection of pilots, run a selection board for several days and select suitable candidates. Results would then be collated and fed into the existing selection system for the company.

AVPSY and AVHFS may be involved in workforce long- and short-term planning, job and task design and allocation and the required skills and competences and in the design of work schedules and shift rosters for personnel in line with operational and human requirements for safety, health, and wellbeing.

For example: The introduction or re-design of air traffic controller work environment with additional or revised tasks and responsibilities, the creation of a new working position on an air traffic tower or the adaptation of a shift plan for an entire area control centre in accordance with changing operational requirements or traffic patterns.

#### 7.5. Change Management

Both AVPSY and AVHFS may work in this area. Change management may include elements from other areas of practice (e.g., creating / assessing the need for change), and may deal with change in system outputs, system activities, change of operational procedures, workflow, shifts, change of tasks, roles or jobs, or aspects of roles of jobs within an organisation.

Change management activities may include the scoping of proposed changes and helping an organisation to understand the impact of the change on both the overall system and the people within the system, and minimising safety, health and human risks associated with the change. There may also be an element of managing the wellbeing and performance of the people in the system during a change.

An example of practice in this area may be that an AVHFS helps to scope a proposed change to an airline's route between cities including a rostering time change. The tasks of the AVHFS may include to assess and understand the impact of this change on the airline and people involved (pilots, cabin crew, flight planners / dispatchers, airport staff, maintenance engineers etc.), and to implement, and evaluate the change as it progresses through the transition and adaptation to the final stage.

#### 7.6. Human Performance and Safety

This area may include AVHFS in risk management from design to implementation and evaluation of risk and safety strategies to risk assessment (for example hazard analysis of routine operations or changes to a system) and ongoing aviation incident and accident investigation.

AVHFS and AVPSY may work alongside safety practitioners to identify and manage human performance risks within an airline or air navigation service provider organisation.

An AVHFS may provide support in human factors and/or safety assurance for a system or a change, by assessing and understanding 'human error' and its impact on and from the system, understanding and evaluating potential or observed hazards, fulfilling safety management roles, design, and implementation of strategies to improve safety and prevent accidents. (This practice area has a lot of similarity or overlap with the change management area above but may include safety activities that are not related to change).

Another specialist area of human performance and safety performed by AVHFS with an ergonomic, physiological, biometric, medical, or anthropometrical background may provide human factors and safety expertise in the physical design of tools or environments (for example cockpit design). Both AVPSY and AVHFS may be involved in peer support programs, incident / accident investigation or in critical incident stress management if trained in these specific areas. Accident analysis, investigation and prevention activities may be included as part of this area of practice.

#### 7.7. Influencing Human Performance and Reliability

Both AVPSY and AVHFS may work in this area of practice that may include both physiological and psychological competency in e.g., cockpit design or the design of a standard operating procedures. It requires an understanding of sensory and cognitive functions of people including awareness, analysis, and comprehension of (complex) situations, decision making, and an understanding of ergonomics, anthropometry, and physiology. The reliability aspect looks at how people usually perform in a particular context, how they perform and succeed under varying conditions (safety II) and-prevent human error.

An example of work in this area of practice is designing an air traffic management system so that controllers can work safely, comfortably, and efficiently with a range of physical and process support tools, and operational procedures, with different traffic density (for example, with quiet air traffic or very busy air traffic, during adverse weather, or in emergency situations).

#### 7.8. Regulations and Standards

Both AVPSY and AVHFS should have a good understanding of all relevant regulations, accepted means of compliance, guidance material, specifications and standards and recommended practices that apply to their work. These will vary depending on the applicability of national or international (European) legislation and regulatory requirements, standards, and areas of practice. A variety of current regulations, standards and guidance were collected and considered in the context of this working group.

As an example, an AVPSY working for a national authority may help airlines to apply the international EASA regulation about psychological assessment of pilots within their country.

An example for an AVHFS is the application of the certification standard for large aeroplanes CS25 (CS25.1302, and CS25.1309) Human Factors requirements to aircraft system design.

Another example is the support of AVPSY and AVHFS in support to implementing the specific Human Factors requirements in Regulation (EU) 373/2017 in the management of air traffic controller stress and fatigue, introduce safety culture in the management systems, or safety support assessment and assurance of changes to the functional system in ATM of an ANSP.

#### 7.9. Scientific Research

Both AVPSY and AVHFS may engage in academic and organisational research across a very broad range of topics relating to people in aviation. This scientific research may be conducted via universities or other academic institutions or in research centres or may be done as organisational and management research or study applied in 'real-life' setting of an air navigation services organisation or and airline.

An understanding of design, development, application of research validation and evaluation methods is important for this area. As some research may involve experimentation, the specific scientific methodology that applies to this kind of research is important and needs to be understood.

An example may be an AVHFS engaged in research about fatigue risk in the engineering population via a university, or an AVPSY conducting research about decision-making of pilots within an airline.

Another example would be research of AVHFS and AVPSY on the impact of remote tower operation on the acceptability, usability, (mental) workload, situational awareness, teamwork, stress, and fatigue of air traffic controllers.

## 8. Common Supporting Core Skills & Attitudes

#### 8.1. Taking a Systems Approach to AVPSY & AVHFS Work

It is understood that aviation is a complex 'system of systems' and that change in one part of the system will affect other parts of the (functional) system, including humans. We understand that the context of our work within the system is important. We are mindful of this in all our work and seek to collaborate and share best practice, goals, findings, and outcome, across teams, organisations, and industries.

#### 8.2. Evidence-based Approach & Critical Evaluation and Analysis

Data, rational thinking, critical evaluation, and analysis as core skills and are used to ensure that we continue to deliver evidence-based practice and noticeable and tangible results for our stakeholders from management to operational staff. We re-evaluate and refresh these skills frequently as part of continuous professional development.

# 8.3. Robust Processes, Structure and Logic in scope, Design, and Implementation of Work Activities

In line with using critical evaluation and analysis, we ensure that a robust process, structure, and logic is used for any interventions or work activities. We can show documented evidence of the way we scoped and considered options for an intervention, provide information about how it was implemented (methods), and document and evaluate the outcome and the success of activities.

#### 8.4. Effective Communication

We understand the importance of effective communication including persuasion, mediation, and effective facilitation. We acknowledge that communication will take many different forms and will be context or purpose dependent, and we strive to be as unambiguous as possible. Some situations will require us to effectively communicate a concern or highlight a risk so that another person is able to make a sound decision, and we accept that we have an important role to play in supporting this work. We acknowledge that communication skills require career-long practice and development.

#### 8.5. Reflective Practice

We acknowledge that regularly reviewing our work and professional conduct and reflecting on our goals, of pursuing learning opportunities and paths for continuous professional development are important. This is an opportunity to consider what we do well in our work and where we can improve our technical or non-technical performance. This will be documented as part of the continuous development process. As AVPSY we use opportunities for regular interaction and supervision with other professionals in our area of work.

#### 8.6. Building and Maintaining a Comprehensive Understanding of Specialist Areas

Aviation work has a very broad scope for both AVPSY and AVHFS, and we acknowledge that we will not all be able to develop expertise in all areas of aviation. Alongside acquiring and maintaining sound knowledge of the wider aviation system, we will seek to develop and maintain specialist knowledge in our chosen areas of practice, and to continue developing this during our careers. This will be documented as part of the continuous development process.

# 8.7. Maintaining an Awareness of Business/Customers and Acting Responsibly to Individuals and Organisations

We are aware that AVPSY and AVHFS will commonly work with dual relationships within or alongside businesses in aviation. We acknowledge that we have a responsibility, both to the person or organisation who trusts us and pays for our services, and to any individuals involved in our work. At times decisions may need to be made in favour of one or the other, and we are aware that we need to assist decision makers to be aware of the needs of both, and both the benefits and risks involved.

#### 8.8. Creativity and Curiosity in the Context of Psychology

It is accepted that creativity and curiosity is useful in continuing a career-long learning goal so that we continue to build and develop our skills during our career.

"Being creative" in the context of psychology refers to "the ability to produce of develop original (unique) work, theories, techniques or thoughts" (American Psychological Association, 2022). "Creativity" is typically related to originality, imagination, and expressiveness. Other components are intrinsic task motivation and a certain level of intelligence. In our work we strive to be creative by producing something that has not been done before bearing in mind that what we come up with must work, be functional and useful in some way.

"Being curious" in this context means to being open for surprising findings in our work and in the work of others. It is important to remain curious about why people and systems behave as they do in our industry, and to learn from situations in which we work. There will not always be an existing or accepted solution or method to deal with an issue, and we will use creative thinking to produce new ideas and solutions. When creating new solutions, we will be mindful of the body of inter-disciplinary scientific work already established and seek to make the best use of existing knowledge when applying it to new solutions. We acknowledge that curiosity and innovation are important and will sometimes need to be balanced with other risk considerations in our work. In keeping with the need for effective communication, we accept that we need to help others in aviation consider these issues clearly.

#### 8.9. Acting in Compliance with Ethical and Legal/Judicial Principles and Laws

We understand that we must apply ethical considerations and principles to our work, and to seek guidance if the ethical situation is uncertain. We show respect to personal and cultural differences and respect the integrity of personalities in our work. Confidentiality rules and principles are respected. We recognise the limits of our own expertise and experience, and do not take on work for which we are not qualified.

A range of ethical and legal frameworks binds both AVPSY and AVHFS. Some of these will be dictated by European standards, international agencies like EASA or ICAO, or professional bodies such as or EuroPsy and some will be national regulations.

We are aware that some countries have licencing requirements for psychologists or human factors specialists or specific accreditation schemes. We acknowledge that it is our responsibility to know and understand which regulations we must adhere to and to remain familiar with them if they change.

EAAP has published their own Code of Professional Practice (CoPP) available on the EAAP website (<u>www.eaap.net</u>).

## 9. List of Competencies for Competency Assessment

The following section describes the competencies categorised regarding comprehensive understanding of human, approaches and methods, transverse core competencies and aviation-specific competencies, as are required for different areas of practice (AoP).

In each description, the following notations are included: **M** = **Mandatory**, **R** = **Recommended**, **N/A** = **Not Applicable**. These indicate whether the competencies are mandatory, recommended or not applicable to AVPSY or AVHFS considering accreditation.

## 9.1. Global Aviation-System/Domain Knowledge

#	Title	Short Description	Knowledge	Skills	Attitudes
9.1.1	Knowledge of aviation operator tasks and working environments operational principles, technologies & future evolutions	Acquisition of suitable aviation- specific knowledge and overview of the entire aviation system, for example: Airline and airport operations, flight and airborne systems, ATC, aviation engineering, ground handling, military operations AVPSY: M AVHFS: M	<ul> <li>Know principles of operator's activities, positions, and peculiarities, (jobs, vocabulary, task demands)</li> <li>Know characteristics of operator profiles (e.g., pilot education principles, responsibility for safety, stay vigilant all time, resilience etc.), the motivation, character, and aptitude of applicants</li> <li>Know of the relevant documentation used in operations</li> <li>Know key concepts in aeronautical systems</li> <li>Knowledge of the function and operational use in the operational environment of pilots, air traffic controllers, by engineers etc.</li> <li>Knowledge and understanding of the physical, organisational, technical, and operational aspects in aviation (e.g., how do aircraft and flight function, how do ATC/ATM organisation's function, maintenance, ground handling)</li> <li>Basic understanding of aircraft engineering,</li> <li>Basic understanding of aircraft engineering,</li> <li>Basic understanding of Air Traffic Control role in air safety and traffic efficiency</li> <li>Basic understanding of engineering documents, aviation technical specification, aviation training documentations, aviation procedures for normal and non-normal situations,</li> </ul>	<ul> <li>Technical understanding</li> <li>Human-system / human- automation understanding</li> <li>Keep in mind the future evolution of operators and the operator environment</li> </ul>	<ul> <li>Openness and interest in new developments</li> <li>Be motivated to immerse and/or train in the aeronautical world</li> <li>Consider the moral sense of safety</li> </ul>

#	Title	Short Description	Knowledge	Skills	Attitudes
9.1.2	Knowledge about relevant Aviation regulation, rules of application standards, and recommended practices	This includes a thorough knowledge of current and updated regulations as published by international and national authorities (ICAO, EASA/EC/EU, CAA, FAA) including rules of application, standards (e.g., aircraft certification standards) and recommended (best) practices and guidance material and acceptable means of compliance as published by industry bodies such as IATA, EUROCONTROL, IFATCA, IFALPA etc., that govern the fields of application of APSY and AHFS AVPSY: M (AoP) AVHFS: M (AOP)	<ul> <li>Broad understanding of the regulatory and organisational framework at international and national level of civil aviation including regulatory functions (EASA, NSAs)</li> <li>Understanding the rulemaking structures and procedures in force at various levels</li> <li>Thorough understanding of the differences between binding regulation, implementing rules, applicable standards, and norms, recommended practices, means of compliance and non-binding guidance material</li> <li>Specific knowledge about mandatory (legislative) operational requirements relevant for aviation personnel and aviation safety including operational licensing, medical requirements, training etc.</li> <li>Knowledge on where to find related acceptable means of compliance material (GM), Standards and Recommended Practices (SARPs).</li> <li>Knowledge about new and changed regulatory requirements and standards</li> </ul>	<ul> <li>Being able to adapt to the regulatory context (different usage of regulations in different countries civil vs. military, different perspectives e.g. manufacturer vs operators)</li> <li>Locating and sharing regulatory requirements relevant and applicable for the area of practice (e.g., Part-ARO, Part-MED)</li> <li>Identifying and applying best practices, norms, standards in your area of practice</li> <li>Complying with/ encouraging compliance with relevant regulatory requirements</li> <li>Promoting reasons for rules and regulations (why it makes sense to follow the rules with a light or aviation safety)</li> </ul>	<ul> <li>Flexibility to adapt to operator, manufacturer, country regulatory perspective.</li> <li>Commitment to respect and comply with applicable legal requirements</li> <li>Follow a rule- and standards-oriented approach in development of working procedures</li> <li>Attitude towards improving the way in which rules and regulations are reasonably applied in practice - identifying gaps or inconsistencies in rules and standards</li> <li>Avoid/ discourage complacency and blind rule following; strive towards understanding the reasons behind the rule and why it makes sense to follow</li> </ul>
9.1.3	Understanding Aviation language (terminology)	Understanding the colloquial language (terminology, abbreviations etc.) of people that AVPSY and AVHFS work with is essential to optimizing human performance and safety. Learning the aviation technical language (incl. ATM, Maintenance and Operations) is highly recommended to all AVPSY & AVHFS. AVPSY: M (AoP) AVHFS: M (AoP)	<ul> <li>Knowing the main elements of the aeronautical communication (ICAO phonetic alphabet and numbers, morse code, light signals, military interception signalling, and standard phraseology)</li> <li>Knowing aviation technical terms including ICAO airport codes, Aviation call-signs, main aircraft types and manufacturers and their nicknames (e.g., B747=jumbo, British Airways=Speedbird) will demonstrate competence, increase trust of aviation clients, and reduce misunderstandings</li> <li>Basic knowledge in aerodynamics and aircraft design, being able to name parts of the aircraft, functioning of systems etc.</li> <li>Basic knowledge of the operational procedures applicable to the area of practice and their relevant specialized language and terms.</li> </ul>	<ul> <li>Using the ICAO phonetic alphaber (alpha, bravo, charly) and numbers (zero, one, two, tri, niner etc.) (in communications with pilots and other aviation personnel</li> <li>Being able to understand standard phraseology, ideally having completed a radiotelephony certificate</li> <li>Being able to speak and understand aviation technical terms (e.g. Aviation call-signs, aircraft nicknames, ICAO airport designators, runway directions compass rose etc.)</li> <li>Able to explain psychology/Hit terms in easy language so operational staff can understand (e.g., airmanship, groupthink etc.)</li> </ul>	<ul> <li>Open to continuous learning, being assertive, when in doubt</li> <li>Being able to explain technical terms in aviation psychology and HF in a language operational staff can understand</li> <li>Generating trust by speaking operational language, so aviation personnel open and addresses issues</li> </ul>

### 9.2. Knowledge About Humans\*

#	Title	Short Description	Knowledge	Skills	Attitudes
9.2.1	Basic education in psychology Basic education in a subject aligned to HF including a post- graduate qualification	Manage the application of knowledge, skills and attitudes based on psychology to ensure a positive impact on safety, quality, efficiency, health and security, and balancing individual and other stakeholders' interests. AVPSY: M AVHFS: N/A Manage the application of knowledge, skills and attitudes based on a human factors-related discipline to ensure a positive impact on safety, quality, efficiency, health, and security; and balancing individual and other stakeholders' interests. Note: Psychology is often considered to be part of the HF discipline, for the purposes of EAAP competency evaluation it is treated as a separate field to allow for the two endorsements to be defined. AVPSY: N/A AVHFS: M (AoP)	<ul> <li>Five years of university study in Psychology including the following scopes:</li> <li>General psychology,</li> <li>Neuropsychology,</li> <li>Psychobiology,</li> <li>Cognitive psychology,</li> <li>Differential psychology,</li> <li>Social psychology,</li> <li>Developmental psychology,</li> <li>Personality psychology,</li> <li>Work and organisational psychology (AoP),</li> <li>Clinical &amp; Health psychology (AoP)</li> <li>Psychopathology (AoP)</li> <li>Professional roles may be described as: Clinical or Industrial / Occupational Psychologist, Company</li> <li>Psychologist or Performance Psychologist, Human Factors Specialist/Lead, Human Performance Specialist, Human Systems Engineer, Researcher, Investigator,-</li> <li>These roles may work for a range of organisations such as operators, service providers (ATC), regulators or manufacturers, or may be self-employed.</li> <li>At least a postgraduate degree in an aligned field (For example: Engineering, Physiology, General Human factors or Safety, Medical sciences, or profession specific training such as nursing, physiotherapy, safety management), or professional training alongside a post-graduate degree (e.g., an ATPL and master's degree in HF).</li> <li>Other degrees may be considered on review by the board.</li> </ul>	As defined by EuroPsy. Lunt, I., Peiro, J. M., Poortinga, Y., & Roe, R. A (2015). EuroPsy: Standards and Quality in Education for Psychologists. <i>Hogrefe</i>	Seek continuous professional development in their field of expertise. Be open to the methods and terms used by other disciplines involved in work within the aviation system. Seek continuous professional development in their field of expertise. Be open to the methods and terms used by other disciplines involved in work within the aviation system.
9.2.3	Psychology of Individual Behaviour	Manage the application of principles of humar behaviour to enhance the performance of individuals based on physical or psychologica	Be familiar with the following principles and concepts: f I	<ul> <li>Effectively apply the principles and concepts from the knowledge section (left to specific areas of practice.</li> </ul>	Refer to "Common Supporting) Orre Skills and Attitudes"

#	Title	Short Description	Knowledge	Skills	Attitudes
9.2.4	Psychology of Group and Organisational behaviour	influences while ensuring a balance between humans, tasks, systems, and organisations is maintained. AVPSY: M AVHFS: R (AoP) Manage the application of principles of humar behaviour to enhance the performance o individuals in groups based on physical o psychological influences while ensuring a balance between humans, tasks, systems, and organisations is maintained. AVPSY: M AVHFS: R (AoP)	<ul> <li>Individual Human performance: the role and interaction of cognition, motivation, errors, stressors, fatigue, emergency preparedness</li> <li>Performance of the visual, auditory, tactile &amp; haptic sensory system; and vestibular senses</li> <li>Cognitive functions &amp; cognition: attention / vigilance, perception, information processing, memory</li> <li>Decision making &amp; macro cognition: situatior awareness, problem solving, planning, scheduling</li> <li>Personality</li> <li>Psychometrics: psychological measurement and testing</li> <li>Motivation, volition &amp; action</li> <li>Human learning and training</li> <li>Emotion and emotional regulation</li> <li>(Mental) Workload &amp; stress</li> <li>Be familiar with the following principles and concepts:</li> <li>The origins, features, and impact of human behaviour in groups and teams.</li> <li>Organisational development, structure, design, and influence on people.</li> <li>The dynamics of different types of groups (organisations, societal, working associations,)</li> <li>Understand how the organisation and management attitudes, aptitudes and constraints affect group dynamics.</li> <li>Understand the impact of both environmental and specific characteristics of an organisation on group</li> </ul>	<ul> <li>Explain how individual differences and dynamics arise, and how to manage them.</li> <li>Identify the client and their context, and what actions, interventions or treatment will be most effective for them.</li> <li>Identify systemic HF issues within an organisation, and raise awareness about their impact on individuals, and how to manage the issues.</li> <li>Deal with the specific cognitive, emotional, and motivational demands of operators on individuals.</li> <li>Identify and work with group phenomenon in organisations.</li> <li>Manage the impact of group behaviour.</li> <li>Apply an understanding of group behaviour to organisational activities within aviation.</li> </ul>	Refer to "Common Supporting Core Skills and Attitudes"
9.2.5	Mental Health & Wellbeing	Manage the application of knowledge on menta wellbeing and mental disorders to prevent/ help, treat /support individuals and groups regarding mental health. Practice is based on (clinical) psychodiagnostics and detection of problems, while balancing the protection of the individual's needs and rights and system or organisation's needs. Promoting aviation safety remains a central goal with any psychology intervention. AVPSY: M AVHFS: R (AoP)	<ul> <li>Understanding the signs and symptoms of common mental health disorders or distress.</li> <li>Differentiation between psychological wellbeing and psychological disorders (Only AVPSY)</li> <li>International Classification of Diseases (ICD - 11) by WHO and Diagnostic and Statistical Manual of Menta Disorders (DSM-5) by APA (Only AVPSY Clin AoP)</li> <li>Concepts of psychological instruments for differentia psychodiagnostics (Only AVPSY)</li> <li>Concepts of psychopathology (AoP)</li> <li>Recognising the difference between psychology and psychiatry, and the value of the two roles working together.</li> <li>Potential impact of unresolved psychological issues / disorders on aviation safety and security</li> </ul>	<ul> <li>Conceptualising and conducting education/projects to raise the awareness of mental wellbeing in aviation, with special emphasis on well-being, dealing with stressors and fatigue.</li> <li>Teamwork and cooperation: being part of aeromedical teams/ institutions/ organizations/ associations where AVPSY can work on the implementation of (clinical) psychology part in documentation/rules and regulations, with the final aim of contribution to aviation safety.</li> <li>Application of psychological instruments for differential psychodiagnostics, interpretation of the results in accordance</li> </ul>	Refer to "Common Supporting Core Skills and Attitudes"

#	Title	Short Description	Knowledge	Skills	Attitudes
			<ul> <li>Principles/ concepts of stress (anxiety and pressure)</li> <li>Concepts / principles of fatigue and burnout.</li> </ul>	<ul> <li>with ICD or DSM standards and acting according to the proposed aeromedical regulations.</li> <li>Close professional cooperation and communication with AMEs.</li> </ul>	
9.2.6	Human Physiology	Manage the application of knowledge on human physiology to enhance performance and well- being while ensuring a balance between humans, tasks, systems, and organisations is maintained. AVPSY: M (AoP) AVHFS: M (AoP)	<ul> <li>Knowledge of physical characteristics such as metabolism, muscle, circulatory and respiratory system, nervous system, vision, hearing, physical stress sleep, and body rhythms (AVHFS)</li> <li>Anthropometric, biomechanics, work physiology (AVHFS)</li> <li>Knowledge on effects of sound / noise, vibration temperature and humidity, illumination, contrast and colour, atmosphere on human performance (AVHFS)</li> <li>Knowledge on workstation design: displays, controls input devices, human-computer / human-automation interaction (AVHFS)</li> <li>Knowledge on neurophysiology and principles of design</li> </ul>	<ul> <li>Awareness of the impact of physiology on human performance in an aviation context</li> <li>Providing advice to mitigate/ anticipate the effect of the aviation and organisational environment on individuals and their performance, based on best practices, scientific literature, and relevant regulations</li> </ul>	Refer to "Common Supporting Core Skills and Attitudes"

#### \*Additional information for understanding the human

Visual sensory system: Vis. Environment, reception, anatomy, processing, performance aspects: Colour, light, optics, acuity, contrast, night vision, sensory/cognitive processing, and performance (depth / spatial perception, visual search, detection, discrimination), influence on cognitive performance and emotion, individual differences

Auditory sensory system: Amplitude, frequency intensity, loudness, pitch, sensory/cognitive processing, and performance (detection/localisation, speech recognition, noise impacts, masking..., individual differences) (HF/AP) Vestibular senses: Functions/ principles/concepts – (for aircrew, space environment, individual differences)

Principles/ concepts of cognitive functions & cognition: attention/selective/divided attention, mental workload, task sharing, perception, working memory, long-term memory (limits, implications for design of workplace) Principles/concepts of Decision Making: Types of decisions, situation awareness, planning bias in DM, Situational Awareness, measuring, avoiding/mitigating human bias, problem solving (principles, troubleshooting, human error), planning Concepts / principles of fatigue: vigilance, arousal, sleep disruption, deprivation, circadian rhythm; understand impact of fatigue for aviation operators (shift work), tools to manage fatigue at work (FRMS) Principles/concepts of Motivation: alienation from the job - people at a certain time in their career seem to 'drift away' from the centre of their industry and organisation. Losing the dedication to the job and the motivation required to sustain and stay focused.

Concepts / principles of Stress: Types of stressors (environmental, psychological, life-stress, workload induces stress), impacts of stress on performance (mental, physical, short-long-term impacts...), stress measurement (physiological measures, other), stress re-mediation, physical / mental stress alleviation)

Concepts / principles of Workload: task load, timeline, overload, (mental) workload measurement, re-mediation and avoidance, human and performance impacts

Concepts/principles on teams and groups: Social psychology of groups; behaviour, crew/team performance, communication, decision making

Group/Crew/Team oriented training & development: communication, teamwork, trust, team coordination/collaboration, training / interventions methods - TRM/CRM/coaching, conflict mediation Human-Machine Interface: Technical and operational aspects including people issues to better understand what operators face

Human adaptability to change: Shift roster / schedule changes, airspace changes, procedural changes, changes in the Controller Working Environment / working position, management changes.

(Clinical)-psychological questions/mental health & wellbeing: Concepts of behaviour, appearance, communication, speech, mood, thinking, perception, sleep, cognition, thought content, judgment, significant life events and insight. Verbal / non-verbal. Deficit / disease / disorder; Abuse of psychotic, stress-related or somatoform disorder; Psychotic disorder; Schizophrenia, schizotypal or delusional disorder; Abuse of psychotropic substances; Mood disorder; Personality or behavioural disorder; depression, anxiety, panic attack, insomnia, etc.), psychological conditions, patient/client, clinical report. AME/psychiatrist, aeromedical team, to self-report, to report, (privilege of) licence, sick leave, fit - unfit, suspension, release, semi-annual / annual aeromedical examinations, qualifying and disqualifying, requirements, prevention, confidentiality, communication, medical documentations, regulators and regulations - medical parts, diagnosis, treatment plan, hospitalization, counselling, psychotherapy, International Classification of Diseases (ICD - 11) by WHO, Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by APA, medications (e.g. antidepressants), risk assessment, support, help, cure, safety, health, Critical Incident Stress Management (CISM), Class 1 and class 2 medical certification. AP and peer supporters based on relevant training)

#	Title	Short Description	Knowledge	Skills	Attitudes
9.3.1	Human in System/ overarching methods	Identify, decide, design, explain and implement the most adequate methodological approach to achieve the expected objectives AVPSY: M AVHFS: M (AoP)	<ul> <li>Solid methodological background and knowledge on qualitative, quantitative research method, research design, sampling, measurement, data collection, evaluation, and analysis</li> <li>* Extensive knowledge of relevant literature and evolution of the methodology of the discipline</li> </ul>	<ul> <li>Form and implement a strategic or technical approach</li> <li>Select a practical approach and understance how to apply the knowledge in company</li> <li>Search AVPSY/AVHFS competences depending on the type of studies</li> <li>Speak an operational and systems language and tie own language in the middle</li> <li>Oversee HF input into design / procedural changes for the organisation</li> </ul>	<ul> <li>Be open and take the problem larger than only on psychology (for example psycholinguistics)</li> </ul>
9.3.2	Validation/ Measurement	Identify, decide, design, explain and apply adequate methods, tools, and measurements AVPSY: M AVHFS: M	<ul> <li>Knowledge on methods, tools &amp; measurement such as for example (not all items and mandatory): <ul> <li>System evaluation methods (heuristics cognitive walkthrough, usability testing in-service-evaluation),</li> <li>Study design (sampling, one factor multiple factors, within / between subjects, mixed); depending on validation-phase (exploration verification, validation) - measuremen &amp; data analysis, statistical / logica conclusion (statistical / practica significance), type I / II error communicating results) (HF)</li> <li>Root cause analysis, Timeline analysis Task analysis</li> <li>* Knowledge of sequential acciden models, epidemiological models and system accident models, risk, and hazard models</li> </ul> </li> </ul>	<ul> <li>Identify suitable tools depending on the design phase, scope, and requirements (e.g., regulatory, temporal demand) of ar expected study</li> </ul>	<ul> <li>Maintain a curious and sceptical attitude to methods, tools, and measurement.</li> <li>Continue to investigate the science around new methods and continue to consider existing methods critically to promote continuous improvement.</li> </ul>
9.3.3	Observation & Interviews	Ability to gather information by interviewing and observations in clinical (anamnesis), and industrial settings AVPSY: M AVHFS: R	<ul> <li>Principles, role and scope of the interviewer, the interview and observations for different questions and contexts (clinical vs. actuarial prediction simulations, selection / intake interview in work settings, such as operations, and in research studies)</li> <li>Influences and biases in interviewing and observation</li> </ul>	<ul> <li>Adapt depending on question and context</li> <li>Apply and demonstrate the knowledge or conducting the interviews and observations</li> <li>Focus on details (key verbal and non-verbal Ability to observe</li> <li>Ability to differentiate routine vs non-routine /critical situations</li> <li>Ability to follow and lead the flow of the assessment towards the key information</li> </ul>	<ul> <li>Ethical behaviour</li> <li>Empathy</li> <li>Structure of the work</li> <li>Being flexible and open- minded</li> <li>Synthesize the information</li> <li>Strong focus on details</li> <li>Attention</li> <li>Being professional, strong borders</li> </ul>

#	Title	Short Description	Knowledge	Skills	Attitudes
			<ul> <li>Reliability and validity of interviews information processing; combining document analysis and interview</li> </ul>	<ul> <li>Ability to create pleasant atmosphere with the aim to raise the spontaneous responses and behaviour</li> <li>Comparison: congruent or incongruent information</li> <li>Ability to transcribe interviews</li> <li>Ability to analyse interviews (qualitative and quantitative content analysis)</li> <li>Ability to speak the language of the interviewee (e.g., pilot, ATCO, cabin crew)</li> <li>Ability to perform post-observational interviews / debriefing</li> <li>Synthesize collected data</li> <li>Produce the report</li> </ul>	<ul> <li>Critical thinking and the ability to analyse the information, select and differentiate the important from non-important information</li> <li>Being mentally present and self-aware</li> </ul>
9.3.4	Study Design/Experimental laboratory studies	Ability to conduct adequate experimental /studies AVPSY: M AVHFS: M (AoP)	<ul> <li>Know which experimental designs exist (field study vs. laboratory experiment., independent/dependent/control variables, univariate versus multivariate, factorial design, designs for small sample sizes, random assignment)</li> <li>Knowledge of measurement statistics, statistical vs. practical significance, measurement error, generalisation, prediction &amp; error)</li> </ul>	<ul> <li>Design a protocol that allow a thorough conclusion</li> <li>Interpret outputs</li> <li>Recognise when experimental design i adequate</li> <li>Prepare, conduct, analyse and report o experimentations (e.g., real-time simulations in ATC, cockpit, air/ground coupled evaluations)</li> <li>Laying out the validation strategy, the validation plan, and the final validation report</li> </ul>	<ul> <li>Maintain a scientific mindset and curiosity about study design</li> <li>Critical thinking</li> </ul>
9.3.5	Job and Task Analysis	Including defining a job domain/ role, job descriptions and advertisements, creating performance appraisals, breakdown of a complex task into component tasks to identify different knowledge, skills and attitudes needed. Commons methods include Hierarchical task analysis, job demand surveys, cognitive/item tasks analysis, task inventories. For details on job analysis for air traffic control please refer to a recent review paper (Wium & Eaglestone, 2022) AVPSY: M (AoP) AVHFS: M (AoP)	<ul> <li>Knowing history of job analysis and mair findings for aviation personnel (e.g., civi vs. military ATCOs, pilots, engineers etc.</li> <li>Knowing commonly used job and tasl analysis methods in Aviation (Fleishmar Job Analysis Survey, Critical Inciden Stress Technique, cognitive tasl analysis, role modelling etc.)</li> </ul>	<ul> <li>Being able to conduct a high-quality job and task analysis using scientific methods and validated instruments</li> <li>Being able to draw conclusions and interpreting results in the context or relevant norms</li> <li>Being able to select the most efficien methods depending on project objective (design, training development, etc.)</li> <li>Understanding how a hierarchical or cognitive task analysis could be used to support a learning development plan training plan, or change management plan or work'</li> </ul>	<ul> <li>Complying with scientific standards in conducting job and task analysis</li> <li>d</li> <li>f</li> <li>f</li> <li>t</li> <li>s</li> </ul>

#	Title	Short Description	Know	ledge			Skills		ł	Attitu	ıdes
9.3.6	Statistics/ Data Analysis/ Modelling	Application of adequate statistical studies AVPSY: M AVHFS: R (AoP)	•	Quantitative vs. analysis Univariate vs. mult Working knowledg SPSS; statistical an methods for deali size vs large survey Understand different tory analysis and of Recognise when adequate or not experimental desig Understand princi statistical/logical of	qualitative tivariate statisti ge of package alysis; know ade ing with small s ys and "big data ence between e lata fishing statistical meth t depending o gn ple of significan conclusion	data cs equate sample a" explora hod is on the ce and		Apply statistically correct an depending on data and method	nalysis	•	Keep in mind the need to understand humans when dealing with statistics Critical thinking: realise when statistics is wrong, or wrong supply is used for the data Data-mindedness (a lot of people choose psycho because it is philosophical and they don't like to treat data; physio is not the same, they are more used to data; we need more people who are data-minded)
9.3.7	Training	Application of educational activities aiming to enhance the knowledge, skills, behaviour, and attitude of aviation personnel to (better) perform specific tasks AVPSY: M (AoP) AVHFS: M (AoP)	•	Understanding and learning and instru- methods, process Understand impact reflection, mental on learning Knowledge of app aviation as a key group/team perfo Understand transfipractice Understanding eff an awareness dynamics which performance.	d knowledge or uction methodo to of motion models, and em olying HF princing factor for indive rmance fer of knowledge fective facilitation of common may alter	n adult plogy / vation, notions ples in idual / ge into ge into group group		Design / develop training / instru modules Implement and conduct training Perform training evaluation Develop and apply presentatio instruction skills	uction	•	Being empathetic / have a desire to support trainees to perform Being clear in expression Being structured and demonstrating professionalism Being flexible and adaptable to trainee level of knowledge / understanding

## Other methodological Approaches & Tools

#	Title	Short Description	Knowledge	Skills		Attitudes
9.3.8	Psychometrics & too development	Application of specific methodologies and processes of developing new, valid, and reliable tests and measures o performance, attitudes, skills, or abilitie and or to improve existing ones fo objective, fair and effective selection, o placement of people to specific jobs and tasks AVPSY: M AVHFS: N/A	<ul> <li>Understanding human capabilities are behaviour; and how to assess are measure them</li> <li>Understand job and task requirements of human cognitive / physical / emotion factors</li> <li>Knowledge of qualitative / quantitative methods and measurement</li> <li>Knowledge of methods for item and test scale design, development, validation</li> <li>Knowledge of advanced statistical analysis</li> <li>Knowledge of systematic bias(es)</li> <li>Understanding of concepts and methomethomethomethomethomethomethometho</li></ul>	nd Perf nd Deve Conc anal al for r Appl ve evid valid / Dem deve	form job analysis velop, test, and select items/ scales nduct test trials, perform statistical alysis to provide statistical evidence reliability and validity of test scores ply correct methods to establish dence for criterion (job) performance idity monstrate practical benefit of using veloped solution	<ul> <li>Being research-minded</li> <li>Being systematic and paying attention to detail</li> <li>Develop creative solutions</li> <li>Protect-against-systematic bias(es) in selection</li> <li>Use professional judgment when evaluating data</li> <li>Take account of psychometric and practical considerations</li> <li>Working across disciplines</li> </ul>
9.3.9	Individual Diagnosis & Treatment	Application of specific diagnosti knowledge and skills counselling/therapeutic knowledge theories, and techniques to support and help the individual in need AVPSY: M (AoP) AVHFS: N/A	<ul> <li>Knowledge of the principles of managing clinical diagnosis: setting, clinical interview, clinical tests.</li> <li>Knowledge of qualitative and quantitative data interpretation.</li> <li>Comprehensive knowledge and understanding of the concepts of psychological instruments for differential psychodiagnostics.</li> <li>Comprehensive knowledge of Internationa Classification of Diseases (ICD - 11) by WHC and Diagnostic and Statistical Manual of Mental Disorders (DSM–5) by APA.</li> <li>Knowledge of psychotherapeutic approach (e.g., psychoanalysis, cognitive-behaviour, transaction analysis, systemic approach, etc.)</li> </ul>	<ul> <li>Dem thro conc</li> <li>Critic</li> <li>Focu</li> <li>Anal conc</li> <li>Com patie</li> </ul>	monstration of the knowledge ough the application of tests and nducting clinical interview. tical thinking. cus on details. alysis of collected data; Make a nclusion and write a report mmunication skills - with the cient/client and AME (psychiatrist);	<ul> <li>Ethical behaviour</li> <li>Empathy</li> <li>Synthesize the information and make a treatment prediction and progress</li> </ul>

#	Title	Short Description	Knowledge	Skills	Attitudes
9.3.10	Peer Support	Applicationofspecificdiagnosticknowledgeandskillscounselling/therapeuticknowledgetheories, and techniques to support andhelp the individual in need.AVPSY: R (AoP)AVHFS: N/A	<ul> <li>Knows principles of psycho- diagnostical assessment (interview, observations, battery of tests) and psychotherapeutic support.</li> <li>Tight collaboration (liaison) with AME and/o psychiatrist.</li> <li>Peer Support: (trained to provide support in crisis):</li> <li>Knowledge of the most common psychological issues among aircrew</li> <li>Knowledge of the psychologist and psychiatrist jobs and their differences</li> <li>Knowledge of the intervention in crisis knowledge of the structure of peer suppor call.</li> </ul>	<ul> <li>Demonstrates the application of psycho-diagnostic assessment and integration of the results.</li> <li>Decision making and plan of the treatment: further psychiatric interventions, diagnosis, psychotherapy/counselling/developme ntal support.</li> <li>Peer Support:         <ul> <li>Demonstrates basic listening an counselling skills</li> <li>Demonstrates the structure of the talk call; application of the interventions i crisis, awareness, and the application o setting the boundaries.</li> </ul> </li> </ul>	<ul> <li>Being empathic.</li> <li>Being open-minded.</li> <li>Being flexible and tolerant.</li> <li>Having no prejudices, no judgment.</li> <li>Being calm and patient.</li> <li>Attention to details.</li> <li>Being self-aware.</li> <li>Continuous path of self-analysis and self-development.</li> <li>Self-confident.</li> <li>Practice mindfulness.</li> </ul>
9.3.11	Competency Assessment	Ability to identify, apply and support in practice the knowledge and effectiveness of organisations and people to accomplish organisational change and performance regarding operators' competencies AVPSY: M (AoP) AVHFS: R (AoP)	<ul> <li>Know / understand methods to asses competence</li> <li>Understanding and knowledge of competency standards</li> <li>Understand the complexity of functional systems in aviation</li> <li>Understand critical competencies about risks, hazards, safety, and efficiency</li> <li>Understand the critical conditions affecting human performance in decision making and resolving situations</li> <li>Knowledge of systematic bias(es), reliability validity and objectivity in development and application of assessments</li> </ul>	<ul> <li>Analyse the job context, processes, an procedures as the basis for assessment</li> <li>Identify relevant cognitive/ physical emotional requirement expressed behaviour / performance</li> <li>Apply professional judgement based o evidence and valid observation, data and measurement</li> </ul>	<ul> <li>Protect against personal bias(es) in assessment</li> <li>Seeking fairness in conducting assessment</li> <li>Being objective and applying professional judgement</li> <li>Checking judgement against valid evidence</li> <li>Being aware of sources for bias and reduced levels of objectivity</li> <li>Being systematic and strictly follow established best practice rules</li> </ul>
9.3.12	Personnel recruitmen & selection	tApplication of processes, practices, and tools in human resource management to acquire or retain people that best fit the demands of the tasks, jobs and the (operational) environment according to their mental (psychological) strength behaviour, and personality to meet the operational (safety) demands, and the goals and objectives of the employing organisation. Please refer to the EAAP Handbook or Selection (Eaglestone et al., 2022) AVPSY: M (AoP) AVHFS: R (AoP)	<ul> <li>Know/understand principles, methods processes, and tools to select and recrui aviation (operational) personnel</li> <li>Understand psychometric quality standards</li> <li>Understand R&amp;D methods of tes construction and validation of selection methods</li> <li>Knowledge / understanding of the mental psychological, physical, behavioural, and personality demands in the operational wor environment (from job / task analysis)</li> <li>Understand the mathematical and statistical methods for scoring, cut-offs, composites in selection decision making and recruitment</li> <li>Understand selection decision making failure and principal error types</li> </ul>	<ul> <li>Apply psychometric standards an methods in test composition for specific candidate groups</li> <li>Conduct selection studies and trials</li> <li>Apply appropriate mathematica methods to establish test score / composites</li> <li>Design appropriate methods for selection decision making</li> <li>Collect and store candidate test and appropriate personal data for subsequent validation studies</li> <li>Collect / use appropriate criterion dat (training / simulator data, jo performance, observation scales)</li> <li>Apply appropriate data protection</li> </ul>	<ul> <li>Seeking fairness in testing / decision making</li> <li>Appreciating diversity of candidates</li> <li>Being aware of sources for bias and reduced levels of objectivity</li> <li>Being systematic and strictly follow established best practice rules in testing, interviewing, and selection decision making</li> <li>Follow and appreciate the technological, operational, and organisational developments in the work environment / working positions of personnel</li> <li>Ethical behaviour</li> </ul>

#	Title	Short Description	Knowledge	Skill	s A	ttitudes
9.3.13	Organisational design and development	Ability to identify, apply and support in practice the knowledge and effectiveness of organisations and people to accomplish organisational change and performance regarding organisational design AVPSY: M AVHFS: R (AoP)	<ul> <li>Understanding / knowledge of principal values, structures, design, and culture of organisations and business, and operational context / environment (incl. management structures, management methods/style: leadership)</li> <li>Understand development of organisational business, managerial strategy, and plan</li> <li>Understand the high risk / reliability contex at organisational, technical, and operational (work floor) level (in aviation)</li> <li>Understand the social, psychological and H aspects in individual, teamwork, and departmental performance</li> <li>Understand principles, methods of performance and change management</li> <li>Principles /concepts in organisational cultur and social norms (social dialogue representation culture, negotiation bargaining culture, just culture and statiability, job design/motivation, jo satisfaction)</li> <li>Different types of organisations / procedure in operational environment and i management; management levels structures, and functions</li> </ul>	al of al nt es, al, al, al, al, al, al of re / aff ob es in ls,	<ul> <li>Apply methods in organisation design, management, leadership, personnel, performance and project management, work organisation and work schedule</li> <li>Conduct analysis of data / info from documents, workshops, brainstorming sessions, interviews, observations, surveys, questionnaires at organisational, group, and individual level</li> <li>Provide feedback and input to strategy, design, and development</li> <li>Develop or advise on specific methods and tools at various organisational levels</li> <li>Advise / apply on methods and approaches in management of change</li> <li>Identify weak points in company's processes and procedures; working environment; relationship among staff members.</li> </ul>	<ul> <li>Being systematic and structured in the approach</li> <li>Show a clear, unbiased, and competent attitude to organisational issues</li> <li>Demonstrate stability and 'standing' in dealing with critical situations at all organisational levels</li> <li>Be knowledgeable and keep overview of processes and steps and the continuous developments at management and organisation level</li> <li>Be flexible and adaptable to changes</li> <li>* Be able / competent to shape and influence the course of developments at organisational levels</li> </ul>
9.3.14	Design & Validation of Systems, Tasks & Operations	Ability to set-up, produce and report the application of psychological and HF knowledge in system/task/operations design and validation Note. This is only possible in companies involving AVHFS and AVPSY in change management/ production tasks. In companies that do not engage AVHFS and AVPSY this could imply to train up engineers, human resources agents or other role on human factors design. <b>AVPSY: M (AoP)</b> <b>AVHFS: M</b>	<ul> <li>Know approaches to explore, validate an verify new ways of working and design aligned with regulations and standards</li> <li>Know engineering models (V&amp;V Agile Sprint)</li> </ul>	nd ns	<ul> <li>Integrate AP &amp; HF with system engineering to ensure adequate timing and added value</li> <li>Make sure that the human operator is well considered for the design and use of the product, but also during the production phase</li> <li>Translate ideas of the designer to be compatible with human behaviour</li> <li>Make explicit what the human needs along the design (from the need analysis to operators or production), make diagnostics on the coupling between human and machine on the problems to address, and accompany the design until the end to evaluate how it will be assessed, based on human characteristic</li> <li>Validate new ways of working, new technology</li> </ul>	<ul> <li>Devoted to technological evolutions</li> <li>Interested in the relationship between humans and machines and in building an equitable relationship</li> <li>Keep the future in mind</li> </ul>

#	Title	Short Description	Knowledge	Skills	Attitudes
9.3.15	Human Factors in Safety Management Systems (SMS)	Application of HF risk assessments investigations, audits, surveys, and interpret the results in a safety management context, AVPSY: R (AoP) AVHFS: M (AoP)	<ul> <li>Knowledge of the integration of human factors risks in safety management systems, HF in safety audits, HF in safety investigation, normal operations safety surveys, HF risk assessments, HF safety case</li> <li>Understand the link between HF risk and overall safety performance</li> </ul>	<ul> <li>Perform a HF risk assessment,</li> <li>Build a HF safety case,</li> <li>Perform a root cause analysis highlighting HF issues,</li> <li>Perform a HF investigation and giving HF recommendations</li> <li>Perform a HF audit/ normal operations safety survey</li> </ul>	<ul> <li>Belief that the human factor is part of a larger system design, and that behaviour is influenced by the system design</li> <li>The human is only as good as the system in which he/she works</li> <li>Consider HF as most important asset in the organisation</li> <li>Anticipate that humans and systems are never perfect</li> </ul>
9.3.16	Methods for Psycho- physiological Assessment	Application of specific methodologies based on psychophysiological measures (ECG, EEG,) <b>AVPSY: R (AoP)</b> <b>AVHFS: R (AoP)*</b> *Note that depending on the specific method used, join work with a trained physician or doctor may be required.	<ul> <li>Principles of psychophysiological and neurophysiological measures (ECG, EEG, etc.)</li> <li>Common tools for of data collection</li> </ul>	<ul> <li>Know how to collect and analyse psychophysiological data</li> </ul>	<ul> <li>Maintain curiosity about the scientific properties of assessment tools and their continued improvement.</li> </ul>
9.3.17	Change & Transformation / Culture / organisational Wellbeing / Coaching	Application of measures to support transformation & change AVPSY: R (AoP) AVHFS: R (AoP)	<ul> <li>Comprehensive understanding / knowledge and experience of:</li> <li>Processes, drivers, enablers, conditions social / psychological /organisational impacts of (organisational / technical , operational) change</li> <li>Conditions, complexity and dynamics o change and transformation processes</li> <li>Organisational development, leadership and management culture and relation to change / transition</li> <li>Methodology, tools, and approaches o management of change</li> <li>Principles of performance management</li> <li>Training on principles of coaching and shor forms of counselling</li> </ul>	<ul> <li>Participate and contribute to strateging planning, diagnosing, and implementing change at organisation / corporate level</li> <li>Organise and conduct workshops hearings, meetings, interviews etc. a various levels</li> <li>Diagnose / analyse/ assess / evaluate strength / weaknesses (SWOT) at variou levels</li> <li>Apply methods and tools at individual group organisational level (coaching training, moderation, team development)</li> <li>Participate and support social dialogue partnership</li> <li>PM (Performance Management): staff assessment, internal and external evaluation</li> <li>Wellness: conducting short forms o counselling with the aim e.g., o overcoming performance limitations o development of tolerance (to specifilifestyle, shift work) or mediation in the conflict situations among the staff.</li> </ul>	<ul> <li>Positive attitude to change</li> <li>Being participative and involving</li> <li>Sensitive to dynamics, social, psychological factors in motivation and response (resistance / acceptance)</li> <li>Being communicative, cooperative, flexible, and adaptable in the approach</li> <li>Being visionary in finding solutions</li> <li>Being sociable, objective, and fair</li> <li>Being professional</li> <li>Being ethical</li> <li>Being open-minded</li> <li>Being patient and flexible</li> </ul>

#	Title	Short Description	Knowledge	Skills	
				•	Collected data integration, evalua and prediction based on the practice and literature knowledge Negotiation skills. Leadership skills.
9.3.18	Safety Climate and Just Culture Assessment	Application of measures for (safety and just) culture in an organisation and development of a (safety and just culture) action plan to improve, measure behaviour changes as success criterion Keywords: Culture assessment / development (safety, security, just culture, organisational culture, management culture, reporting culture) AVPSY: R (AoP) AVHFS: R (AOP)	<ul> <li>Knowledge about the difference between culture and climate - culture is based on underlying assumptions, values, beliefs, attitudes of operational staff at work, it is their personal reality and not the ideal world, people behave in line with their values and beliefs, it is difficult to change culture</li> <li>Knowledge about different cultures (safety, security, just culture, management culture, organisational culture etc) elements/ facets of a safety and just culture</li> <li>Understanding of safety culture as broader element of organisational culture and management commitment,</li> <li>Methods to assess safety and just culture</li> <li>Knowledge about safety culture action /</li> </ul>		Perform safety and just cu assessments Develop action plans improve and design interventions promote safety and just cu awareness and change attitudes, be and behaviour of operational staff
			<ul> <li>Knowledge about safety culture action / development plans and interventions to improve safety and just culture, link to safety culture as enabler for effective safety</li> </ul>	, ,	

	Attituc	les
ation best		
lture to to lture liefs,	•	Maintain curiosity about how the work on Safety Culture continues to develop, and how it can be best applied to the aviation industry.

## 9.4. Areas of Practice (AoP)

#	Title	Short Description	Knowledge	Skills		Attitu
9.4. 1	Regulations & Standards	Manage the application of rules and standards at the level suitable for the field of application AVPSY: M (AoP) AVHFS: M (AoP)	<ul> <li>Understand rules and regulation pertaining to assigned AP work tas and why they exist (e.g., aeromedica safety, operations, design,)</li> <li>Basic aviation regulation knowleds (ICAO, EASA, NAA)</li> <li>Know of the sources and criteria for selecting suitable / applicable standard depending on the context of use</li> <li>Know the key national / internation and European organisations regulatory institutions and the relevance for AP and HF</li> <li>Know the legal basis for applying huma factors/health &amp; safety technic information and how this is deployed safety critical situations (i.e., durin incident enforcement work)</li> </ul>	ns (s (l, (e or ls al / n al n g	Analytical skills (e.g. identification of legal regulatory deviations in the structures, processes, o practices of the worl environment) Planning and development skil (e.g., compliance activitie based on regulations & standards) Collaboration skill (collaboration skill (collaboration with authorities/regulators i required by position o assignment (i.e., during safety audits)	, r k II s k s n f r y
9.4. 2	Scientific Research	Manage the application of knowledge, skills and attitudes based on psychological discipline to efficiently achieve expected targets in research AVPSY: R (AoP) AVHFS: R (AoP)	<ul> <li>Know research methodologies (e.g., interview, observation, questionnaire, focus groups, literature review)</li> <li>Knowledge of applied research methodologies in aviation like developing and implementing researcc plan, selecting appropriate research design and models, data analysis and result presentation, scientific report writing</li> <li>Know the principles of scientifi approach for psychological research ar its transformation into the aviatio context</li> <li>Understand the organisational conte of research projects (e.g., contra based, limited degrees of freedor organisational strategies impactin individual research possibilities)</li> <li>Know where to find relevant research outputs &amp; literature sources</li> </ul>	• • • • • • • • • • • • • • • • • • •	Skills in adapting the application of human science and research methodology to aviation Capability to face critical questions why "More research in needed" Competence in providing research / scientific facts as bes answers to real world problems whilst acknowledging that the solution may be associated with some level of uncertainty Maintain links to the research community Keep updated on curren research trends to apply evidence-based practices	n i i s s t ; e n h t y

#### ıdes

Rigorousness in respecting and following regulations and standards Being analytical and systematic in diagnosing legal and regulatory aspects of the work environment

Questioning mind-set Confidence and conviction in science and research as a basis for progress in aviation Innovative thinking

#### HANDBOOK ON AVIATION PSYCHOLOGY & HUMAN FACTORS COMPETENCIES

#	Title	Short Description	Knowledge	Skills	Attitu
9.4.3	Design and Evaluation of systems, technologies, jobs, and/or organisational structures	Depending on the AoP, the appli	cation of competencies on two. Human, 3. Metl	nod & Approaches and 5. Common Supp	orting
9.4.4	Individual/Group/Organisational Behaviour and working environments (incl. CRM/TRM/MRM, non-technica skills (NOTECHS), organisational, impact of stressors, social and behavioural psychological principles, influence on culture)				
9.4.5	Management of Change & Transformation / Culture / organisational Wellbeing / Coaching				
9.4.6	Human Performance & Safety: risk assessment, incident & accident investigation, human error, safety management,				
9.4.7	Workforce Management recruitment, selection, training design, Competency Assessment & evaluation, leadership & management influence,	- - - - - -			
9.4.8	Influencing human performance and reliability physiological and psychological features, sensory and cognitive functions including decision making				

## udes

g Core Skills and Attitudes is adapted

#	Title	Short Description	Knowledge	Skills	Attitudes
9.5.1	Communication	Effective verbal and written communication AVPSY: M AVHFS: M	<ul> <li>Understand the need of adapting communication to the level and role of interlocutor.</li> <li>Understand existing communication models and styles</li> <li>Understand the facilitation value in communication and persuasion.</li> <li>Knowledge of concise and precise factual report writing</li> </ul>	<ul> <li>Awareness of the impact of communication on different interlocutors.</li> <li>Apply facilitation and moderation techniques</li> <li>Apply active / emphatic listening</li> <li>Concise, precise, and articulate speaking</li> <li>Presentation, persuasion, and negotiation skills</li> </ul>	<ul> <li>Self-confidence</li> <li>Openness and attention</li> </ul>
9.5.2	Reflection, Evolution & Openness	Reflective Practice/Continuous Learning & Openness AVPSY: M AVHFS: M	<ul> <li>Understand the need for reflective practice and continuous learning</li> <li>Understand that knowledge is not fixed over time</li> </ul>	<ul> <li>Searching for and use of results from research and development to improve specialist's activity</li> <li>Implement / adopt best practice from R&amp;D</li> </ul>	<ul> <li>Openness to new developments</li> <li>Critical thinking</li> <li>Being knowledgeable</li> </ul>
9.5.3	Systems Approach	Taking a systems approach in the practical application of work methodology to solve problems AVPSY: M AVHFS: M	<ul> <li>Understand the need for a systems approach to improve system safety, (human-system) performance, individual well-being, and problems solving</li> <li>Appropriate formulation of problems in aviation applied sciences and development of effective strategies to resolve them</li> <li>* Understanding functional systems in aviation as a combination of organisation, humans and (sociotechnical) components</li> </ul>	<ul> <li>Encourage and apply a systems approach throughout any areas of practice</li> <li>Analytical skills</li> <li>* Problem-solving skills</li> </ul>	<ul> <li>Openness to new developments</li> <li>Critical thinking</li> <li>Being knowledgeable</li> <li>Analytical and systematic thinking</li> </ul>
9.5.4	Collaboration with other disciplines	Collaboration and links across disciplines AVPSY: M AVHFS: M	<ul> <li>Understand that Human Factors and Aviation Psychology are interdisciplinary disciplines needing developing a network of trained peers</li> </ul>	<ul> <li>Interdisciplinary collaboration</li> <li>Be connected in networks</li> </ul>	<ul> <li>Cooperative</li> <li>Team worker mind-set</li> </ul>

#	Title	Short Description	Knowledge	Skills	Attitudes
9.5.5	Business/Customer Mindset	Maintaining awareness of the customers business objectives of and responsibility to individual, operational, organisational, and management considerations. AVPSY: M AVHFS: M	<ul> <li>Knowledge of operational context in Aviation, understand the workplace of aviation staff and know the biggest risks in their workplace, know how to gain acceptance by operational staff</li> <li>Knowledge of the complex human relationships, including attitudes and motivation, in sociotechnical structures for an effective business outcome</li> <li>Knowledge and understanding of the business, organisational and management objectives / interests of the aviation system and of the different parties involved</li> </ul>	• • • •	<ul> <li>Organisational analytical and diagnosis</li> <li>Organisation /</li> <li>Balancing between individual and organisational benefits</li> <li>Self-confidence</li> <li>Being flexible</li> <li>Planning and counselling (management)</li> <li>Group facilitation</li> <li>Focus attention to the user with the objective to provide a more usable system</li> <li>Balanced sensitivity towards customers</li> </ul>
9.5.6	Creativity and Curiosity in applied psychology/HF	Apply psychological techniques and methods to generate creativity and curiosity in the workforce, provide examples of techniques and their advantages and pitfalls AVPSY: R AVHFS: R	<ul> <li>Knowledge about methods/ techniques to help operational staff to understand different perspectives from different roles/ responsibilities in the organisation, know the benefits of creativity and curiosity at work/ in the workforce</li> </ul>	•	<ul> <li>Set impulses to seek new information/experiences and explore novel possibilities in the work force through applying psychological interventions and techniques</li> <li>Facilitate creativity (brainstorming, going for a walk, mental training, mindfulness etc.)</li> <li>Value the contribution of each staff member to the overall objective/ performance</li> <li>Keeping up to date with the novelties in the field</li> </ul>
9.5.7	Effectively scoping, designing and implementing psychological interventions or work activities	Apply a psychological intervention for a specific issue (e.g., team- related issues, fatigued staff, underreporting) aiming to decrease or prevent operational accidents/ incidents/ errors <b>AVPSY: M</b> <b>AVHFS: M*</b> Note. This implies training on specific tools allowing to give solutions to HF analysis, beyond just HF principles.	<ul> <li>Knowledge on how to transfer results from psychological assessments into recommendations and psychological interventions,</li> <li>knowledge about evidence-based interventions (collect data/ know your facts), knowledge about predicting behaviour, knowledge about pitfalls of psychological interventions (effect of the experiment, lab conditions etc.)</li> <li>Know the importance of a baseline and control group in experimental design</li> </ul>	•	Scope, design and implement a psychological intervention in a certain work context (e.g., cockpit, cabin, maintenance)

#	Title	Short Description	Knowledge	Skills	Attitudes
9.5.8	Ethics and Legal/Judicial competencies	Manage psychological activities based on suitable ethical principles and legal background, AVPSY: M AVHFS: M	<ul> <li>Know principles of ethical standards and professionalism and understand the need for adherence to ethical standards (i.e. in aviation people can be killed by wrong applications) Have basic legal knowledge and know how psychology is anchored in the juridical system (e.g. right to refuse giving evidence, labour right) as grey zones exist, and once needs to be able to take responsibility when hiring, such as:         <ul> <li>Laws on liability, civil and criminal law, national and international laws</li> <li>Understand relevance of professional indemnity insurance</li> <li>knowledge about European Just Culture policy &amp; principles and European mandatory reporting policy</li> </ul> </li> </ul>	<ul> <li>Make sure approaches are correctly used</li> <li>Know how to stick to one's guns to be able to represent ethical rules in organisations, as pressure may exist to produce certain results</li> <li>Know how to promote adherence to ethical standards</li> </ul>	<ul> <li>Confidentiality</li> <li>Approachability</li> <li>Integrity</li> <li>Honesty</li> <li>Having ethical behaviour</li> </ul>
9.5.9	Critical evaluation & analysis (evidence-based practice)	Rational thinking, critical evaluation, and analysis as core skills and are used to ensure that we continue to deliver evidence-based practice and noticeable and tangible results for our stakeholders from management to operational staff. We re-evaluate and refresh these skills frequently as part of continuous professional development. AVPSY: M AVHFS: M	<ul> <li>Know that decisions should be based on the best available, current, valid, and relevant evidence.</li> </ul>	<ul> <li>Know how to integrate best research evidence in your decisions</li> <li>Make decisions based on evidence including transparent line of arguments</li> <li>Rational and critical thinking</li> </ul>	Attitude towards evidence-based practice

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## Appendix A: Advice for Newcomers

EAAP members provide advice to support newcomers entering the fields of practice.

#### 1. FIND YOURSELF SUPPORT

- Identify need for tutorship
- Identify systematic knowledge sources (e.g., intranet, manuals, training)
- Establish meetings with other peers
- Create and maintain a network

#### 2. COMMUNICATE AND COLLABORATE

• Manage relationships between human factors specialists, engineers, project managers and other key stakeholders in your daily job

#### 3. KNOW THE ENVIRONMENT OF YOUR COMPANY

- Make aware of personal aspects of individuals in organisation
- Get to know people
- Make sure being integrated into the organisation and work within all the departments as to gain a full understanding of the company's processes
- Gather awareness on culture (such as national/organizational and professional culture)
- Understand the organization's history and cultural population background
- Understand organisational politics and a deep appreciation for how 'vested' interests shape understanding and culture.
- Gather knowledge on the contractual terms by which staff members are hired; the existence of too much bureaucracy due to the regulation; the relationships among staff members.
- Understand the role of the management, as a system is usually a top-down system
- Understand why there is a discontent in the organisation when employees complain about the organisation
- Understand role of specific employees

#### 4. INTEGRATE WITH THE PROFESSIONAL ENVIRONMENT OF YOUR OPERATORS

- Have good self-awareness and know how to position oneself in the work know, who do you want to be and what opportunities to grow exist in the job.
- Immerse in a partial operational roster (such as flight crew, ATC, ...) to appreciate the challenges and common misperceptions
- Understand operator roles and skills, and how skills are developed.

- Gather first knowledge on operators' roles, systems and how they work. Develop appreciation for what it is really like to fly all hours and times and how this impacts performance.
- Be aware that difficult things cannot be addressed and dealt with or achieved rapidly. One needs a lot of experience and sensitivity to recognise / sense and get a feeling for the environment, the specificities of the job, the organisation, the people, and the entire system. This competence is not quickly acquired.
- Integrate with other professionals in aligned roles, for example AMEs, psychiatrists or safety practitioners.

#### 5. MANAGE THE TRANSITION BETWEEN ACADEMICS AND INDUSTRY

- Be aware of trade-offs that are needed in the industrial world gap between academia and industry is wide and difficult to bridge especially time constraints. For example, there is no endless time to plan and cost and operational constraints exist.
- Use knowledge from scientific world to convert in applicable knowledge for operation.
   For anyone coming to the market, it is important to realise the different types of customers they have and what type of information they need to develop themselves and what others do have as information which one could tap.
- Develop a core understanding of being a 'consultant' first and subject matter expert second. If the AVPSY/AVHFS cannot effectively engage with the staff in the specific environment or adapt to the industry all the skills and knowledge on the planet will not be listened to or sought.
- Demonstrate cost-benefit analyses for the work.
- Work on how to get human factors into design lifecycles early on.
- Support the promotion of acceptance: management often does not accept AVPSY very easily. Acknowledge that AVPSY or AVHFS that hold an aviation licence or certificate and understand the aviation language will find it less difficult to be accepted.
- Recognise that during education people learned a lot of theory, the trick now is how theory is applied in the work environment.
- Recognise not only their own side of the story, but the subject.

## Appendix B: Advice for Employers

A key question for employers of AVPSY / AVHFS is around why it would be useful to hire people with an EAAP endorsement. Those with an endorsement can indicate clearly that they have a specific level of knowledge and experience which is useful to an organisation.

There are many working tasks, in which the work of AVPSY and AVHFS may overlap, and it is important for employers to be clear about the scope of tasks or outcomes they would like to achieve; it is useful to provide this detail in job advertisements to ensure that the most suitable applicants will apply.

It is also important that employees meet any national licencing requirements – these will vary between countries.

The information below next to the information provided in the entire document), may help you to understand the scope of AVPSY.

## A note about scopes of practice for psychologists

As noted in some of the information above, two of the most common branches of psychology to be employed in Aviation are Clinical and Occupational Psychologists. There is no separate endorsement within the AVPSY category for clinical or occupational psychologists, although the benefit in explaining the broad differences in scope of practice for each one was considered.

For those employing an AVPSY, it may be important to distinguish which professional skill set is most suitable or appropriate for the work at hand. The following describes the two broad categories:

**Occupational Psychologists** look at the behaviour of people within a working (operational) context.

They may be involved in activities such as recruitment and selection, (non-clinical) psychological behaviour assessment (surveys etc.) and performance improvement programs (e.g., fatigue risk management, team resource management), organisational / task- and job design and development, training, safety and risk management, safety and just culture assessment, accident and incident investigation and prevention, supervision, and management of organisational change processes and more.

Their predominant goal is safety of the overall aviation system and operational processes and prevention of operational errors and occurrences.

Occupational psychologists are likely to work in a variety of teams in the aviation industry. They may be employed as part of safety, investigation, human resources, science, or stand-alone teams. Their expertise is broadly around the human elements of occupational systems and processes, with more of a 'business' focus than clinical psychology. Some occupational psychologists offer coaching and counselling based on their continuous development and education. In this context they are involved in the area of wellbeing and mental health (however, they are not involved in diagnosis and treatment of mental health issues). **Clinical Psychologists** are involved in the diagnosis and treatment of mental health issues.

The American Psychologists Association defines Clinical Psychology as "the psychological specialty that provides continuing and comprehensive mental and behavioural health care for individuals and families; consultation to agencies and communities; training, education, and supervision; and research-based practice. It is a specialty in breadth — one that is broadly inclusive of severe psychopathology — and marked by comprehensiveness and integration of knowledge and skill from a broad array of disciplines within and outside of psychology proper. The scope of clinical psychology encompasses all ages, multiple diversities, and varied systems."

Clinical Aviation Psychologists should be able to apply specific diagnostic knowledge and skills, as well as counselling or therapeutic knowledge, theories, and techniques to conduct mental health assessments and therapeutic intervention and support to help aircrew (or other aviation workers/personnel) in need. Their predominant goal is aviation safety, not only the safety of individual clients. Therefore, additional knowledge of the principles of aviation medical regulations, licensing and medical certification is required. A Clinical Aviation psychologist should be a mandatory member of the aeromedical team, ensuring close collaboration with the aeromedical examiner and aeromedical psychiatrist.

Clinical psychologists should know the principles of conducting clinical diagnostics: clinical setting, clinical interview, clinical battery of tests; knowledge of qualitative and quantitative data interpretation; comprehensive knowledge and understanding of the concepts of psychological instruments for differential psychodiagnostics; comprehensive knowledge of International Classification of Diseases (ICD - 11) by WHO and Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by APA; knowledge of treatment procedures; knowledge of psychotherapeutic approach (e.g. psychoanalysis, cognitive-behaviour, transaction analysis, systemic approach, etc.).

Both clinical psychologists and occupational psychologists are involved in peer support programs. Although non-psychologists will work as peers (for example pilot peers), they will be well trained on the limits of their skills. They will understand clearly where and when they can intervene, and the limits of their competence. They will be informed about the impact of trauma and how to provide psychological first aid and will be culturally sensitive in the application of their interventions.

## Appendix C: Application for Competency-based Accreditation (Survey)

This form was handed out as electronic pdf – form during the trial phase (June-Sep 2021).

In the meantime, the new competency-based accreditation scheme has been fully implemented in the EAAP accreditation scheme. For details please refer to www.eaap.net/accreditation.

#### Accreditation Survey Preview

## Accreditation Type\* —

- I wish to apply for:
- Aviation Psychologist (AVPSY)
   Aviation Human Factors Specialist (AVHFS)

#### - Reason for Accreditation\* -

- I seek accreditation for: (multiple choice possible)
- Professional recognition
- Employer requirement
- Client requirement
- Career development
- Other (enter your response below)

#### Other Reason for Accreditation (optional)

I seek accreditation for:

#### Overall competency level (optional)

Based on my current knowledge, skills and attitudes in aviation psychology or aviation human factors , I self-rate my overall competency level at:

- O Level 1 basic knowledge and comprehension
- O Level 2 specialist / practical application of skills
- O Level 3 supervision of practical skills

#### – My highest scientific degree\* –

Please indicate your highest scientific degree.

- O Bachelor's degree (BSc.)
- O Master's degree (MSc.)
- O Doctoral degree (PhD.)
- O Student (degree in progress)
- O No scientific degree

#### – My academic background\* —

I hold a scientific degree in. Multiple choice possible

- Psychology
- Human Factors
- Other discipline (e.g. philosophy, medicine, law, economy)

#### **Competency Statement (Example)**

[Providing an example of work which illustrates how you meet the competencies in your scope of practice]

I have used examples of my work below to demonstrate how I have applied the competencies:

In 2017 I worked on a multi-disciplinary team within ABC responsible for recommending a new aircraft to replace the Boeing 747 in our fleet. I work within a team of both occupational and clinical psychologists, and we work closely with medical and human resources teams. For this project, I additionally sought advice from a physiologist expert on cockpit design (illustrating **communication and collaboration**).

I adopted a **systems approach** to this project, engaging with external experts and all internal stakeholders who would need to work with the aircraft. We used a STAMP analysis and mind mapping to consider whether there were elements of the system, which we had not thought to include, and a FRAM analysis of the current operation to understand what may change within the system with the new aircraft.

I was conscious of several constraints on the project, including the limited budget available for adjusting any aircraft purchased, and the need to minimise cross-training for existing flight crews. In this way I maintained a **business mind-set**, while looking at the possibilities that would provide the most benefit fir ABC airline.

I maintained my **curiosity** about options for the new project and spend time acquiring knowledge and information about cockpit design and decision-making schemes for pilots, to support my work on the project. I contributed to a clear project timeline which helped to keep the project on-track, and to help with requirement setting for the aircraft selection criteria. These **scoping** activities assisted with followon tasks such as training design for operation of the new aircraft.

At the conclusion of the project, we ran a 'lessons learned' session where I encouraged the team to share relevant information which would assist us in making our corporate performance better in similar situations. As an example, we realised that in previous similar situations the engineers and ground handlers had not been involved in the requirements setting for choosing a new aircraft. Including their specialist knowledge helped to pre-empt some equipment and servicing issues that we had not foreseen and had a substantial benefit in allowing these processes to run more smoothly when the new aircraft was introduced.

Throughout the project, I was aware of my **ethical boundaries** as an aviation psychologist, and regularly sought advice from colleagues with specific specialist advice where this was appropriate (e.g., the physiologist).