White Paper on Safety Culture for Air Operators

AESA AGENCIA ESTATAL DE SEGURIDAD AÉREA

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Aviation safety management systems have been part of our reality for years now, and their development has been a challenge both for the industry and for the State, but they will not be effective if they do not include a positive safety culture. Therefore, it is crucial that all the people forming part of any kind of aeronautical company or agency perceive, appreciate, and prioritize safety, because this will define the organization's safety culture, and, consequently, the organization will be able to implement and maintain its safety management system.

It is important to remember that safety management is not limited to putting down procedures on paper, it is necessary for each and every person forming part of the process to become involved, and for organizations to take a step forward to face unsafe activities and be capable of identifying risks correctly.

But it is also true that this safety management process must adopt a common language, so that all the actors involved know how to anticipate, detect, and prevent possible problems. Thus, the aim of this White Paper is to describe AESA's vision of safety culture, and to provide parameters to create a common framework for air operators, to create an environment fostering a safety culture throughout the sector.

It is essential that air operators understand that safety culture is key for carrying out their operations, and that safety management systems are based on that principle.

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INTRODUCTION

Area of interest

Safety culture is essential for safety, but since it is an intangible concept, determining its impact on safety and associated risks is complex. This makes it difficult even for those who are convinced of its importance to fully convey how crucial it is, while also making it easier for those who are less convinced of its importance to relegate it to the background.

Therefore, it is essential to prove the connection between the safety culture and its impact on safety, using a more practical approach, to prove its importance and how it can make a real difference for all the actors involved, whether crews, continuing airworthiness staff, ground handling staff or senior management.

Goals of the White Paper

The Spanish State Safety Programme (PESO, *Programa Estatal de Seguridad Operacional*) established the implementation of an effective safety culture throughout the civil aviation sector as one of the State's safety objectives.

In this context, the aim of this White Paper is to promote the safety culture as one of the main contributing factors helping to improve safety in the framework of air operators.

To achieve this, three phases are proposed in the White Paper:

- A first phase, developing the safety culture concepts included in the ICAO (International Civil Aviation Organization) Safety Management Manual, describing AESA's vision, establishing a common framework for air operators, and proposing safety culture measurement tools. This first phase concludes with the publication of this first edition.
- A second phase, proposing the implementation of a pilot programme in one or more air operators, to adapt and optimize the proposed measurement tools, study the actions necessary to improve the safety culture within organizations, and draw lessons learned from the application of this model.
- A third phase, bringing together the lessons learned and the optimized measurement tools in a revised edition of this White Paper on safety culture for air operators.

Therefore, to achieve the main goal of promoting safety culture, the White Paper will define the basic concepts for understanding the safety culture and how it affects safety, provide measurement tools for assessing the level of safety culture within organizations, and offer lessons learned for improving the safety culture.

SAFETY CULTURE

What is safety culture?

Safety culture refers to the way, within an organization, safety is perceived, valued, and prioritized. It reflects the real commitment to safety at all levels of the organization. In short, it is the set of shared values, behaviours and attitudes regarding safety involving all people belonging to the organization, beginning with the accountable manager.

Safety culture is not something that can be imposed, given that it also includes the behaviours we adopt when no one is watching. It is essential to build a positive safety culture that reflects the commitment of the organization and of all its members to the safety principles that are integral to its corporate identity. It is important to keep in mind that safety culture can be destroyed much more easily and quickly than it can be built.

ICAO defines safety culture as the set of enduring values and. attitudes regarding safety, shared by every member of every level of an organization.

A positive safety culture is reflected specifically in the extent to which individuals are:

- aware of the risks and known hazards faced by the organization and its activities
- continuously behaving to preserve and enhance safety
- able to access the resources required for safe operations
- willing and able to adapt when facing safety issues
- willing to communicate safety issues
- consistently assessing the safety related behaviours throughout the organization

A key feature to building and maintaining a positive safety culture in any organization is trust between staff and management, which should be established and promoted by senior management.

Safety culture, like other cultures, is not rigid, but may evolve and must adapt to the specific environment.

Importance of the human factor

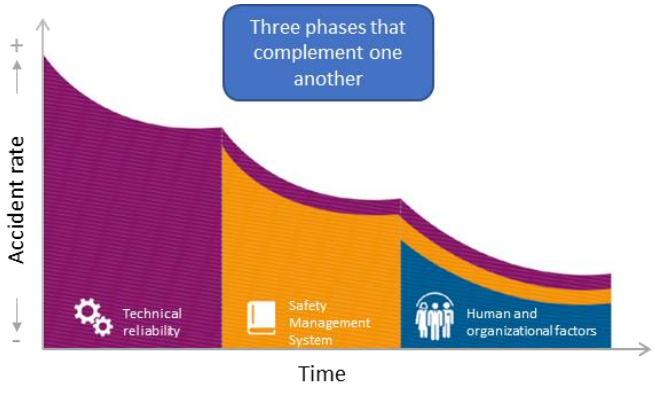
Safety performance is considerably affected by the way in which people assume their responsibilities in the sphere of safety and the way they interact while carrying out their tasks.

Although regulatory compliance is one of the main pillars of safety, it is essential to share several values to guide the conduct of the staff beyond mere compliance with regulations and procedures to improve safety.

The effectiveness of safety management largely depends on the degree of support and commitment of senior management as regards the creation of a work environment that optimizes human performance and encourages staff to participate actively, thereby contributing to the organization's safety management processes.

Regardless the improvements on regulation, technological aspects, or management systems, it should be considered that safety culture ultimately depends on the people concerned, as they are the decision-makers who must adapt to the specific circumstances of each situation.

Safety culture tells us how to act when nobody is supervising us and makes us feel responsible for unconsciously prioritizing safety in our actions.



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SAFETY CULTURE MODEL PROPOSED BY AESA

Spanish Aviation Safety and Security Agency (AESA) proposes a safety culture model based on the concepts and elements defined by ICAO, adapted to the European environment established by the European Union Aviation Safety Agency (EASA), as regards to both concepts of just culture and the relationship with organizational Safety Management Systems (SMS).

The model comprises three fundamental components:

- Establishment of a structured framework, defining elements that encompass all the spheres of action of the safety culture within an organization.
- Relationship between safety culture elements and SMS elements.
- Mindful leadership in safety, as an organizational nexus between the SMS and the safety culture.

Safety culture elements

The purpose of establishing a structured framework in safety culture elements is to represent, as comprehensively as possible, the complex operational reality of an organization. For each element, measurement systems will be established to determine the degree of maturity and implementation of the safety culture in each one, so as to facilitate identification of the strengths and weaknesses of each organization and thus be able to design a made-to-measure action plan.

The elements comprising the safety culture model proposed by AESA are as follows:

- Organizational commitment
- Resources
- Just culture
- Risk awareness and management
- Teamwork
- Safety communication and training
- Responsibility
- Participation

SAFETY CULTURE MODEL PROPOSED BY AESA

The following table describes the components of the model, its facilitators and its obstacles.

General description	Facilitators	Obstacles
Organizational commitment		
Safety commitment reflects the extent to which the different hierarchical levels of the organization have a positive attitude towards safety and recognize its importance. The safety culture model seeks to measure the coherence and credibility of communication by senior management, studying its commitment to safety and identifying when it is a genuine concern, a mere bureaucratic formality, or even a nuisance for management. In this regard, processes such as safety controls, safety assessments, safety investigations, audits or surveys, which are crucial for safety, could be perceived by management as an obstacle for the organization operation and, therefore, management might attempt to limit or eliminate them. Senior management must be sensitive to their employees' safety concerns. The level of support received by technical staff from their hierarchical superiors and the actions carried out will determine the extent to which the staff is willing to call attention to problems in the future.	✓Motivation and promotion of the safety culture by senior management ✓Provision of resources for safety-related tasks (for example, capacity-building) ✓Established processes for the ongoing supervision of safety management ✓Continuing search for a balance between the business model, effectiveness and safety ✓The consideration of safety improvements as offering advantages in terms of productiveness or efficiency	✗Not considering safety as a priority for the organization ✗Only investing in safety to comply with regulations ✗Not having formalized procedures with regard to safety management and oversight
Allocation of resources: human resources, equipment, training, and procedures		
This element values the appropriate allocation of resources and time, as well as their optimal integration into production. Equipment, in addition to staff and procedures, clearly plays a main role in safety. It is essential to be aware of safety when conceiving, designing, building, using, and maintaining them. Operational scenarios change over time; therefore, the organization's resources and procedures must be adapted to the way in which the work is done and to the level of risk of a given change or activity.	✓Assigning resources strategically and proportionately, in accordance with production ✓Taking into consideration working hours, shifts, schedules and limitations associated with the activity (fatigue, compatibility of work teams) ✓Employing a hiring model aimed at the appropriate professional profiles ✓Ensuring skills-building, through high-quality ongoing training with the appropriate duration and relevance ✓Efficient change management system ✓Designing user-friendly working procedures ✓Availability of material resources and appropriate and sufficient equipment for production	✗Not considering safety among the organization's priorities (for example, reducing costs without considering the impact on safety: training, equipment and resources) ✗Cost associated with the implementation of the measures (resources, training, equipment, procedures) ✗Insufficient allocation of resources for the level of production ✗Shortcomings in the staff training and capacity-building plan

SAFETY CULTURE MODEL PROPOSED BY AESA

General description	Facilitators	Obstacles
Just culture: Protection of reporters and trust in the system		
Organizations with just culture are those in which safety reporters are protected, information is returned after its analysis, and staff are encouraged to report incidents, including staff involved in flight data monitoring (FDM) programmes. In a just culture environment, it is necessary to guarantee the staff's trust in the reporting system, appropriately protecting the information contained in the reports and the reporters themselves, as well as in the FDM programme, guaranteeing that such information will not be used for purposes other than improving safety. As a result, an appropriate just culture will guarantee the continuous provision of quality information to improve safety analyses. Personnel should not be exposed to any consequences with regard to the information they have provided in the safety reports, except in cases of wilful intent or gross negligence.	✓Establishing mechanisms, procedures and protocols which clearly guarantee the protection of reporters and ensure the disidentification of the information ✓Providing incentives for the participation and involvement of employees in safety-related matters ✓Promoting prevention and mitigation measures with regard to safety incidents investigated ✓Proactive approach to safety, acting accordingly	✗Low level of staff involvement in safety matters ✗Reactive response/approach to safety matters, adopted only to fulfil an obligation. Safety actions only as a response to a serious occurrence or because regulations so require. ✗Seeking to identify blame for safety incidents, instead of seeking solutions ✗A lack of communication about safety after incident analyses
Risk awareness and management		
An organization that is aware of and manages risk is one that values commitment to safety, reflecting the extent to which staff and senior management are aware of the risks associated with the organization's business activity. Said risks must be identified, assessed, and monitored. Risks may occasionally be assumed under pressure and must be assessed and mitigated to an acceptable level. Communication, training, and teamwork are tools that enable procedures to be properly adapted to actual conditions and circumstances and to changes in our environment. Safety must be the priority of air transport, and this must be reflected in decision-making.	✓Identifying hazards effectively ✓Undertaking in-depth investigations of occurrences, seeking to establish the root cause and contributing factors ✓Continuously and systematically reviewing safety improvements, as well as their implementation and functioning or effectiveness ✓Knowledge of the safety risks caused by personnel's individual actions and the operations/activities of the air operator	✗Failure to make any effort to identify hazards ✗Undertaking superficial investigations of occurrences, which do not go beyond identifying the immediate probable cause, thus failing to identify the root cause ✗Lack of knowledge or interest of the organization in advances regarding safety ✗Lack of assessment regarding the proper implementation of safety improvements ✗Lack of knowledge of the safety risks caused by individual actions or by the operations/activity of the air operator ✗Safety data are collected, but they are not analysed, and no measures are taken on the basis of such data

SAFETY CULTURE MODEL PROPOSED BY AESA

General description	Facilitators	Obstacles
Teamwork		
Knowing how to work in a team is an essential skill when it comes to efficiently implementing safety within an organization. It is vital that each member of staff understands the roles and objectives assigned to them within the organization and knows the roles and objectives of the rest of the staff too. In this way, the staff will agree on what must be done and who must do it, achieving a well-integrated and well-organized team. Work teams include a mixture of different personalities, which may also be an origin of risks, and which must be properly identified and mitigated through good human resources management (for example, through Crew Resource Management [CRM] programmes). The organization will promote the creation of an atmosphere of open and participative communication, fostering collaboration between people with different and appropriate professional profiles in developing and implementing procedures and changes in the organization.	✓Providing staff with the knowledge, skills, and attitudes necessary to undertake their activities safely, through the study of concepts such as error, stress, situational awareness, communication and teamwork ✓Carrying out consultations and promoting staff participation in the design of processes in which they are involved ✓Fostering trust between workmates, promoting the participation and collaboration of people with different professional profiles in training activities (for example, cabin crew members with flight crews, flight crews with air traffic controllers, etc.) ✓Promoting the participation in safety studies of staff members with different professional profiles	✗Lack of direct channels of communication between staff members ✗Failure to take note of constructive comments aimed at improving safety ✗Promoting an atomistic view of the activity, limiting analysis teams and staff participation in these teams ✗Seeking to identify blame for safety incidents, instead of seeking solutions ✗Lack of knowledge of the roles and objectives of other staff within the organization
Safety communication and training		
Safety communication guarantees the flow of vital information on safety, ensuring that it reaches all the people within the organization who need to receive it. Safety information must be communicated along three main lines: firstly, it is essential that senior management receive the information they need to be able to make decisions concerning safety; secondly, it is crucial that staff receive feedback on the notifications they make regarding safety; and, thirdly, it is vital that staff receive training on the main safety aspects pertinent to the organization. The organization must establish appropriate channels of information that guarantee that safety communication is clear and that it reaches the right people, to prevent new risks stemming from disinformation.	✓Maintaining continuous and active communication between senior management and the safety department ✓Establishing pertinent information channels on safety for staff that ensure such information is received in a timely manner ✓Providing staff with feedback on safety reports, involving them in the actions carried out and the results of analyses ✓Regularly verifying the flow of relevant information on safety matters, ensuring that staff understand and act upon it ✓Promoting active knowledge transfer and training on safety (lessons learned) ✓Undertaking campaigns to disseminate good practices and share experiences regarding safety	✗Failure to consider safety one of the organization's priorities (for example, failure by senior management to participate regularly in safety meetings) ✗Lack of staff involvement in safety matters ✗Seeking to identify blame for safety incidents, instead of seeking solutions ✗Lack of monitoring of the flow and effectiveness of communication on safety issues ✗Absence of channels facilitating knowledge transfer or training ✗Shortcomings in training and in dissemination of information on safety

SAFETY CULTURE MODEL PROPOSED BY AESA

General description	Facilitators	Obstacles
Responsibility		
Personnel responsibility on safety implies the recognition of the importance of each activity and its direct or indirect contribution to safety. In this regard, it is essential to know to what extent the staff and management of an organization are committed to safety. Personnel responsibility on safety implies to understand that their own actions and individual attitudes have an impact on safety. This will favour a comprehensive perspective of individual contributions, especially in the case of staff members who are far from the operational activities, such as those in human resources, economic planning or sales, technical office staff, etc.	✓Clearly defining the types of behaviour that the organization deems acceptable and unacceptable (for example, in the framework of a code of ethics) ✓Knowledge of the safety risks caused by individual actions and the operations/activities of the air operator ✓Promoting trust between senior management and staff when addressing aspects related to safety and the measures proposed to improve it	✗Lack of an ethical framework of action marking the distinction between acceptable and unacceptable behaviour ✗A generalized focus on punishment. Employees are systematically and rigorously punished for mistakes. ✗Withholding of relevant information on safety. ✗Lack of knowledge of the safety risks caused by individual actions or by the operations/activity of the air operator
Participation		
The organization must encourage the entire staff to participate in improving safety, facilitating the understanding of the impact of individual activities and actions on safety. It must be acknowledged that safety is not someone else's responsibility, but rather that the entire staff must participate in safety-related activities, such as surveys, training, awareness-raising campaigns, safety reports, etc. Moreover, the organization must take the staff into account when making changes to systems and procedures, considering staff needs and contributions, favouring participation in change processes. The employees and operating staff contribute to safety through their participation, fostering trust in reporting at all levels.	✓Promoting just culture, in an environment in which safety reporting is open and protected ✓Establishing channels of information that facilitate reporting and staff access to information ✓Active knowledge transfer and training on safety (lessons learned). ✓Climate of trust between senior management and staff when addressing aspects related to safety and the measures proposed to improve it	✗Seeking to identify blame for safety incidents, instead of seeking solutions ✗Lack of channels facilitating knowledge transfer or training on safety ✗Promoting an atomistic view of the activity, limiting analysis teams and staff participation in these teams ✗Lack of knowledge or interest of the organization in advances regarding safety ✗Lack of knowledge of the safety risks caused by individual actions or by the operations/activity of the air operator

SAFETY CULTURE MODEL PROPOSED BY AESA

Relationship between Safety Management System and Safety Culture

Safety Management System (SMS) is the capacity-building tool used by organizations to acquire safety information (data capture and processing systems), to undertake analyses aimed at preventing accidents and incidents (risk management processes) and to apply mitigating measures (allocation of responsibilities, accountability, and decision-making processes). The cycle is completed with the establishment of a mechanism to measure safety performance (safety assurance), enabling verification of the effectiveness of any improvements made.

The gradual implementation of SMS in organizations has made clear the importance of developing, in parallel, the safety culture within organizations. In this context, the SMS and the safety culture are mutually dependent elements. The SMS is the material resource required to achieve the organization's safety objectives while the safety culture represents the staff's commitment to achieving them.

Aeronautical organizations are socio-technical systems involving people and technology, and therefore the SMSs must consider the performance of both these two principal components: the human element and technology. For this reason, SMSs require an appropriate safety culture to be truly effective. For example, an appropriate safety culture will favour the existence of a robust process for reporting safety incidents, weaknesses, or hazards, which will facilitate subsequent analysis by the SMS for decision-making purposes.

The organizational nexus between the SMS and the safety culture is necessarily the senior management, which must establish the safety policy and objectives, based on their own safety leadership or mindful leadership, which will be promoted through their own safety commitment. The safety policy must be clear, and it must be the basis of the safety culture. The safety policy is implemented in the organization through the safety culture, which entails putting these activities into practice at all hierarchical levels within the organization.

All the elements of the SMS may be easily linked to the elements of the safety culture model proposed. Insufficient implementation of one of the safety culture elements will thus diminish the effectiveness of the corresponding elements of the SMS.

SAFETY CULTURE MODEL PROPOSED BY AESA

Relationship between the SMS and the Safety Culture

SMS elements		Safety Culture elements: Organization's commitment	Resources	Just Culture	Risk awareness and management	Teamwork	Comm and training	Responsi-bility	Participation
Safety Policy and Objectives	1.1 Management commitment	✓	✓	✓	✓	✓	✓	✓	✓
	1.2 Safety accountability and responsibilities	✓	✓		✓		✓	✓	
	1.3 Appointment of key safety staff	✓	✓			✓	✓	✓	
	1.4 Coordination of emergency response planning	✓			✓	✓	✓	✓	
	1.5 SMS documentation	✓	✓	✓	✓		✓		
Safety risk management	2.1 Hazard identification		✓	✓	✓	✓	✓	✓	✓
	2.2 Safety risk assessment and mitigation		✓	✓	✓		✓		
Safety assurance	3.1 Safety performance monitoring and measurement		✓		✓		✓		
	3.2 Management of change	✓	✓		✓	✓	✓	✓	✓
	3.3 Continuous improvement of the SMS	✓	✓	✓	✓	✓	✓		✓
Safety promotion	4.1 Training	✓	✓	✓	✓	✓	✓		✓
	4.2 Safety communication	✓		✓	✓	✓	✓		✓

Mindful leadership

The safety leadership or mindful leadership of the organization's director is related to the decision-making processes and leadership within the organization. Senior management is the organizational nexus between the Safety Management System (SMS) and the safety culture of the organization, which is established through the safety policy and objectives based on senior management's own safety leadership. This is what is commonly known as safety intelligence or mindful leadership. It represents the assimilation and adoption in practice of the safety culture in the organization, which the director promotes through perceptible commitment and leadership.

Key aspects of this mindful leadership are as follows:

- Knowledge of safety and its interaction with production variables, and the establishment of priorities
- Social skills, empathizing and properly perceiving the targets, forecasting, contribution and needs of the people who work in the organization
- Troubleshooting capacities

Maturity of the safety culture

The implementation and strengthening of an appropriate safety culture in the organization, through the three fundamental components described above (elements of the safety culture, relationship between the Safety Management System and safety culture, and mindful leadership), follow an evolution with three distinct phases: compliance, performance, and continuous improvement.

During the compliance phase, safety is defined in procedural terms as a consequence of regulatory compliance, and the organization considers that it ensures safety when it complies with regulatory requirements, taking corrective actions after the occurrence of any incident.

During the performance phase, safety is considered in the organization's decision-making processes. After an incident, the direct or immediate causes are identified, but organizational processes are also reviewed in case they might also have played a part in the incident. At this phase, trust is placed in the quantitative indications provided by data acquisition systems and statistical models, and the existence of a just culture environment means that personnel feel they will be supported if they report safety events and/or weaknesses.

In the continuous improvement phase, the organization continually seeks potential safety defects, and a fluid channel of communication exists between operational staff, supervisors, and senior management. Continuous improvement of safety is understood as an investment, and incidents—including those without consequences—are analysed from every perspective. This phase is characterized by a consistent attitude of perpetual vigilance as regards safety, thereby precluding all complacency. It is assumed that any highly efficient organization may also suffer from defects that could go unnoticed.

Measuring the safety culture

In the safety culture model proposed, the measurement of the strengthening of the safety culture in each of the mentioned phases will be monitored using performance indicators, which provide alerts regarding possible plateauing or deviations from a given pattern.

Consequently, the aim of the measurements is to identify strengths and weaknesses in the organization's safety culture, enabling identification of the status, evolution, current trend and forecast of the organization's maturity and the design of improvement levers in those areas where they are needed.

The proposed method for conducting the measurements is to use surveys aimed at the staff of the organization, assessing their involvement and their perception of how committed the organization and its senior management are to safety.

Appendix I to this document proposes several tools for measuring the safety culture, which consist of staff surveys and an interview with the accountable manager.

Analysing the results and proposing improvements to the safety culture

Once the safety culture measurements have been made, the person responsible for this measurement must analyse the results obtained, in order to identify the weaknesses and strengths detected.

With the aim of facilitating the subsequent analysis, safety culture performance indicators can be defined based on the results of the closed-ended questions and of the valuation of the open-ended questions, so that they clearly show which aspects of the safety culture must be improved upon within the organization.

To carry out this analysis, the person responsible for measuring the safety culture may be assisted by a multidisciplinary team representing all the groups that answered the survey, to facilitate the establishment of connections between the weaknesses detected and their root cause, as well as the design of improvement mechanisms (known as levers).

Finally, the person responsible for this measurement will present to the accountable manager the results of the surveys and the analysis carried out, as well as the levers proposed to remedy the weaknesses detected in the safety culture. This manager will validate the solutions they consider necessary to improve the safety objectives, pursuant to the business plan and responding to their staff's professional expectations.

Reassessment of safety culture

Once an appropriate period of time has passed since the implementation of the measures proposed to promote the safety culture as a result of the previous assessment, the level of safety culture within the organization will be reassessed. This assessment will seek to verify whether the measures implemented have been effective and to identify any new weaknesses and strengths in the organization.

This reassessment may be accompanied by performance indicators that are external to the safety culture, to measure how the development of the safety culture in organizations helps to improve results in terms of efficiency and safety. For example, the volume of safety reports issued by different groups within the organization, the volume of highly serious safety incidents, delays or cancellations due to technical reasons, etc.

Safety culture, like other cultures, evolve over time and with each organization's circumstances, and must therefore be subject to continuous review.

PILOT PROGRAMME OF SAFETY CULTURE

AESA will develop a Pilot Programme in collaboration with the operators that volunteer to participate, with the aim of clearly defining the tools proposed in this White Paper and of proposing measures to improve the safety culture on the basis of the air operator's experience.

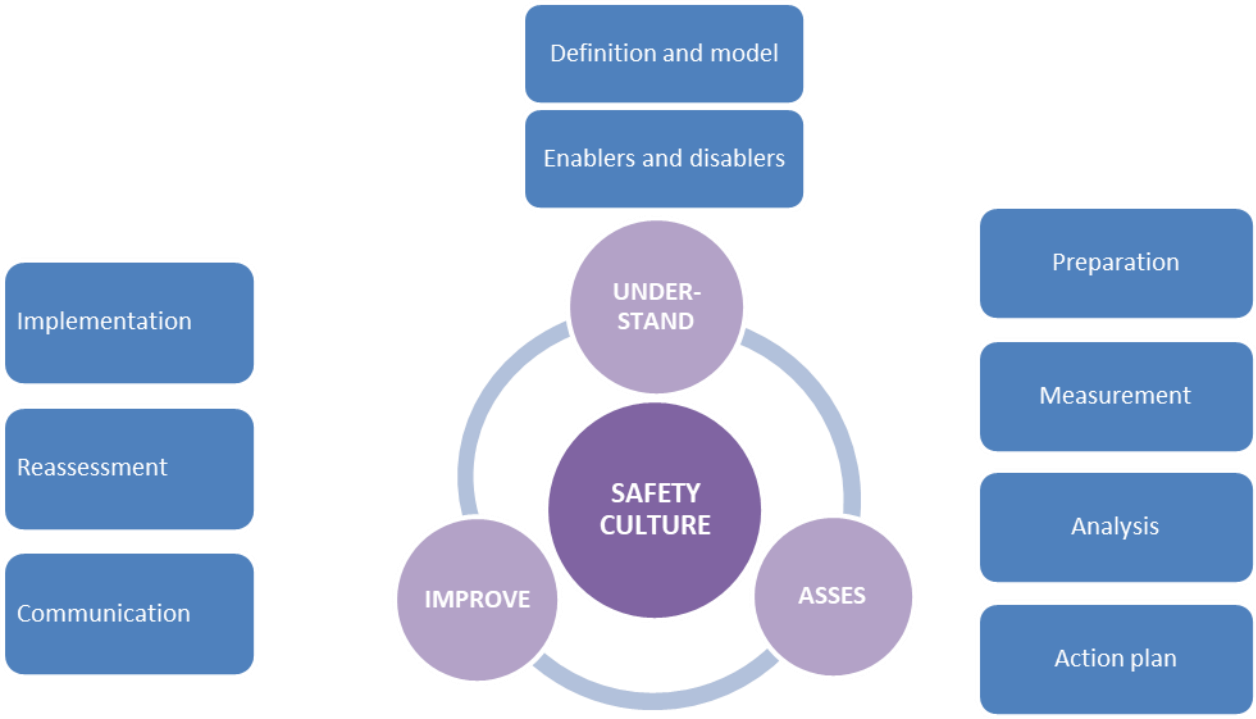
This Pilot Programme will allow the definition, based on consensus and experience, of a model that enables the identification of the maturity, strengths and weaknesses of the safety culture existing within an operator, considering the concepts developed and the tools proposed.

Consequently, the main objective of this Pilot Programme will be to adapt and optimize the model and the tools proposed to identify the maturity of the safety culture within air operators, through the strengths and weaknesses identified. Additionally, analysis will be conducted of the measures necessary to improve the safety culture where weaknesses are identified, learning lessons from the application of this model in air operators, and including them in the new revised edition of this White Paper.

These activities will thus culminate with the proposal to the other operators of a safety culture measurement system and of tools to promote this culture, for their effective incorporation into their Safety Management Systems.

Pilot programme

Those operators that volunteer to do so may participate in an implementation pilot programme in their organizations, which will be structured into the following phases:



- Phase 1: Understanding:
  - ✓ Safety culture definition and model: the staff responsible for the SMS will be given training in methods, processes and techniques to strengthen the safety culture
  - ✓ Presentation and explanation of the tools proposed, and adaptation to the organization's specific circumstances

- ✓ Use of the specific data collection, information, assessment, and analysis tools to implement valuation metrics
- ✓ Identification of facilitators and obstacles

Phase 2: Assessing:

- ✓ Preparation of the assessment: Official support for the pilot programme from the accountable manager, determination of the timeframe for the measurement and official presentation of the plan to the entire staff.
- ✓ Measurement of the safety culture: Measurement of the safety climate in which the surveys are conducted, with the option of creating supervisor discussion groups by operational area. Interim meeting with the accountable manager to provide an update on the survey, and compilation of evidence.
- ✓ Analysis of information and data included in the open-ended quetions and interviews: identification of strengths and weaknesses, relationship with the safety performance of the organization, valuation of the maturity of the safety culture, and development of safety culture indicators.
- ✓ Presentation of the report containing the results: statistical analysis and establishment of conclusions.
- ✓ Development of an action plan: transposition of the conclusions into recommendations, materialization of the recommendations into a set of actions and presentation of the improvement action plan.

Phase 3: Improving:

- ✓ Implementation of the improvement action plan
- ✓ Communication of results
- ✓ New assessment process

REFERENCES

The following reference material on safety culture was considered in preparing this White Paper:

ORGANIZATION/ STATE	TYPE OF DOCUMENT	TITLE
ICAO	Annex	Annex 19 – Safety Management
ICAO	Manual	Doc 9859 – Safety Management Manual
Spain	Programme	PESO – Spanish State Safety Programme
Spain	Plan	PASO – Spanish Safety Action Plan
AESA	Guide	Safety Management Systems (SMS) Guide
AESA	Guide	Just Culture Guide
EASA	Plan	EPAS – European Plan for Aviation Safety 2022-2026
CANSO	-	Safety Culture Definition and Enhancement Process
SMICG	-	Safety Culture for Effective Safety Management
Future Sky Safety	Study	Mapping safety culture onto processes and practices: the Safety Culture Stack approach

APPENDIX I: PROPOSED TOOLS FOR MEASURING THE SAFETY CULTURE

This appendix proposes tools for measuring the safety culture within organizations. This list must in all cases be reviewed before application for adaptation to the operational reality of each organization.

Proposed measurement model

The measurement model proposed consists of a self-assessment plan, which must have the support of the accountable manager, and which must be duly communicated to staff. The individual responsible for this model may also be the safety manager.

The measurements are based on the establishment of relationships between the twelve elements of the Safety Management System and the eight components defined for the safety culture. These measurements will be made using closed-ended and open-ended questions, which will be targeted at staff involved in activities related to safety (flight crews, cabin crews, continuing airworthiness management staff, flight operations staff (flight dispatchers, planners), ground handling staff, safety management and compliance monitoring staff).

Relationship between the SMS and the Safety Culture

	SMS elements	Safety Culture elements							
		Organization's commitment	Resources	Just Culture	Risk awareness and management	Teamwork	Comm and training	Responsi-bility	Participation
Safety Policy and Objectives	1.1 Management commitment	✓	✓	✓	✓	✓	✓	✓	✓
	1.2 Safety accountability and responsibilities	✓	✓		✓		✓	✓	
	1.3 Appointment of key safety staff	✓	✓			✓	✓	✓	
	1.4 Coordination of emergency response planning	✓			✓	✓	✓	✓	
	1.5 SMS documentation	✓	✓	✓	✓		✓		
Safety risk management	2.1 Hazard identification		✓	✓	✓	✓	✓	✓	✓
	2.2 Safety risk assessment and mitigation		✓	✓	✓		✓		
Safety assurance	3.1 Safety performance monitoring and measurement		✓		✓		✓		
	3.2 Management of change	✓	✓		✓	✓	✓	✓	✓
	3.3 Continuous improvement of the SMS	✓	✓	✓	✓	✓	✓		✓
Safety promotion	4.1 Training	✓	✓	✓	✓	✓	✓		✓
	4.2 Safety communication	✓		✓	✓	✓	✓		✓

These surveys begin with generic questions that enable a global analysis of the general maturity and climate of safety within the organization. They then become more specialized, with the aim of addressing the specific circumstances of each different area and thus tackling the specific operational problems faced by air operators.

The surveys are divided into two parts:

1) Part one: open questions relating to the organization's current safety performance, to enable a qualitative valuation and the identification of evidence facilitating a global assessment of the level of maturity of the safety culture.
2) Part two: designed based on the eight components of the safety culture model. Each element is described in a statement that the survey respondent must rate quantitatively on a scale of 0 to 5, expressing the degree to which they agree with it.

In addition, the surveys will be supplemented by an interview with the accountable manager. This interview may be conducted by the plan manager, or by the safety manager. The questions will focus on the organization's safety policy and objectives, to gauge their contribution to the maturity of its safety culture. The aim is to obtain information regarding the safety leadership of the accountable manager and how they exercise their leadership to implement the organization's safety policy and to achieve the proposed objectives.

Analysis of results and proposals for promoting the safety culture

Once the safety culture measurements have been made, the person responsible for this measurement must analyse the results obtained, in order to identify the weaknesses and strengths detected.

With the aim of facilitating the subsequent analysis, safety culture performance indicators can be defined based on the results of the closed-ended questions and the assessment of the open-ended questions, so that they clearly show which aspects of the safety culture must be improved upon within the organization.

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To carry out this analysis, the person responsible for measuring the safety culture may be assisted by a multidisciplinary team representing all the groups that answered the survey, to facilitate the establishment of connections between the weaknesses detected and their root cause, as well as the design of improvement mechanisms (known as levers).

Finally, the person responsible for this measurement will present to the accountable manager the results of the surveys and the analysis carried out, as well as the levers proposed to remedy the weaknesses detected in the safety culture. This manager will validate the solutions they consider necessary to improve the safety objectives, pursuant to the business plan and responding to their staff's professional expectations.

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Interview with the accountable manager

PILOT PROGRAM OF SAFETY CULTURE	
INTERVIEW WITH THE ACCOUNTABLE MANAGER	
A - Safety knowledge	
1. *Could you summarize the air operator's safety policy and objectives?*	
2. *Does the safety department form part of the organization's senior management structure? To whom does this department report? Does it report to you directly?*	
3. *Do you consider that your operator's Safety Management System is working as effectively as possible?*	
4. *Do you have any plan to improve or optimize the SMS?*	
5. *What resources and budget are allocated to the SMS?*	
6. *Could you define in two words what you understand by the term 'safety culture'?*	
7. *Can you tell us three strengths and three weaknesses of your air operator's safety culture?*	
8. *What are the five critical safety risks of your air operator?*	
9. *What is being done with respect to each one? What mitigating measures are being implemented?*	
10. *What is currently the most significant operational threat for your operator, according to the safety performance indicators?*	
11. *What are the three priority areas related to human factors and safety in your organization?*	
12. *Of all the incidents recorded by your air operator that have had a negative impact on safety, which do you most regret or which has caused you the most unease?*	
13. *Of all the accidents or incidents, whether external or internal to your operator, which you have witnessed during your professional career, tell us two from which you have learned the most important lessons to apply in your management of the safety culture.*	
14. *If you had to identify your principal concern about safety in aviation at a systemic level, what would it be?*	
B – Troubleshooting	
1. *When you prepare a new plan or business activity for the operator, is any analysis conducted regarding the potential safety impact of the changes to be made?*	
2. *What are the minimum criteria that should be considered when hiring staff to generate a stable safety environment?*	
3. *Do you subcontract any operational staff through intermediary companies, brokers or temporary employment agencies?*	
4. *How are resources allocated to the safety department? Do you remember what volume of resources was allocated for the year in progress?*	
5. *What method do you use to determine the operational staff's thoughts on safety to inform your decision-making process?*	
6. *Have you ever sent a message to the operational staff requesting their participation in the air operator's safety reporting system?*	
7. *When was the last time that you met with the safety manager? How often do you usually meet?*	
8. *Does the safety manager report to the board of directors on the performance of safety indicators and on critical incidents?*	
9. *Do you consult with the air operator's Safety Committee?*	
10. *Do you participate in any external forums in which you discuss safety with actors from outside the aeronautical system?*	

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PILOT PROGRAM OF SAFETY CULTURE		
INTERVIEW WITH THE ACCOUNTABLE MANAGER		
C – Social skills		
1.	*Is safety on the agenda of every board of directors' meeting? If this is not the case, how often is safety on the agenda of board of directors' meetings?*	
2.	*Does the operator currently have a specific programme of investments for improving safety?*	
3.	*In the last order for aircraft submitted by the operator, do you remember what safety equipment beyond that required by law your operator requested that the aircraft be fitted with?*	
4.	*Has the operator formalized a public Just Culture Declaration with the operational staff's representatives?*	
5.	*What do you understand by the term 'just culture'?*	
6.	*How have you implemented a just culture in the operator?*	
7.	*Have you encountered any difficulties in this regard?*	
8.	*Could you provide a positive example of just culture in the operator?*	
9.	*How often do you address the staff for the purpose of conveying a message on safety?*	
10.	*What is your strategy for actively involving the operational staff in actively contributing to improving safety?*	
11.	*Do you regularly conduct safety surveys to determine the operational staff's thoughts on this matter?*	
12.	*Have you established a programme to reward exceptional handling of safety situations by staff? If this is the case, when was the last time such exceptional behaviour was acknowledged?*	

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Cross-cutting survey: valid for all staff

PILOT PROGRAM OF SAFETY CULTURE	
STAFF SURVEY	
Demographic data	
Operating base	
Place of residence	
Nationality	
Age	
Level of education	
Air operator	
Operational position	
Type of aircraft with which you work	
Management or senior management tasks performed	
Experience in aviation (years and positions)	
Number of years with the air operator	
Number of years in your current position	
Type of contract	
Full-time or part-time contract	
If you are on a part-time contract, what percentage of full-time hours do you work on average?	
Open questions	
1. *When was the last time you were involved in a safety incident?*	
2. *Could you describe it?*	
3. *Did you report the incident to your operator using the channels established for that purpose?*	
4. *Did you receive any kind of feedback that you considered satisfactory?*	
5. *In your opinion, was the incident properly investigated, and were all contributing factors identified?*	
6. *Would you report another incident in the future?*	
7. *Do you consider that the channel for reporting incidents is easily accessible to staff?*	
8. *Have you ever received any kind of negative response from the organization because of events you have reported through the reporting system? If so, what kind of response?*	
9. *What do you believe is the priority area of risk for your operator?*	
10. *Has a safety programme been implemented in that area?*	
11. *If you could propose a safety improvement to your operator, what would it be?*	
12. *If you could ask the aviation safety authorities to undertake a specific action to improve safety in your operator, what would it be?*	

APPENDIX I: PROPOSED TOOLS FOR MEASURING THE SAFETY CULTURE

PILOT PROGRAM OF SAFETY CULTURE						
STAFF SURVEY						
1. Organizational commitment	*Degree of agreement*	**1**	**2**	**3**	**4**	**5**
1.1. I consider that senior management has a real commitment to safety.						
1.2. My immediate boss is committed to safety.						
1.3. My immediate boss takes actions in relation to the safety incidents that we report.						
1.4. My immediate boss would always support me if I had a safety problem.						
1.5. I consider safety rules and procedures as a priority even when there is a high workload.						
1.6. When a safety problem is detected during routine work, the air operator takes effective actions within a reasonable timeframe.						
1.7. Staff regularly receive messages from senior management positively promoting safety.						
2. Allocation of resources	*Degree of agreement*	**1**	**2**	**3**	**4**	**5**
2.1. I consider that the air operator provides me with the necessary resources to perform my tasks safely.						
2.2. I consider that I have been properly trained to do the work assigned to me.						
2.3. Whenever there is a relevant change in daily activity, we receive training that is appropriate and adequate in time, form, and content.						
2.4. We have sufficient qualified staff to do our work safely.						
2.5. We have the necessary equipment to do our work safely.						
2.6. We receive sufficient support from the safety department and its manager.						
2.7. I feel comfortable and capable of performing my tasks with the equipment available to me.						
2.8. I believe that the workload is reasonable most of the time.						
2.9. In general, I am happy with my working conditions.						
2.10. In general, I feel valued and that the company cares about me.						
2.11. The activities are planned appropriately and considering the time needed to guarantee safety.						
2.12. The most complex tasks are performed by the most experienced and best-qualified members of staff.						
2.13. We receive specific training to be prepared to perform special tasks or deal with emergencies.						
3. Just culture	*Degree of agreement*	**1**	**2**	**3**	**4**	**5**
3.1. People who report safety incidents are treated justly and honestly.						
3.2. The reporting of safety incidents or problems is encouraged.						
3.3. When we report a safety matter, we receive timely and appropriate feedback.						
3.4. I am satisfied with the level of confidentiality of the reporting and investigation processes.						
3.5. I feel prepared to speak to my immediate boss whenever an unsafe situation arises.						
3.6. I am informed about the main kinds of incidents affecting safety, both in my operator and in the sector.						
3.7. The "normal errors" that arise on a day-to-day basis are reported and assessed to prevent their recurrence, rather than to apportion blame.						

APPENDIX I: PROPOSED TOOLS FOR MEASURING THE SAFETY CULTURE

PILOT PROGRAM OF SAFETY CULTURE					
STAFF SURVEY					
3.8. Staff have access to and can comment openly on accidents/incidents and the subsequent investigations and lessons learned.					
3.9. After any serious safety accident/incident, the air operator undertakes a thorough investigation to identify the real cause and implement effective solutions.					
3.10. Staff involved in incidents or occurrences are supported by the organization's senior management.					
3.11. The reporting of incidents or occurrences leads to improvements in safety in this organization.					
4. Risk awareness and management *Degree of agreement*	**1**	**2**	**3**	**4**	**5**
4.1. In our day-to-day work, we are obliged to deviate from established procedure to get the tasks done.					
4.2. The bosses pay no attention to the risks associated with our tasks and are only concerned with getting the work done.					
4.3. I often feel obliged to assume safety risks that make me feel uncomfortable.					
4.4. Certain safety problems exist, and have always existed, about which nothing can be done.					
4.5. We do not receive regular information on the most critical safety areas.					
4.6. Changes in the organization, systems and procedures are properly assessed to determine the safety risks.					
5. Teamwork *Degree of agreement*	**1**	**2**	**3**	**4**	**5**
5.1. My colleagues are committed to safety.					
5.2. I trust the people I work with to perform their tasks properly.					
5.3. Every worker in this air operator considers that safety is their personal responsibility.					
5.4. My team knows the procedures to perform their tasks and has received the proper training to carry them out correctly.					
5.5. In my team, a dim view is taken of attitudes or behaviours that could jeopardize safety.					
5.6. If I witnessed one of my colleagues doing something unsafe, I would talk to them about it.					
5.7. There are individuals with whom I do not wish to work because of their negative attitude towards safety.					
5.8. The workers of other organizations who render subcontracted services are aware of how their work affects safety.					
6. Safety communication and training *Degree of agreement*	**1**	**2**	**3**	**4**	**5**
6.1. The air operator provides training that enables us to learn lessons from safety incidents or their investigation.					
6.2. The air operator periodically undertakes campaigns of good practices and experiences to raise awareness about safety problems, their analysis and resolution within the organization					
6.3. Information on safety changes made by the air operator is communicated clearly to staff.					
6.4. I have easy access to information regarding safety incidents or occurrences involving the air operator.					
6.5. As regards safety, in this air operator there is good communication from the top down and vice versa.					
6.6. The workers of this air operator share information regarding safety.					
6.7. In this air operator, the staff do not hesitate to consult with a superior if they believe that a procedure or decision might lead to an unsafe situation.					
6.8. The bosses themselves encourage their teams to question any decision they believe could have an impact on safety.					
6.9. The air operator conducts periodic safety surveys to determine its staff's thoughts on the matter.					

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PILOT PROGRAM OF SAFETY CULTURE					
STAFF SURVEY					
6.10. The air operator adequately reports future plans and how they will affect us. This enables us to be prepared for changes and prevent any impact on safety.					
6.11. I have access to and read incident reports that are relevant to my work					
7. Responsibility *Degree of agreement*	**1**	**2**	**3**	**4**	**5**
7.1. I think that my job is important and that if it is not done well this could lead to safety problems or safety gaps.					
7.2. Safety is taken very seriously in this air operator and anyone who does not follow the official policy is called to account.					
7.3. In this air operator, all staff, irrespective of their positions, are required to be accountable for their actions.					
7.4. Senior management and supervisors lead by example by assuming their responsibilities.					
7.5. Any staff member who regularly assumes unacceptable risks may be disciplined or admonished.					
7.6. The air operator has established clear rules of action in response to safety incidents. The rules are focused on finding solutions and not on blaming operational staff.					
8. Participation *Degree of agreement*	**1**	**2**	**3**	**4**	**5**
8.1. I participate in safety activities, projects and campaigns.					
8.2. My participation in safety activities, projects and campaigns is adequate.					
8.3. The members of this air operator work as a team to achieve a high and sustainable level of safety.					
8.4. Other people in this organization understand how my work contributes to safety.					
8.5. When a relevant change is made that affects our routine work, our concerns are heard and taken into account.					
8.6. Procedures and equipment/systems are adapted to tasks. If we encounter weaknesses, the air operator takes our observations into account to implement improvements.					
8.7. We are sufficiently involved in changes in procedures and/or systems in the organization.					

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Specific surveys I - Flight crews

PILOT PROGRAM OF SAFETY CULTURE					
SPECIFIC SURVEY I – FLIGHT CREWS					
Degree of agreement	**1**	**2**	**3**	**4**	**5**
OP.1. We have procedures whose intent or purpose is focused more on regulatory compliance than on safety or usefulness.					
OP.2. The Standard Operating Procedures associated with my work are adequate to guarantee safe operations.					
OP.3. The staff of this air operator do not hesitate to consult with their superiors if they believe that operational decisions might be unsafe (for example, co-pilots with commanders).					
OP.4. When an approach is not stabilized within the established parameters, any pilot may call a go-around, and the pilot flying (PF), will execute this command immediately.					
OP.5. The proper training is provided when new systems and procedures are implemented.					
OP.6. I have had sufficient training to understand the procedures associated with my work.					
OP.7. I have sufficient opportunities to practice my manual flying skills on a regular basis.					
OP.8. I feel uncomfortable flying the aircraft manually.					
OP.9. The scheduling of flight duty periods is frequently only just within the legal limits, with extremely short layovers.					
OP.10. This air operator schedules inadequate layovers and insufficient time for pre-flight paperwork, meaning that pilots have to arrive ahead of schedule to sign the pre-flight paperwork and frequently end their rotations later than scheduled.					
OP.11. The air operator frequently schedules minimum rest periods, with little margin, between rotations on consecutive days.					
OP.12. The air operator takes flight crew members' opinions into account with respect to the increase in activity needed to be able to complete rotations.					
OP.13. The air operator penalizes those cases in which, at the commander's discretion, rotations are not completed to prevent flight crew members from having to work overtime on the flight returning to base.					
OP.14. The air operator often avails of the "increased activity" option on flights delayed by different causes, to leave the base, instead of requesting a change in crew (standby).					
OP.15. The flight crews in this air operator frequently work while excessively fatigued.					
OP.16. I feel comfortable reporting that I am fatigued during operations, if necessary.					
OP.17. Fatigue is taken very seriously by this air operator.					

APPENDIX I: PROPOSED TOOLS FOR MEASURING THE SAFETY CULTURE

Specific surveys II – Continuing airworthiness management staff

PILOT PROGRAM OF SAFETY CULTURE						
SPECIFIC SURVEY II – CONTINUING AIRWORTHINESS MANAGEMENT STAFF						
	Degree of agreement	**1**	**2**	**3**	**4**	**5**
AW.1.	*The operator decides the final configuration of the aircraft, equipment, etc., prioritizing safety over production.*					
AW.2.	*The operator keeps abreast of all non-mandatory directives and amendments (service bulletins and others) affecting aircraft, engines and equipment.*					
AW.3.	*Safety is prioritized over cost in the operator's management of continuing airworthiness.*					
AW.4.	*In managing continuing airworthiness, the operator maintains an adequate flow of information with manufacturers and the aviation safety authorities.*					
AW.5.	*In managing continuing airworthiness, the operator also undertakes proper management of files, manuals and document revisions.*					
AW.6.	*In managing continuing airworthiness, the operator prioritizes service bulletins on safety over those on production.*					
AW.7.	*In managing continuing airworthiness, the operator takes account of the ageing of equipment and aircraft.*					
AW.8.	*Tasks are defined in clear and concise procedures that enable problems to be effectively remedied.*					
AW.9.	*Tasks times are properly dimensioned into person-hours.*					
AW.10.	*I have access to the tools and the space I need to perform my tasks.*					
AW.11.	*Senior management promotes and respects the established rest periods.*					
AW.12.	*It is not usual to have to work a double shift or do overtime.*					
AW.13.	*We receive continuous training that enables us to work efficiently on new tasks, or with new tools or types of aircraft.*					
AW.14.	*We are aware of the implications and risks associated with our work as regards the safety of the future operation of the aircraft.*					
AW.15.	*The air operator encourages staff to immediately discuss uncertainties or possible errors detected during their tasks with their bosses or managers.*					
AW.16.	*Spare parts are always available when a breakdown or unscheduled maintenance arises.*					