CANSO SAFETY

CANSO STANDARD OF EXCELLENCE IN HUMAN PERFORMANCE MANAGEMENT

SHAPING OUR FUTURE SKIES

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Contents

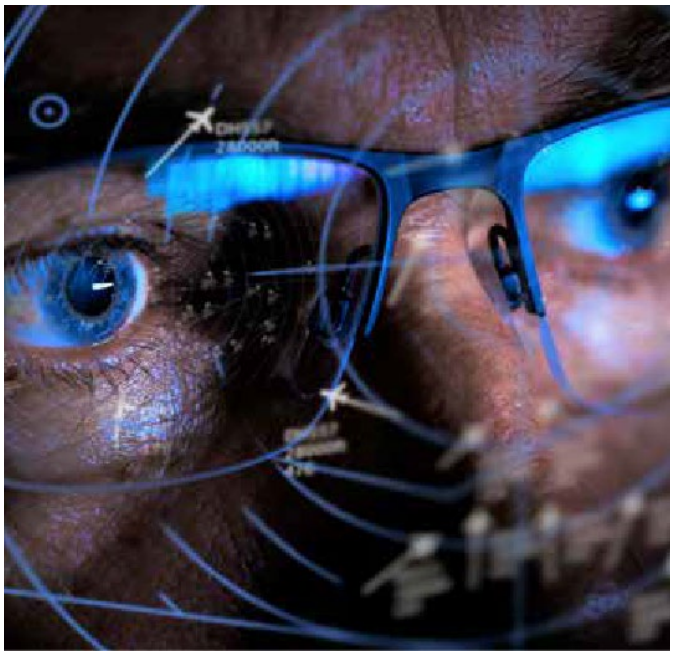
Introduction and notes on update

The *CANSO Standard of Excellence in Human Performance Management* helps air navigation service providers (ANSPs) assess, develop and improve their human performance management. It is based on a human factors white paper developed by EUROCONTROL, FAA and CANSO Members, and is in line with the *CANSO Standard of Excellence in Safety Management Systems*.

The HPM Standard of Excellence was originally published in 2019. Since then, many Air Navigation Service Providers have used the approach to implement management structures and solutions aimed at improving human performance management across their organisations. This has led to many inquiries to the Human Performance Management Workgroup across a broad range of topics. Taking into account this feedback, the decision was made to update this document and include new definitions, guidance and methodology to assist CANSO members in making the most out of their maturity assessments.

Ultimately, all ANSPs, no matter their size or resources can make a start in understanding their human performance capabilities and how it is managed. This updated document aims to help everyone make a start.

The Human Performance Management Workgroup is available to CANSO members to assist in making a start in the SoE assessment.



Why is a human performance management programme necessary?

To deliver a safe, efficient and effective air traffic management (ATM), it is essential that controllers, maintainers and others operate at an optimal level of performance. It is people that control aircraft, it is people that maintain equipment and it is people that create safety. Good human performance is therefore required to deliver good air traffic management.

The ATM system is interactive and complex, operating in a continually changing environment. At a time when new technology and procedures are being introduced with greater reliance on automation, a high level of performance from the humans in the system has never been so important.

Traditionally, the focus of human performance has been on, for example, incident investigation, recruitment, training or equipment design. Each of these has been addressed by different departments within an organisation. While this isolated approach continues to deliver good human performance, it is also important that all areas that contribute to human performance are managed at a programme level, in an integrated manner. This is because each area is connected and this connection needs to be managed.

Fundamentally the technical and social aspects of air traffic management are changing. There are moves to implement more automation and Artificial Intelligence (AI) tooling as well as to integrate new air space users in the coming years. This will require leaders to understand human performance in new and dynamic ways. Leaders must engage in the human performance perspective not only to implement these changes, but to deliver them in a meaningful and sustainable way to the people who remain at the core of our network and operations.

The reality is that Human Performance (HP) exists everywhere in the operations and our organisations and by mapping and understanding who and where it is being managed, a broader perspective can be achieved with the goal being that Human Performance (HP) is able to be managed more efficiently and the best choices on investment in developments can be achieved.

Understanding Human Performance and Human Factors Together

The key distinction between **Human Performance (HP)** and **Human Factors (HF)** lies in their scope and focus. Human Factors refer to any factor that affects and contributes to human performance. It is a multi-disciplinary field encompassing psychology, engineering, industrial design and operational research. Human Factors also focuses on understanding the interactions among humans and other elements of a socio-technical system, applying principles, data and methods to design and evaluate systems. Human Factors can be thought of as the 'how' we deliver or achieve human performance.

In contrast, The ICAO Manual on Human Performance (Doc 10151) defines **Human Performance (HP)** as the capabilities and limitations of human beings that impact the safety and efficiency of aeronautical activities. This definition emphasises the role of humans in contributing to overall system performance within the aviation industry. It integrates various aspects of human factors to ensure safe and effective operation by considering human abilities, characteristics, and limitations in the design of equipment, environments, and jobs within the aviation system.

Human Factors are not static, but exist within an active socio-technical system that responds to demand throughout continuous adjustments. Human Performance is a key moderator of system success. Thus by focusing on Human Performance as an outcome, and designing the human factors through human-centred design approaches as well as actively monitoring and managing the elements of human performance, this can allow ANSPs to optimise the overall system performance.

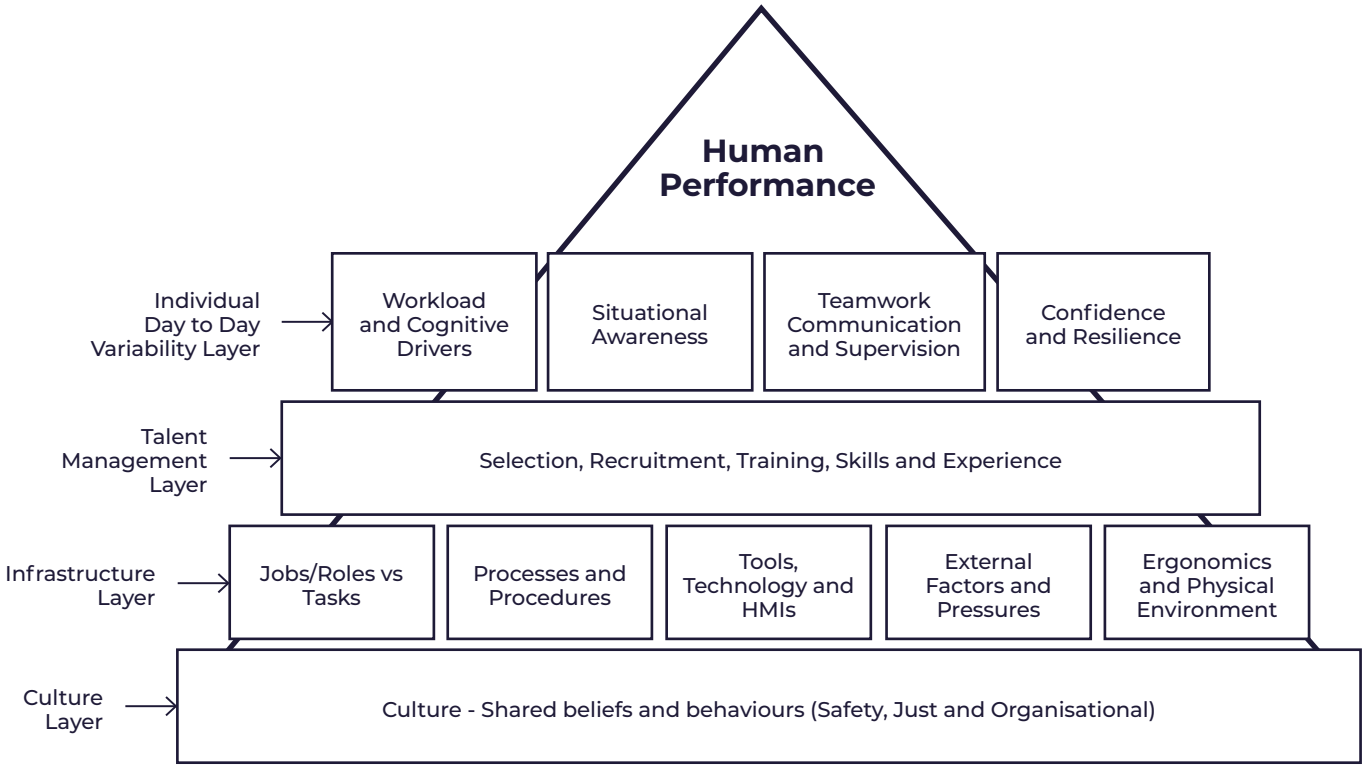


Figure 1 – Human Performance Pyramid (Vink & Walzl, 2024)

Understanding Human Performance and Human Factors Together (continued)

To understand the output of human factors, **human performance can be thought of as the sum of all contributing human factors in each situation**. Human performance should be the goal of all engineered human factors, a concept understood by experts but often limited to individual factors like usability and task-load success. For example, we often see over investment in recruiting, and under investment in user-centred design. This means we sometimes have an imbalance in the amount of success of overall performance because expertise is focused on the wrong areas.

One way ANSPs can understand this is by using the framework shown in Figure 1, which represents the relationship between human factors and human performance. This model evolved from NASA's early 2000s human performance studies, which linked human performance to socio-technical systems (Hooey & Foyle, 2007), and was further developed by Air Navigation Service Providers (ANSPs) like Eurocontrol and NATS (Clark et al., 2008).

The **Human Performance (HP) pyramid** emphasises that achieving optimal Human Performance requires the integration and monitoring of multiple layers of human factors within a socio-technical system. The pyramid consists of four levels: **cultural, infrastructure, talent management,** and **individual day-to-day variability**. Each layer contributes to the overall human performance in distinct but interconnected ways. Human Factors are represented by the individual boxes in the pyramid. Taken together, they contribute to optimising human performance outcomes.

Scientific evidence overwhelmingly suggests that investment in the bottom layers (culture and infrastructure) significantly improves human performance compared to investment in individual performance, coaching and even recruitment or training (Johnson & Avers, 2008) because of the universality of good cultural and infrastructure design in promoting the best humans can achieve.

The **cultural layer** forms the foundation, encompassing the shared beliefs and values of an organisation that influence behaviors and decision-making. A strong safety or performance culture is critical for sustaining high levels of HP, as it guides how operators prioritise and manage their tasks.

The **infrastructure layer** focuses on the design and alignment of job roles, tools, processes, and environments. It involves ensuring that systems and procedures support human operators effectively, reducing the likelihood of human error and enhancing usability. This layer ensures that the physical and cognitive work environments are optimised for performance.

Talent management, the third layer, emphasises recruiting, selecting, and training the right individuals with the necessary skills and experience. It ensures that the right people are in the right roles, with ongoing development and support to maintain their capabilities. This layer is vital for ensuring that operators can handle complex tasks and adapt to dynamic situations.

At the top of the pyramid is **individual day-to-day variability**, which recognises that human performance fluctuates due to factors like workload, fatigue, stress, and situational awareness. Monitoring these individual factors in real-time helps organisations adjust operations to maintain high performance and prevent errors.

Achieving optimal **Human Performance** requires the careful orchestration of all these layers. It is not enough to focus on individual factors; organisations must bring them together in a considered and proactive manner, continuously monitoring and adjusting them. By doing so, organisations can not only enhance system performance but also ensure safety and resilience in complex operations.

To achieve the highest human performance in an organisation or operation requires a carefully considered human performance management programme that is linked to the safety and performance outcomes of the entire operation and organisation. By using the pyramid as a guide, organisations can also assess which Human Factors might be inhibiting advances in overall performance and may wish to place this pyramid at the centre of their human performance strategies or programmes for use as a problem-solving tool.

Building a Human Performance Management Programme

Which elements should a Human Performance Management programme contain?

Traditional performance areas such as selection, training, wellbeing and teamwork are all important to the provision of a safe, efficient and effective ATM. However, areas such as the design of the tools and equipment, procedures used, and leadership within the operations room are also important. As a result of reviewing best practice within ATM and across other safety-related industries, 12 elements of human performance have been identified and addressed by the *CANSO Standard of Excellence in Human Performance Management*.

Since 2019, we have conducted benchmarking and understanding of these elements and observed where and how organisations invest in the different elements. Our study into the Global state of Human Performance Management in air navigation services - CANSO shows where the majority of ANSPs focus on. But other shifts in the past few years have demonstrated the need to view these 12 areas holistically and part of a broader management system. For example, the COVID-19 pandemic demonstrated the need for Health and Well-being to be given just as much priority as perhaps other areas such as Operational Procedures. But additionally, the focus on the design of our concepts of operations (CONOPS), especially around increasing automation and engineering services, has meant that many ANSPs are investing more in the ATM Equipment and Support Tools and also the Impact of Change from a human performance perspective. This is encouraging and by using the 12 HPM areas below, ANSPs can help gauge the maturity of each element and make choices on the utilisation of assets and investment as required to maximise human performance minimise human error.

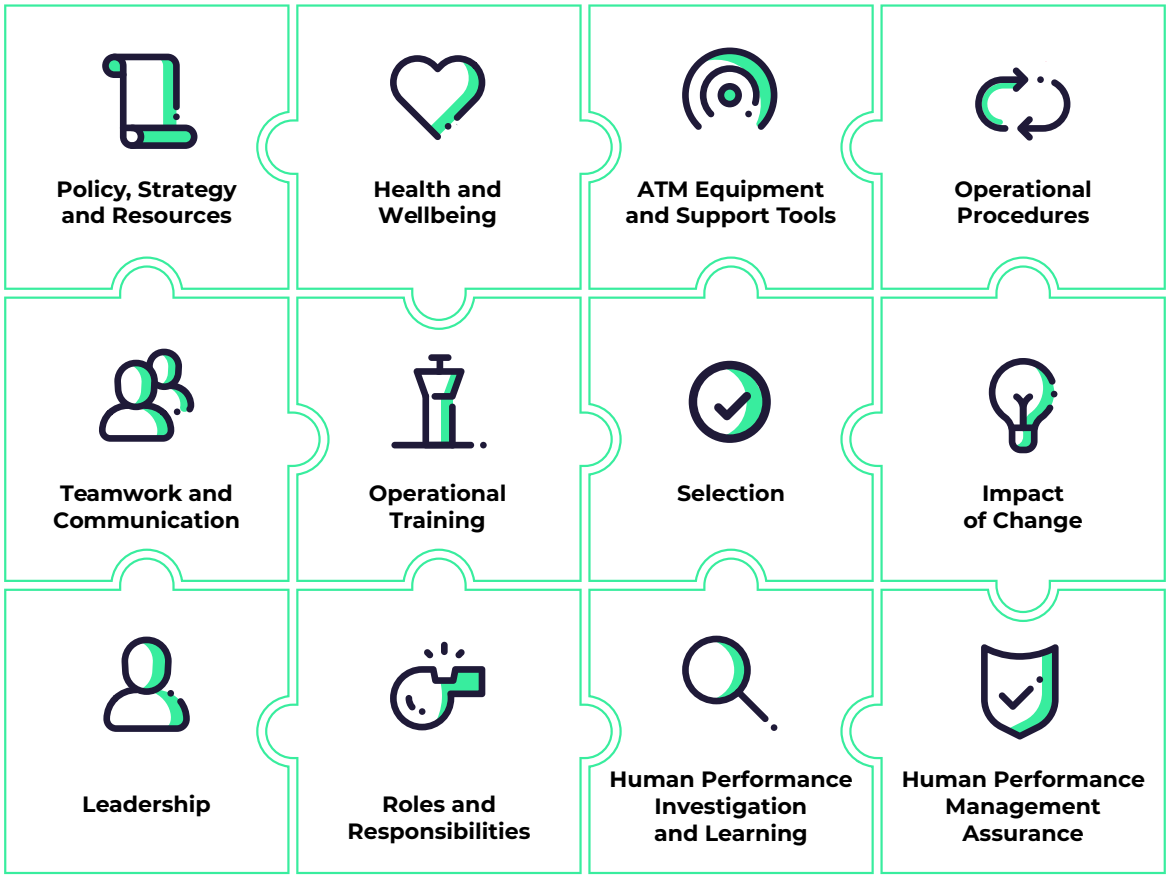


Figure 2 – The 12 elements of the CANSO Standard of Excellence in Human Performance Management.

Building a Human Performance Management Programme (continued)

On which elements should a Human Performance Management programme focus?

For a human performance management programme to be effective, the importance and benefits arising from good human performance have to be recognised at the highest levels in the organisation. The organisation has to recognise that people create safety and that people provide resilience, adaptability and flexibility.

To be successful, a human performance management programme has to be embedded within and support the organisation's policies and strategies, and the appropriate focus and resources have to be provided. Policy, strategy and resources (shown in Figure 1) are therefore a necessary enabler for the provision of good human performance. The objective of this element is as follows:

Policy, Strategy and Resources
To establish a human performance management system which supports the achievement of the organisation's goals.

With this in place, focus can then be put on the next 10 elements of human performance, the key interlinking pieces of the framework. These are:

Health and Wellbeing
To facilitate good physical and mental health and wellbeing of staff across the organisation, including the promotion of robust Fatigue Risk Managment programmes.

Air Traffic Management (ATM) Equipment and Support Tools
To manage human performance requirements during the design, implementation and operation of ATM equipment and support tools.

Operational Procedures
To manage human performance requirements during the design, implementation and application of operational procedures.

Teamwork and Communication
To have an effective exchange of information and safety awareness through teamwork and communication.

Operational Training
To ensure that human performance aspects are incorporated into the design, content and delivery of operational training.

Selection
To ensure that selection incorporates both current and future human performance requirements.

Impact of Change
To identify, analyse and manage the impact of change on human performance.

Leadership
To drive human performance throughout the organisation through ownership, direction and implementation.

Roles and Responsibilities
To ensure that roles are defined and responsibilities are fulfilled with respect to human performance management.

Human Performance Investigation and Learning
To identify strengths and weakness related to human performance. To share and implement lessons learnt across the organisation.

Building a Human Performance Management Programme (continued)

These 10 elements are likely to be managed by different departments across the organisation. To obtain a high level of human performance, all 10 elements have to be considered and managed in an integrated fashion across the organisation because the different elements have an influence on each other.

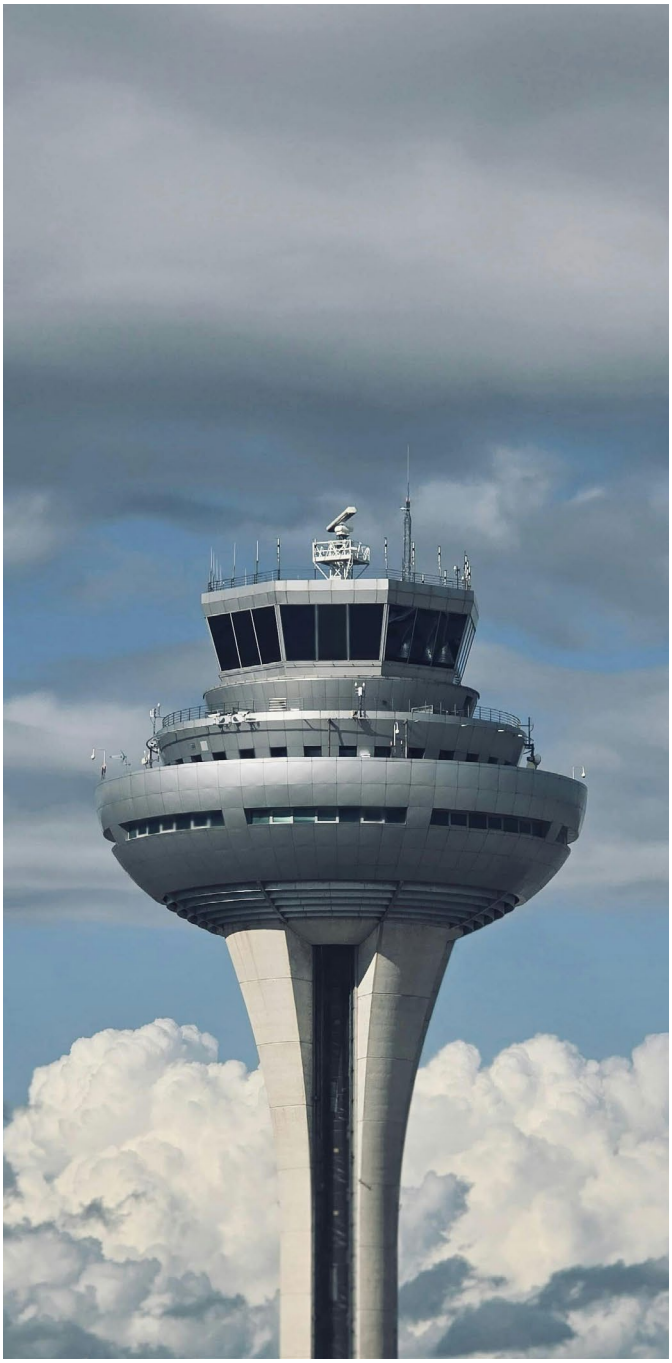
For example, when implementing new ATM equipment and support tools or new operational procedures, the operational training of controllers and maintainers needs to be considered. The impact of the change on the users and operators also needs to be taken into account. The implementation of the change could result in new or different roles and responsibilities and this may require adjustments to be made to the training of current controllers and the selection of future controllers who may need different skills. Successful implementation and operation of the change will require good leadership. Investigation and learning will need to take account of how the new equipment or procedures are being used and this will include consideration of teamwork and communication. Finally, the health and wellbeing of the controller or maintainer has an impact on their human performance which may be a contributing factor to the incident.

What this illustrates is that all 10 elements are interlinked and the full picture of human performance only emerges when all pieces are in place.

The final foundation element of the human performance management programme is assurance. By managing human performance as a programme rather than as individual elements, this final element ensures that decision makers have the assurance that human performance is being managed effectively and delivering business and safety benefits.

Human Performance Management Assurance
To provide assurance that human performance management is effective.

In the Annex to this document, we take time to expand and explain these 12 elements even further based on the latest science and feedback from the CANSO members. At any stage, when learning and understanding these 12 elements, the Human Performance Workgroup can be contacted for an introductory meeting and the provision of assistance in beginning the SoE assessment. This is part of the CANSO service and is available to all members. Please contact: **safety@canso.org** to be connected to the HPM team.



Excellence in Human Performance Management

What is a human performance management standard of excellence?

A human performance management standard of excellence sets out the requirements against which an ANSP can assess themselves and, where appropriate, define improvement activities to obtain an increased level of maturity. For the CANSO Standard of Excellence in Human Performance Management, this takes into account each of the 12 human performance elements identified.

The levels of maturity in the CANSO Standard of Excellence in Human Performance Management are the same as those used in the CANSO Standard of Excellence in Safety Management Systems.

The levels of maturity increase from Level A to Level E where each level is described as follows:

Level A – Informal Arrangements
Human performance management processes and/or requirements have not been agreed at the organisation level – they are either not routinely undertaken or depend on the individual assigned the task.

Level B – Defined
Human performance management processes and/or requirements are defined but not yet fully implemented, documented or consistently applied.

Level C – Managed
Human performance management processes and/or requirements meet the required regulatory standards and comply with relevant ICAO Annexes. Human performance management processes and/or requirements are formally documented and consistently applied.

Level D – Assured
Evidence is available to provide confidence that human performance management processes and/or requirements are being applied appropriately and are delivering positive, measured results.

Level E – Optimised
Human performance management processes and/or requirements set international best practice, focusing on innovation and improvement. The effectiveness of the human performance management improvement actions are measured and evaluated against defined improvement criteria.

The Human Performance Management Maturity Scheme is represented in the Figure 3.

Figure 3 – Human Performance Management Maturity Scheme.

Implementing a Human Performance Management Programme

Managing the 12 elements of the Human Performance Management programme, commonly owned by different parts of the organisation, may require significant effort and co-ordination. The *CANSO Standard of Excellence in Safety Management Systems* is designed to identify key priority elements as a first step and focus implementation activities on these elements. The focus is on identifying areas for improvement that directly benefit the organisation. This will demonstrate value from improving human performance and provides a strong foundation for implementing further actions within your organisation.

It is recommended that **Policy, Strategy and Resources** is considered first. This element sets the foundation for the organisation's human performance management programme and all the other elements are enabled by it. It is important to reach at least Level B of this element as this reflects a maturity level where an ANSP can identify priorities and the resources available. This strategic understanding of human performance enables the development of a plan for establishing a human performance management system.

To identify its priorities for human performance, an organisation should then consider the next 10 elements. Each organisation will need to decide which of these 10 elements to focus on first and this will depend on:

a) what it already has in place
b) what resources it has available
c) the priorities within the business

Starting with a small number of elements first is more beneficial than trying to address all 10 at the same time. Nevertheless, in the mid-term, it is important that all 10 elements are considered because of the interdependencies between them. Improving one element can only go so far without consideration of the other elements that interact with it.

If an organisation is unsure about where to start, it is suggested that the two elements of **ATM Equipment and Support Tools,** and **Human Performance Investigation and Learning** are a good starting point. Addressing the former is a proactive way to improve human performance while the latter provides a better understanding of current human performance and where improvements are needed.

An organisation should try to achieve at least Level B for each of the 10 elements rather than increasing some elements to a higher level while leaving others at Level A. This will provide a balanced approach to human performance management. Once the organisation has confidence that robust plans are in place to achieve Level B for all 10 elements, attention can then also be directed at achieving Level C for some.

If assessment shows that an organisation is already at Level C or above for some elements, maintenance of these levels should be achieved while the focus is on increasing the levels for the other elements.

The **Human Performance Management Assurance** element brings together the 10 elements and their inter-relationships to provide assurance of the human performance management programme as a whole.

In line with the recommended target for the *CANSO Standard of Excellence in Safety Management Systems*, it is suggested that an organisation should target achievement of at least Level C for each element in the *CANSO Standard of Excellence in Human Performance Management*. At Level C, it is considered that human performance is being actively managed in a consistent manner across the organisation.

A number of terms are used within the Standard. The list of key words at the end of this document provides definitions of generic terms which are used across multiple elements, and specific terms which are used within single or small numbers of elements. Based on feedback, these terms have been updated and reclarified as of 2024.

How to Assess Maturity in Human Performance Management

The format of each element within the *CANSO Standard of Excellence in Human Performance Management* is structured using the layout shown in the example below. The question set for all 12 HP SoE elements are available via the HPM Workgroup.

1. Policy, Strategy, Resources		
Objective	**To establish a Human Performance Management system which supports the achievement of the organisation's goals**	
Level	**Capability Statement**	**Assessment Question**
A **Informal Arrangements**	There is no recognition of the importance of human performance management in achieving the organisation's goals.	
B **Defined**	There is recognition that human performance management will bring benefit	Is there recognition that human performance management will bring benefit?
	Plans are in place to set up a human performance management system	Are plans in place to set up a human performance management system?
	Plans are in place to set target levels of maturity for each of the elements within the human performance management system	Are plans in place to set target levels of maturity for each of the elements within the human performance management system?
C **Managed**	There is a human performance management policy	Is there a policy for human performance management?
	There is a human performance management strategy	Is there a strategy for human performance management?
	The target levels to be achieved for each element are agreed at the appropriate level	Are the target levels to be achieved for each element agreed at the appropriate level?
	There is a procedure in place that manages the interrelationships between different elements	Is there a procedure in place that manages the interrelationships between different elements?
	A person is identified with a clear responsibility for the human performance management system	Is a person identified with a clear responsibility for the human performance management system?
	The responsible person has a budget and programme for human performance management	Does the responsible person have a budget and programme for human performance management?
	Appropriate resources are provided to undertake the programme	Are appropriate resources provided to undertake the programme?
	A human performance management system is implemented according to the policy and strategy	Is a human performance management system implemented according to the policy and strategy?

How to Assess Maturity in Human Performance Management (continued)

1. Policy, Strategy, Resources		
Objective	**To establish a Human Performance Management system which supports the achievement of the organisation's goals**	
Level	**Capability Statement**	**Assessment Question**
D **Assured**	Performance indicators are used to assess the effectiveness of the human performance management system	Are performance indicators used to assess the effectiveness of the human performance management system?
	Based on performance indicators, priorities for improvements to the human performance management system are identified, documented and acted upon	Based on performance indicators, are priorities for improvements to the human performance management system identified, documented and acted upon?
	Appropriate expertise, including human factors capability, is deployed in a way that is tailored and proportionate to the size and complexity of the organisation	Is appropriate expertise, including human factors capability, deployed in a way that is tailored and proportionate to the size and complexity of the organisation?
	Resources are continually available to fulfil the goals of the human performance management strategy	Are resources continually available to fulfil the goals of the human performance management strategy?
	The availability of a human performance management system supports the achievement of the organisation's business goals	Does the availability of a human performance management system support the achievement of the organisation's goals?
E **Optimised**	The human performance management system supports the organisation's long term strategy	Does the human performance management system support the organisation's long term strategy?
	The effectiveness of actions implemented for improving the human performance management system is measured and evaluated	Is the effectiveness of actions implemented for improving the human performance management system measured and evaluated?
	The knowledge gained for each element is incorporated into the other human performance management elements	Is the knowledge gained for each element incorporated into the other human performance management elements?
	The organisation learns about human performance management from external stakeholders and other industries	Does the organisation learn about human performance management from external stakeholders and other industries?
	The organisation actively participates in developing industry best practices in human performance management	Does the organisation actively participate in developing industry best practice in human performance management?

How to Assess Maturity in Human Performance Management (continued)

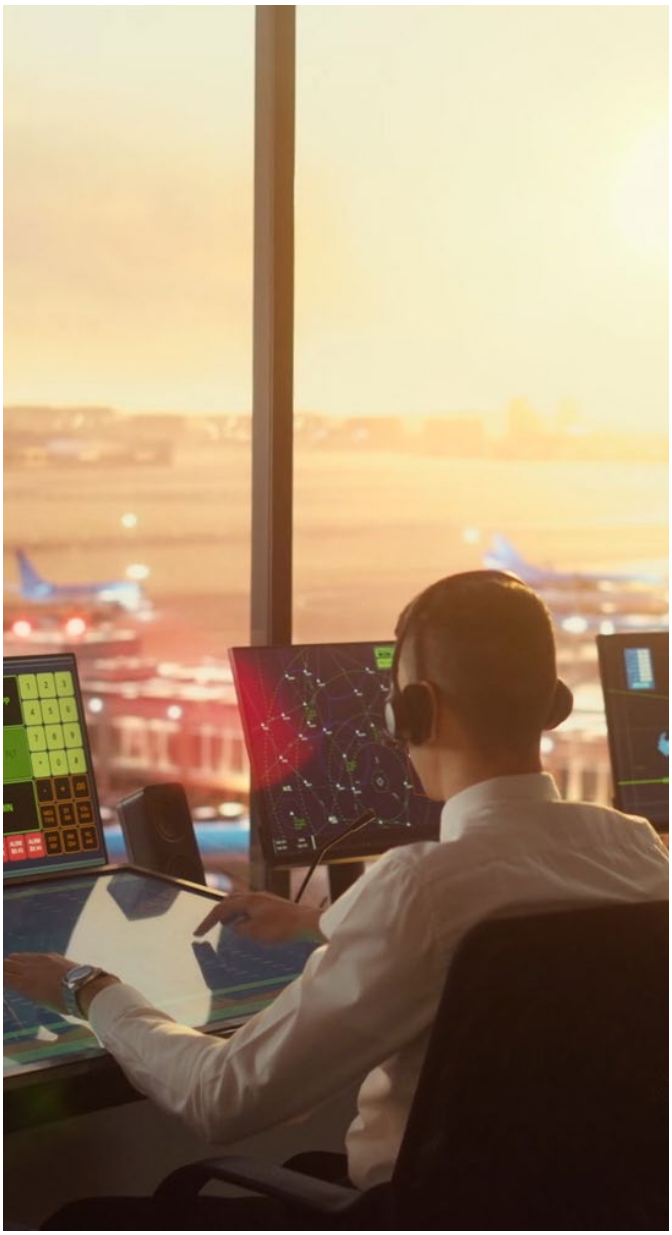
Each element starts with an objective which describes what the element is in support of. The five levels of maturity are then shown down the left hand side from *A: Informal Arrangements* through to *E: Optimised*. Against each level of maturity there are a series of capability statements which describe what will be in place once an organisation reaches a particular level of maturity.

All organisations start at *Level A: Informal Arrangements* and, as they become more mature, progress to *Level B: Defined* and then on to higher levels of maturity as decided by the organisation. For each level of maturity, the capability statements are turned into assessment questions. There are no questions at *Level A: Informal Arrangements* because this is the base level from which all organisations start.

An organisation should consider the assessment questions in turn for *Level B: Defined* and determine whether they have evidence to be able to answer 'yes' to the questions. In the example above, there are three assessment questions. If an organisation has the evidence to be able to answer 'yes' to all three assessment questions, then the organisation has achieved *Level B: Defined*. If the organisation has the evidence to be able to answer 'yes' to only 0, 1 or 2 of the assessment questions, it remains at *Level A: Informal Arrangements*. Undertaking this assessment informs the organisation of which capability statements it needs to work on (as planned actions) in order to achieve *Level B: Defined*.

The above procedure is then repeated for *Level C: Managed* and in the example above there are eight capability statements to be assessed. Again, if the organisation has the evidence to be able to answer 'yes' to all eight assessment questions, then the organisation had achieved *Level C: Managed*. If the organisation answers 'yes' to less than all eight questions, it remains at *Level B: Defined* but can use the assessment to identify which capability statements it needs to work on in order to achieve *Level C: Managed*.

It is recommended that an organisation goes through all the assessment questions up to *Level E: Optimised*. Experience has shown that it is possible to meet some higher maturity requirements while other lower maturity requirements are not met. This helps in getting a complete map of which requirements are met for any given element which, in turn, can help in determining which element should be prioritised and any associated actions.



How to get started right away

The Human Performance Management Workgroup is often asked how an organisation can utilise the SoE and deploy it. The SoE should be thought of as both a tool for assessing the current maturity state and as a set of guidelines about what could be included in a strategy or to implement future developments in human performance management. Based on several rounds of feedback and consolidation, the following 7-step procedure can be utilised for organisations to begin right away. Feel free to use these 7-steps as a checklist to make a start. As mentioned earlier, the HPM Workgroup is available to assist in making a start.

1. **Identify the lead assessor**
   Normally a manager or employee responsible for Human Factors, Human Performance or Safety Elements. It does not have to be a human factors specialist and may be anyone assigned to conduct auditing or reviews, but they should have some idea or basic understanding of the concepts involved.

   Note: We highly recommend engaging senior management and leadership at the earliest opportunity to explain the Human Performance approach.

2. It is recommended that the lead assessor is supported by a deputy who represents another element of the organisation. For example, some organisations use someone from an operational department to support the experts.

3. The assessing team then identifies the relevant managers, leaders or responsible people for each of the 12 SoE and arranges to conduct a 1-hour initial interviews with them. During this phase, it might be useful to map the different people, departments and units that are affected by the element. See the Annex for an example of this kind of mapping.

4. The SoE assessment does not need to be conducted in one go. You may choose to focus only on a few elements at a time. Traditionally, ANSPs do all 12 at once in a kind of audit approach, but this might be quite resource dependent. We recommend doing elements 1 and 12 either first or last, since they sandwich the other 10 to provide the overall management concept.

5. Sit down and conduct a (work) session using the Maturity questions as guidance (available by contacting the HPM WG). With expertise, feel free to Deep dive into different topics. The responsible manager for the area will be able to guide the assessment team as to the maturity of their area.

6. Sometimes, the responsible person for an area might be biased or missing some key information. We recommend holding additional data gathering or interviews with other people to create a well-rounded perspective of the actual maturity of an area. This can also be used as justification to reach higher maturity levels in element 1 and 12.

7. Results can be as simple as presenting the letter-grade of each element through to fully written reports with recommendations. The Annex shows some of the examples of how the SoE may be presented. Additionally, CANSO is working on solutions to provide benchmarking against other organisations (which will help you reach the higher maturity levels). Please contact the HPM Workgroup for the latest information.

Managing a Human Performance Management Programme

Human performance management is often undertaken across a number of different departments within an organisation. It is recommended that one individual is given responsibility for the Human Performance Management programme as a whole, or a joint steering committee is setup to oversee the implementation. If a single individual is identified then some of the elements in the programme may be under their direct control but some may not be. The lead, or steering committee, is, however, responsible for the quality of the human performance outcomes provided by each of the elements and reporting progress against the achievement of the human performance management goals agreed by the organisation. The lead, or steering committee, is also responsible for determining how the different elements of the human performance management programme feed into one another and for providing a co-ordinated overview of human performance management across the organisation.

To achieve human performance benefits, there is a requirement to commit resources, both personal and financial, to the implementation of the human performance management system. While the number of personal required will differ depending on the size and complexity of the organisation, organisations benefit from having dedicated human performance professionals who can focus on developing processes and systems appropriate to the organisation, its culture and operation. Resources will also be required to develop awareness in the wider workforce about the impact of the human performance management programme on their work (e.g. wellness, team working, training).

Conclusion

Good human performance is required to deliver good air traffic management. At a time when new technology and procedures are being introduced with a greater reliance on automation, a high level of performance from the humans in the system has never been so important. To keep the system safe, efficient and effective, adaptation and flexibility is necessary. It is the people in the system that provide this resiliency.

The *CANSO Standard of Excellence in Human Performance Management* provides ANSPs with a means for assessing their current level of maturity with respect to human performance management. It can also be used to identify an organisation's priorities for improvement and the actions that should be undertaken.

Support

The *CANSO Standard of Excellence in Human Performance Management* is managed by the CANSO Human Performance Management Workgroup.

If you would like further guidance on implementing the Standard, get in touch: **safety@canso.org**.

Key Words and Definitions

The following definitions of generic terms are used within the Standard of Excellence:

> **Human Performance Management Programme**
A set of related activities associated with human performance management which support the achievement of a long term aim.

> **Human Performance Management System**
An organised approach to managing human performance including the necessary organisational structures, accountabilities, policies and procedures. This is equivalent to the safety management system.

> **Systematic**
An organised approach to undertaking an activity which is documented and follows a set plan. Wherever and whenever the activity is undertaken within the organisation, it is undertaken in the same way.

> **Human Performance Aspects**
A consideration of how people do their job, their strengths, capabilities and limitations.

> **Process**
A written description of what wants to be achieved i.e. the end goal. For example, if a loss of separation occurs, the process could be to report it, assess it, investigate it, and produce a report with recommendations.

> **Procedure**
A written description of a series of steps taken in order to achieve an end goal. For example, when investigating a loss of separation, the procedure would set out the steps to be undertaken.

> **Plan**
A detailed proposal for doing or achieving a specific goal. It contains a written description of activities, actions, timescales and the resources needed.

> **Continually**
The activity is carried out on an on-going basis but with intervals of interruption. For example, someone checks their e-mails on a continual basis. This does not mean that they check at a prescribed time each day, or after a prescribed interval. Monitoring of e-mails takes place on an on-going basis but with intervals of interruption.

> **Regularly**
The activity is carried out at a prescribed time, or at a set interval. For example, aviation occurrence reports might be checked every morning at 07:00.

> **Timely**
Happening at the best possible moment, happening with enough time to allow for action to be taken before the change takes effect (Impact of Change)

The following definitions of specific terms are used within the Standard of Excellence:

> **Strategy**
A high level plan of action designed to achieve the major aim of managing human performance. (Policy, Strategy, Resources)

> **Policy**
A set of principles by which the organisation will manage human performance. It normally includes an objective, scope, and clear roles and responsibilities to meet the objective. (Policy, Strategy, Resources)

> **End Users**
The people who actually use, for example, the equipment, tools, procedures and training. (ATM Equipment and Support Tools, Impact of Change)

> **Operational Personnel**
The people who work in the operational environment e.g. controllers, supervisors, watch managers, technicians etc. (Teamwork and Communication)

> **Multi-disciplinary teams**
A team that includes people with different skills and backgrounds. This could be within an organisation or could also include people from outside the organisation. A multi-disciplinary team might include, for example, controllers, engineers, pilots, ground handlers, etc. (Teamwork and Communication)

> **Leaders**
People with defined roles and responsibilities within the organisation to lead. (Leadership)

Key Words and Definitions (continued)

> **Informal Leaders**
People within the organisation with influence, trust and respect from their colleagues but without a defined role or responsibility to lead. (Leadership)

> **Human Performance**
The ICAO Manual on Human Performance (Doc 10151) defines Human Performance (HP) as the capabilities and limitations of human beings that impact the safety and efficiency of aeronautical activities. This definition emphasises the role of humans in contributing to overall system performance within the aviation industry. It integrates various aspects of human factors to ensure safe and effective operation by considering human abilities, characteristics, and limitations in the design of equipment, environments, and jobs within the aviation system. See our page above for clearer outline.

> **Human Factors**
Human Factors refer to any factor that affects and contributes to human performance. It is a multi-disciplinary field encompassing psychology, engineering, industrial design and operational research. Human Factors also focuses on understanding the interactions among humans and other elements of a socio-technical system, applying principles, data and methods to design and evaluate systems. See the human performance pyramid above for clearer distinction.

> **Human Performance requirements**
A necessary condition regarding the consideration of how people do their job, their capabilities and limitations (environment), e.g. reliability; meantime between failure; workability and usability; frustration factor; work culture; ergonomic factors)

> **Human Performance System Factors**
These refer to the overarching components and structures within the socio-technical system that influence human performance. In the HP pyramid these are shown as cultural, infrastructure and talent management. These factors are often fixed elements of the air traffic management or aviation ecosystem and are designed to support human performance by reducing errors and enhancing efficiency, such as enforced by regulation, procedures or even fixed geographical boundaries.

> **Human Performance Systematic Factors**
These are the organisational and procedural practices that ensure continuous, proactive management of human performance. They include processes such as rostering, fatigue risk management, competency-based training, human error reporting, and performance monitoring systems. Systematic factors are dynamic, involving regular evaluation, adaptation, and improvement to maintain and enhance human performance within the system. In aviation, systematic factors are managed to optimise the integration of humans into the operational environment, ensuring safe and efficient outcomes.

> **Safety Management System (SMS)**
A SMS is a systematic, explicit, and comprehensive process for managing safety risks in aviation. It includes four key components: safety policy and objectives, safety risk management, safety assurance, and safety promotion. SMS ensures that hazards are identified, risks are mitigated, and safety is continually monitored and improved within the organisation. It integrates human performance into safety processes, ensuring that both system and systematic factors are aligned to enhance safety outcomes across aviation operations. For more information see the CANSO SMS SoE.

> **Human Performance Data**
Encompasses both individual and organisational-level metrics that contribute to the effectiveness of human operators within the system. This data includes not only individual cognitive, physical, and psychological measures such as workload, stress, fatigue, and situational awareness but also operational and systematic factors like rostering, shift patterns, traffic complexity, fatigue risk management, and system errors or occurrences. Human performance data integrates these multiple layers to provide a holistic view of how human factors, both at the individual and organisational levels, impact overall system safety, efficiency, and resilience.

Annex

1. Document Objective

The objective of the CANSO Annex A is to provide Air Navigation Services (ANSPs) with a guide to identify the best human profiles or role descriptions that contribute to implementing a higher maturity level in the 12 elements of human performance management in the CANSO SoE and allow ANSPs to conduct their own SoE reporting no matter where they are beginning from. Human Performance (HP) can be most successfully managed when we bring together a lot of people and roles with the conscious strategy of achieving higher performance across an organisation.

Finding the right people to fill the right positions is essential in any institution, even more in organisations where safety is one of the main elements of the daily activity. As shown in the HP Pyramid in the main SoE, achieving higher performance requires the engineering and investment in a lot of different human factors. Bringing these together requires a plan, a strategy and a set of people and roles that make it all happen.

This document establishes a crucial connection between the requisite hard skills and essential soft skills necessary for fulfilling the requirements of the person responsible for Human Performance Management or the joint steering committee responsible for overseeing the implementation of Human Performance Management. It then outlines the 12 HPM SoE elements in more detail before providing some suggestions on how to report SoE findings and finally covers some of the competency backgrounds that ANSPs have for Human Factors specialists.

2. Definition of Technical and Non-Technical Skills

One of the biggest challenges with human performance management is the continuous development and maintenance not just of technical skills, but also of non-technical skills to achieve high performance. As shown in the Human Performance Pyramid in the main SoE document, in order to achieve higher levels of overall performance, whether that be in a team context or individual basis, requires investment in both sets of these skills.

Technical Skills

They are associated commonly with education knowledge that comes down to specific job-related expertise, and the ability to put theory into practice in a workplace environment. For operational roles, they are usually regulated by a set of requirements that must be certified by the State or organisation responsible for licensing.

As required technical skill sets may vary depending on the organisation and state requirements, only a generic list of technical skills have been added, this allows ANSP's the ability to tailor their matrix to suit specific technical competencies.

The technical skills associated to the HPM SoE are:

> Policy, Strategy and Resources
> Health and Wellbeing
> Air Traffic Management (ATM)
> Operational Procedures
> Operational Training
> Selection
> Impact of Change
> Leadership
> Roles and Responsibilities

Non-Technical Skills

They are the softer human-related skills that have a more constructive benefit than hard skills in addressing quality management, continuous improvement, teamwork, and the consolidation of the market position of an organisation. They are usually not regulated, nor often remembered but they can make all of the difference in achieving the highest levels of sustained human performance. We sometimes think about these as the 'confidence and resilience' aspects of our people.

Typically, we talk about the assessment of 3 soft skill sets that fall into 5 essential categories of Self-Awareness, Self-Regulation, Self-Motivation, Social Skills, and Social Awareness. These categories of soft skills are based upon research that has identified the positive relation and correlation between the constructs of building employability capital and soft skill competencies (Bisschoff, 2019).

Annex (continued)

The non-technical skills associated to the HPM SoE are:

> **Teamwork and Communication**

> **Human Performance Investigation and Learning**

> **Human Performance Assurance**

However, in all the competences detailed in the SoE, a mixture of technical and non-technical skills is required to make the job.

The different layers of the competency scale from 1 to 5 are detailed below:

Scale	Rating	Hard and Soft Skills Matrix Definitions
5	Excellent	Individuals' hard and soft skills are significantly above criteria for successful job performance. The experience and the educations are in accordance with job performance expected.
4	Very Good	Individuals' hard and soft skills exceeds criteria relative for successful job performance. The experience or education are in accordance with the performance expected.
3	Good	Individuals' hard and soft skills meet criteria relative to quality and quantity of behaviour required for successful job performance.
2	Weak	Individuals' hard and soft skills generally do not meet criteria relative to quality and quantity of behaviour required for successful job performance.
1	Poor	Individuals' hard and soft skills are significantly below criteria required for successful job performance.

We recommended that when looking at the profiles required to conduct human performance management elements, that assessment not just of technical skills, but also of non-technical skills is required in an organisation. As the SoE is conducted, and the dimensions and understanding of human performance management functions or roles is developed, the identification and enhancement of these skill can also be reported on.

Implementing a clear set of recommendations to highlight and invest in development of human performance technical and non-technical skills is vital across an organisation to developing the highest levels of performance maturity.

Annex (continued)

3. HPM SoE 12 Elements

There are 12 HPM SoE Elements. Human Performance Policy, Strategy and Resources and the last, being Assurance of the HP Management, are designed to sandwich the main 10 elements. In this way, the 12 can be thought of as a complete management system.

A review of the 12 elements and feedback from CANSO member states is that interpretation of the definitions of the elements is not clear. The 12 are outlined here in more detail:

Policy, strategy and resources

Policy: Establishing clear and robust policies is crucial for guiding the implementation of the human performance management system within an ANSP. These policies should meticulously outline the expectations, standards, and procedures governing how the navigation provider's performance is measured, evaluated, and enhanced within the organisation. A well-defined policy framework forms the bedrock for consistent and equitable management practices.

Strategy: Developing a strategic approach is paramount for optimizing operations within an ANSP. This involves aligning the ANSP management system with broader organisational goals. The strategy should encompass methods for identifying and addressing performance gaps, fostering a culture of continuous improvement, and promoting employee engagement. A well-crafted strategy ensures that human performance efforts align with the overall strategic direction of the organisation.

Resources: Allocating adequate resources is indispensable for the successful implementation of the human performance management system. This includes financial resources for training programmes, technology for performance monitoring and analysis, and personnel dedicated to overseeing the system. Human performance management thrives when supported by the necessary tools and personnel, enabling the organisation to proactively address performance issues and capitalise on opportunities for improvement.

The professional profile for the role of Policy, Strategy, and Resources should ideally include individuals with a background as an Air Traffic Controller or possess a degree in Aviation with demonstrated experience in management and strategy. Candidates should have a proven track record of managing personnel and a minimum of five years of hands-on experience within the aviation industry. This ensures that candidates not only bring essential operational insights from their air traffic control background but also possess the necessary managerial and strategic skills to effectively contribute to the development and implementation of policies, strategies, and resource management within the aviation sector.

Health and well-being

Facilitate good physical and mental health as well as the well-being of staff throughout the organisation.

Organisations are run by people who need to have a balance between professional and personal life. Health and well-being in private life is primarily the responsibility of individuals, but professional well-being and health are also the responsibility of the organisation. Human Resource Managers, on behalf of the responsible manager, must implement all necessary measures to keep employees, and therefore the company, in good condition.

A Bachelor's or Master's Degree in Human Resources Management or a related field, applied to psychology, is preferred. Alternatively, a certification or additional coursework in Workplace Health and Well-being is acceptable, focusing specifically on strategies for promoting physical and mental health in the workplace.

A minimum of 5 years of experience in Human Resources Management within the aviation industry is required. Demonstrated experience in managerial roles, particularly those emphasizing employee well-being and fostering teamwork, is essential.

Annex (continued)

Air Traffic Management (ATM) Equipment and Support Tools

Effectively addressing human performance requisites is essential throughout the entire life cycle of Air Traffic Management (ATM) equipment and support tools, spanning design, implementation, and operation phases. Ensuring seamless human interaction during the design stage involves meticulous attention to ergonomic factors and user interface design. The implementation phase emphasises the integration of real-time monitoring features and adaptive interfaces to optimise cognitive load. In the operational phase, continuous support is crucial, involving performance monitoring, data analytics, and predictive maintenance. Comprehensive training programmes, proficiency assessments, and user feedback mechanisms further contribute to sustained competence, fostering the efficient and safe functioning of ATM systems.

Applicants for this position should possess either a Bachelor's or Master's Degree in Human Factors Engineering, Human-Computer Interaction, Ergonomics, or a related field. Alternatively, candidates with an Air Traffic Control license and knowledge in operational and simulator contexts will also be considered.

In terms of professional background, individuals with extensive experience in roles related to Human Factors or Human-Computer Interaction are required, particularly within the aviation or Air Traffic Management (ATM) industry. The candidate should have had a proven track record in developing and delivering comprehensive training programmes for ATM professionals and conducting proficiency assessments. Additionally, experience in establishing mechanisms for continuous improvement through user feedback is highly valued.

Regardless of what type of equipment is being evaluated or approved, there are many considerations relevant to human performance. When evaluating the HPM SoE for this element, the analysis should be making sure that these systems have safety and performance assurance in: a) error management (including prevention, detection, and recovery) - such as human data entry errors and how the system or equipment is designed to catch or 'trap' the errors; b) task performance - such as time to complete task(s), procedures needed to perform the task; c) workload - such as the amount or intensity of effort involved in a task, and the task's sequencing, or overlap with other tasks; d) learnability and usability - such as the degree to which learning to use and operating the equipment can be done effectively and efficiently; e) complexity - such as the number and/or nature of interconnected/ interactive components; f) context – such as the particular operational context and conditions of use; g) situation awareness - such as the operator's awareness of the current and future state of the system and of the task expected of the equipment and the operator under different conditions of use; h) maintainability - such as the degree to which the design allows for ease of maintenance and servicing; and i) crashworthiness, survivability and resilience aspects of aircraft, vehicles and associated system.

Operational Procedures

To oversee the needs of human performance throughout the development, execution, and utilisation of operational procedures.

Acquiring knowledge and understanding of operational procedures is a process that evolves over time, drawing from years of experience, learning opportunities, and the lessons learned from mistakes. Theoretical knowledge of air traffic management (ATM) situations, such as runway change procedures or speed control, is truly comprehended when put into practice. Operational procedures extend beyond mere theoretical understanding to encompass a thorough grasp of how various stakeholders in the ATM environment collaborate. This involves adhering to agreements between different entities, coordinating with airports, firefighting services, and other Approach or Area control centres. Ultimately, a combination of theoretical learning and practical experience forms the foundation for a comprehensive understanding of operational procedures.

The professional profile for operational procedures should be an operator with at least 10 years of operational experience. Alternatively, an expert with experience in human-centered design and minimal 5 years of experience in developing procedures for operational practice will also be considered.

Annex (continued)

Teamwork and communication

To have an effective exchange of information and security awareness through teamwork and communication.

Teamwork is an essential aspect of any organisation. The way people collaborate defines the success or failure of a project or organisation. The difference between good and bad teamwork is related to how we interact with other members of the group, empathy, shared vision, and goals. Furthermore, our communication within the group contributes to achieving its objectives. The three main methods of communicating our intentions (verbal, non-verbal, and paralinguistic) can either enhance or negatively impact the quality of communication within our team, thus affecting the achievement of group objectives.

The individuals chosen to manage teamwork and communication must be capable of leading the team and articulating the direction they wish to take ('If one does not know to which port one is sailing, no wind is favourable' - Seneca).

The ideal professional profile for Teamwork and Communications should include expertise with a minimum of 10 years of experience in team and project management. A qualified project manager with experience in aviation projects would also be suitable. Alternatively, an operational manager or supervisor with minimal 5 years of experience in Team Resource management will be considered.

Operational Training

Guarantee that elements of human performance are incorporated into the planning, substance, and implementation of operational training.

Operational experience is gained through performing work in real situations and acquiring hands-on experience. The knowledge, skills, and attitudes learned in initial training are applied in the unit. The experience accumulated over the years is eventually incorporated into the operational training provided to operational staff (ATCOs, ATSEPS, AIS experts, etc.).

The professional profile for operational training should be primarily an operator with at least 10 years of experience. An alternative is also a bachelor's or master's Degree in educational science and training design with minimal 5 years of experience in operational training and understanding of the knowledge, skills and attitudes required in the operational work.

Selection

Selection is a crucial component of any organisation. Choosing the right individuals for the appropriate roles often determines the success or failure of a project. However, the selection process is not infallible; while initial assessments, typically based on one or two interviews, provide an overview of candidates' profiles, they offer only a glimpse of their knowledge, skills, and attitudes. The true measure of a candidate's performance emerges through their day-to-day work over months and years.

Traditionally, the responsibility for selection has rested with HR departments, in collaboration with the departments seeking candidates. Consequently, expertise in both general selection practices and technical knowledge relevant to the specific job is essential in this field.

The ideal candidate for a selection role should be an expert in recruiting aviation professionals such as Air Traffic Controllers, Instructors, ATSEPs, or Administrative Staff, with a minimum of five years of experience.

Impact of Change

Changes in air traffic management operations can significantly impact human performance. Factors such as increased cognitive load due to procedural changes, additional training requirements, altered workload distribution, and communication protocols can lead to mental fatigue, decreased attention, and errors. Decision-making processes may also be influenced, requiring adaptation to new procedures or technologies. Changes can introduce stress and fatigue, emphasizing the need for effective strategies to mitigate these effects. Managing such changes necessitates careful planning, communication, training, and support to ensure the safety and efficiency of air traffic management operations.

Annex (continued)

Impact of Change (continued)

Change management in organisations can take many different forms. Often there is no one person responsible for change, but a set of programme and project managements often linked by change gates and a requirements management system.

We recommend that someone is identified who can ensure that Human Factors and Human Performance requirements and elements are successful implemented and monitored through the life cycle. This may not necessarily be an ATCO of Safety Specialist, but it is important to remember that our network and systems are often focused – through regulations on reporting occurrences and assurance – on the 'end user' which is normally an ATCO or Unit Manager. Therefore, overseeing the 'impact of change' from a 'user' perspective is often someone with an operational or safety background.

Leadership

This element is often challenging to those in positions of management. However, we understand that achieving leadership across an organisation requires not just appointment management, but often unofficial leaders, union leaders, eager volunteers, passionate advocates and strong voices on the ops floor. It is important to manage all of these voices and utilise them in the best possible way. Often, someone with a human resources or human factors background is able to bring these voices together, and at least implement the vital training in non-technical skills to achieve better leadership.

Leaders themselves in an organisation do not necessarily need a human performance or human factors background, but should strive to understand the importance of investing in a HP programme. When assessing this element, the amount of HP/HF competence should be captured, as this is often a key part of improving this element. Having management and leaders who are engaged in the system and concepts of HP is fundamental to achieving higher maturity.

Leadership means leading others as well as leading themselves. Leaders teach by example, motivating and bringing out the best in each team member. The competencies of leaders are quite similar in different organisations.

Leaders have to aim high, encourage their teams, not be discouraged by setbacks, solve problems, improve activities, not create problems where there are none, enjoy their daily work, and all these competences have to be reflected in their team.

The professional profile therefore should ideally be someone with experience leading teams and who has had some training in leadership management techniques, preferably in the aviation industry for a minimum of 5 years. We have observed that many organisations place operators into management position without giving them the key training on management and leadership techniques, especially in soft-skill development. We highly recommend that this is considered when appointing people in leadership positions.

Roles and responsibilities

Ensure that roles and responsibilities with respect to human performance management are defined and fulfilled.

This element aims to trace the creation of roles within organisations back to their original task designs. Often, organisations have many historical roles that have deviated from the tasks that are supposed to be completed. Alternatively, roles might be prescribed by legislation (such as the ATCO or Service Engineer). Human Performance engineering of roles is vital to ensuring the maximum human performance can be achieved in these by the person within that role. As a result, the element exists to help organisations design and monitor the creation and development of roles and the associated responsibilities with those roles.

The element is usually maintained by elements of the Operational requirements, Human Resources departments and safety engineering, and human factors. Therefore, a mixture of expertise is required to understand how roles and responsibilities are created and maintained.

Annex (continued)

Human Performance Lesson Learning

Identify strengths and weaknesses related to human performance. Share and apply lessons learned across the organisation.

This element historically focuses on the investigation of safety occurrences and safety auditing to create a 'Safety 1' perspective. As a starting point, most organisations couple some kind of human factors analysis to their occurrence investigations procedures and/or auditing functions (both internal and external).

However, increasingly, organisations are turning to broader 'Safety 2' concepts including safety intelligence from data gathering, active monitoring of human performance through measurements and analysis and the understanding that human factors concepts can be engineering into change projects using standards and design practices.

We recommend that this element addresses as many areas of human factors lesson learning as possible including but not limited to investigations, auditing, change management, selection and recruitment measures, training outcomes and human resources data such as motivation, culture and occupational health data. By looking at as many signals as possible, the best overview of human performance understanding can be achieved.

Human Performance lesson learning should support both mandatory and voluntarily identified safety issues. While regulators need to check that mandatory safety reporting requirements are complied with, it is often voluntarily provided contextual information that can most help a service provider to understand why someone acted in the way they did. That understanding is necessary in order to find better ways to support HP. Such contextual information may include the reporting of specific operational or al factors, such as: a) interactions with other aviation professionals, issues with phraseology and communication and language; b) work conditions (e.g. level of automation, authority and responsibility, support staff); c) environmental information (e.g. weather, remoteness, topography); d) task specific workload (e.g. task intensity (under or over arousal), complexity of the task); e) experience level of the reporter or those who they were working with; f) staffing arrangements (e.g. provision of cover for sickness or other absences, authority status of staff, isolation of staff (lone workers)); g) commercial pressures (e.g. financial motivations of a particular company may result in the erosion of safety buffers); h) shift related factors that impact on fatigue (e.g. shift pattern and duration, stability of the working pattern, use of overtime); and i) impact of changes to working organisational structures or processes and procedures.

Human Performance Management Assurance

This element brings together all of the elements. A Human Performance system is managed when there is high assurance that the elements, procedures and mechanisms developed are effective and producing the best results. Therefore, this element is usually the prevue of the person responsible for human performance or human factors. They need to ensure that existing elements are working properly, have areas for improvement or need implementing from scratch. This element is usually also overseen by leadership commitment at a director level, and in most organisations is required by Operations and Safety leadership.

Annex (continued)

4. Suggested Methods of Reporting SoE Results and Analysis

The SoE results may be presented in any way relevant to your organisation. It may be that the simplest way is to illustrate the letter gradings and compare them year for year. The following example is from an ANSP who conducted the SoE assessments in three different years. They have then put them side by side to see progress. In this case, they have split some of the elements into 'Rest of Company'/'ATM department' because the ATM department received a lot more investment and higher maturity than the rest of the organisation:

Study Area	Level 2019	Level 2020	Level 2023
1. Policy, Strategy, Resources	B	B	C
2. Health and Wellbeing	C	C	D+/E-
3. ATM Equipment and Support Tools	C	C	C+
4. Operational Procedures	D	D	E
5. Teamwork and Communication	C	D	C
6. Operational Training	D	E	B+/C+
7. Selection	D	D	B+/C+
8. Impact of Change	B	C	C
9. Leadership	A	B	C
10. Roles and Responsibilities	B	B	B
11. Human Performance Investigation and Learning	C	E	E
12. Human Performance Management Assurance	A	C	C+

Following the results above, the same ANSP also set goals by highlighting the elements they want to focus on and also showing their goals next to the current results:

Study Area	Level 2023	Level 2025 Goal
1. Policy, Strategy, Resources	C	D
2. Health and Wellbeing	D+/E-	E
3. ATM Equipment and Support Tools	C+	D
4. Operational Procedures	E	E
5. Teamwork and Communication	C	C
6. Operational Training	B+/C+	D
7. Selection	B+/C+	C+
8. Impact of Change	C	C
9. Leadership	C	C
10. Roles and Responsibilities	B	C
11. Human Performance Investigation and Learning	E	E
12. Human Performance Management Assurance	C+	D

Annex (continued)

4. Suggested Methods of Reporting SoE Results and Analysis (continued)

Another ANSP has shared a sample of their reporting for 2023. In this report, the ANSP chose to map all of the relevant areas that applied to each element. This is a useful approach to understand all of the different parts that go into producing human performance. This ANSP has shared 3 different elements with different maturities. It can also be seen that the ANSP chose to report on 'strengths' and 'opportunities' rather than using works like 'weaknesses' or 'improvements' in an attempt to encourage active participation in developing improvement measures collectively.

4.1 Policy, Strategy and Resources (C)

The element covers the maturity of HP management through policy, strategy, and resources (see Appendix A in CANSO SoE). This year's results demonstrated that our organisation has a 'managed' set of processes for this. Our organisation has a valid Human Performance Strategy document that covers all of these elements. The following was found during the workshops:

Strengths:

> One of the only ANSPs in Europe to have a dedicated HP Strategy
> Strong competencies in Human Performance and Human Factors
> Well informed from outside Austria via international participation
> Strong set of management systems and recognition of HP as an enabler of system

Opportunities:

> Strategy not well understood outside of Safety and Quality/ATM Departments
> Implementing strategy requires updating and training non-ATM Ops personnel
> Lack of 'buy in' from other departments, Unions and Directors
> Human Performance team struggled to get going efficiently
> Opportunity for more HF Resources and Competencies in Engineering and ATM departments

Annex (continued)

4.2 Health and Well-Being (D+/E-)

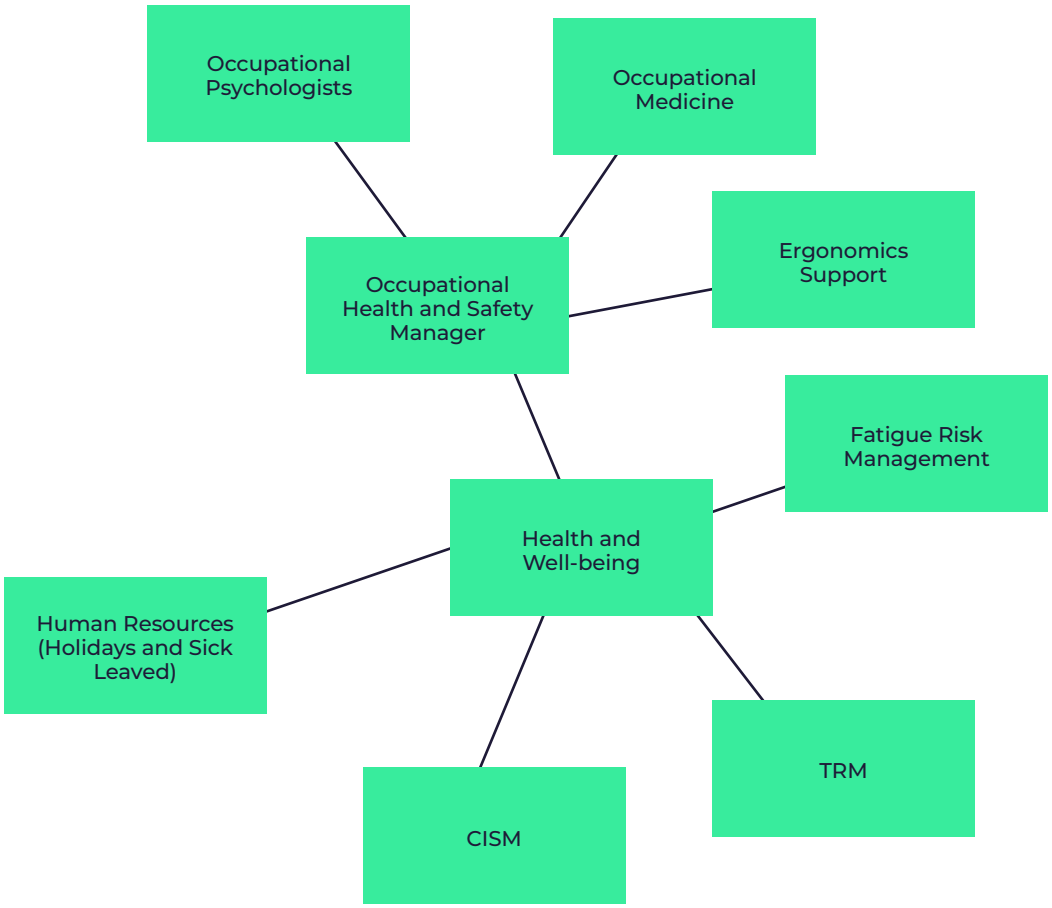
Occupational Health and Safety is one of our organisation's biggest strengths. However, this element also includes other operational support concepts such as Critical Incident Stress Management (CISM) and Team Resource Management (TRM). The SoE workshops found:

Strengths:

> Very established set of processes and procedures
> Strong team and recognition across company of the importance of OSH, Health and Well-being in achieving sustainable performance
> Large opportunity of offers/support/training
> Demonstrated value through COVID period
> Continuous communication is valued
> A diversity programme has been started

Opportunities:

> Although offers are regularly advertised, individual ownership of health is not as strong. Psychological safety is cited as a problem within the culture
> Diversity and organisational culture is possibly impacting health and well-being but not captured very well
> Bullying, harrassment, and discrimination is still present within the culture and stronger systematic barriers required



Annex (continued)

4.3 Roles and Responsibilities (B)

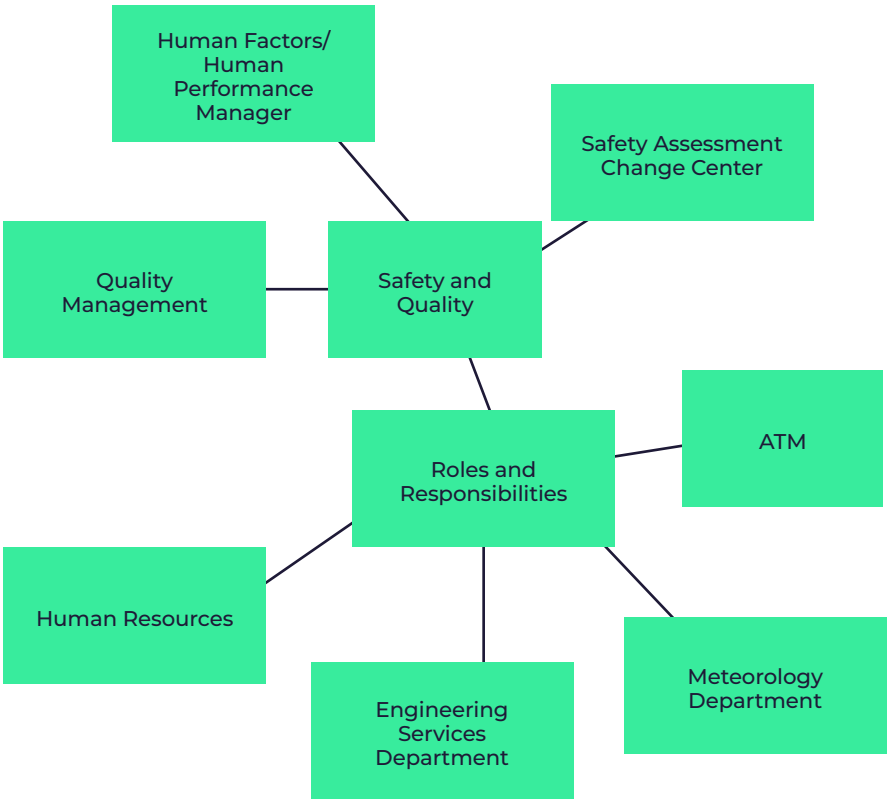
We are a mature organisation with many established roles. Often however, this means that the tasks that need to be achieved do not align with what certain personalities believe they should do in their roles (See Wickens, 2021). This can lead to divergence between established roles, how they are interpreted and responsibilities to be fulfilled. This is an area we could improve a lot on with more design and focus on tasks rather than roles. We have limited HP/HF expertise within the organisation and this needs to be improved as well.

Strengths:

- New policy concerning roles and establishing new roles
- Use of Organisational charts is understood organisationally
- Some HP competence within the organisation
- HP/HF knowledge exists where it needs to be

Opportunities:

- The lines of command could be strengthened to ensure consistency
- Establishing of roles vs tasks being increased HP tools and methods (linked to HR selection and design of jobs)
- Development of HP/HF competency framework and include in HP Strategy
- Increase knowledge of this element across organisation



Annex (continued)

5. Guidance on the qualifications and Accreditation of Human Factors Specialists and Aviation Psychologists

Since 2010, there has been a marked rise in the amount of legislation and regulation pertaining to the need for Human Factors and Human Performance assurance across aviation. This has also seen a surge in the training, qualification and accreditation of specialists in human factors and aviation psychology. Although there is no one global standard, there are several sources of competency frameworks and certification standards in existence for these types of specialists.

An organisation *does not need* a Human Factors specialist in order to conduct the Standard of Excellence assessment, but generally, organisations are encouraged to have some competence in human factors, human performance and/or aviation psychology in order to develop and implement human performance plans.

These types of specialists generally have a background in organisational/industrial or clinical psychology or engineering with additional training in ergonomics or human factors. Most specialists will have a university Masters level qualification plus additional experience and/or accreditation. There is normally a difference between a qualified and registered psychologist, generally required for selection or mental health screening and a human factors specialist in terms of licensing, but they are not necessarily always different people.

For examples of detailed requirements of these specialists, please refer to one of the major accreditation organisations such as:

1. The European Association for Aviation Psychology (EAAP) – E.U.
2. The Chartered Institute of Ergonomics and Human Factors (CIEHF) – U.K.
3. Human Factors and Ergonomics Society (HFES) – U.S.A
4. Human Factors and Ergonomics Society of Australia (HFESA)

A comprehensive proposal for a framework of competencies for all types of personnel involved in the spectrum of human performance, human factors and aviation psychology is available by referring to the paper written by:

Biede., et al. (2023). A Competency Framework for Aviation Psychologists and Human Factors Specialists in Aviation. *Aviation Psychology and Applied Human Factors*.

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