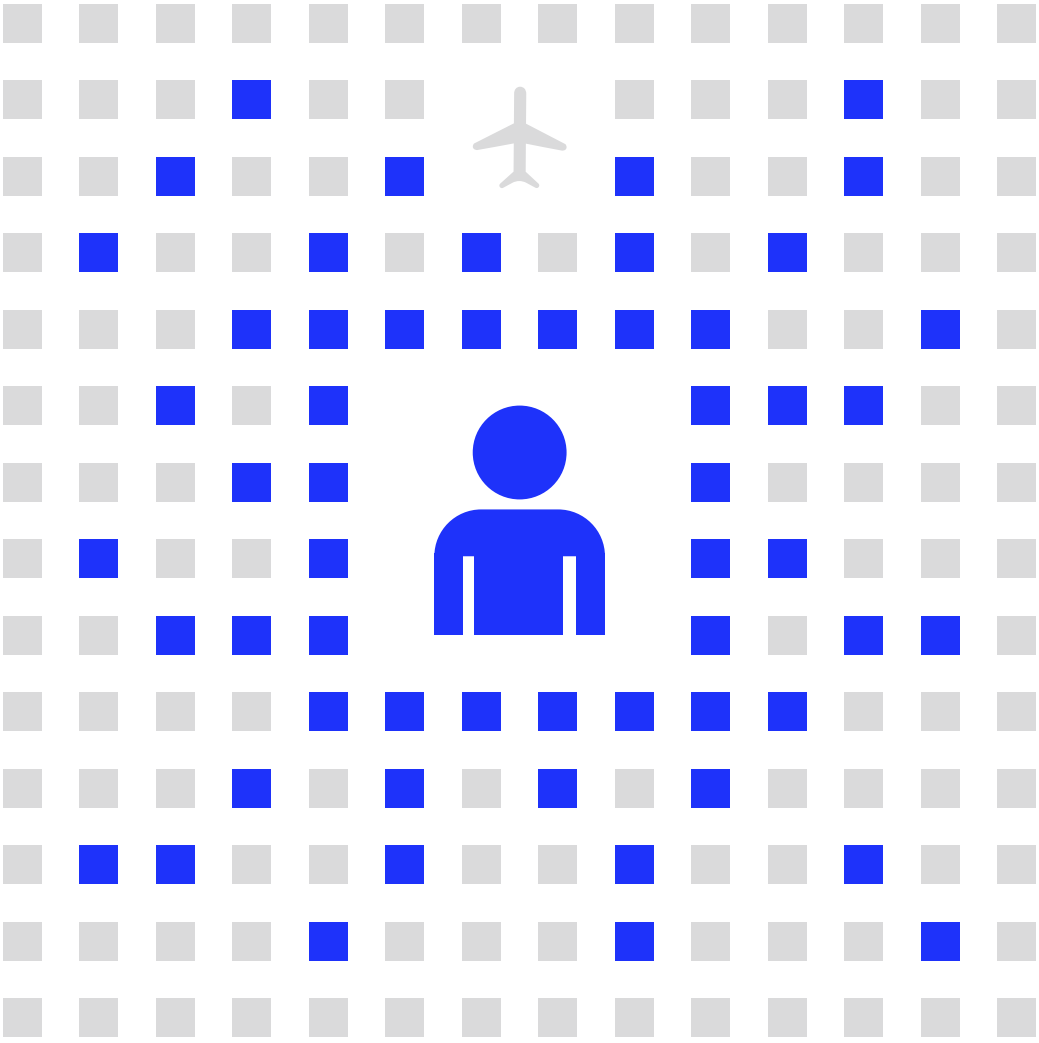
Human Factors

Global Survey for Airlines



DISCLAIMER

The content, data and information (the "Content") contained in this publication ("Publication"), is provided for information purposes only and is made available to you on an "AS IS" and "AS AVAILABLE" basis.

IATA has used reasonable efforts to ensure the Content of this Publication is accurate and reliable. We, however, do not warrant, validate, or express any opinions whatsoever as to the accuracy, genuineness, origin, tracing, suitability, availability or reliability of the sources, completeness, or timeliness of such Content. IATA makes no representations, warranties, or other assurances, express or implied, about the accuracy, sufficiency, relevance, and validity of the Content. IATA's observations are made on a best efforts and non-binding basis, and shall not be deemed to replace, interpret, or amend, in whole or in part, your own assessment and evaluation or independent expert advice. Nothing contained in this Publication constitutes a recommendation, endorsement, opinion, or preference by IATA.

IATA has no obligation or responsibility for updating information previously furnished or for assuring that the most up-to-date Content is furnished. IATA reserves the right to remove, add or change any Content at any time. Links to third-party websites, reports or information directories are offered as a courtesy. IATA expresses no opinion on the content of the websites of third parties and does not accept any responsibility for third-party information. Opinions expressed in advertisements appearing in this Publication are the advertiser's opinions and do not necessarily reflect those of IATA. The mention of specific companies or products in advertisements does not imply that they are endorsed or recommended by IATA in preference to others of a similar nature which are not mentioned or advertised.

This Publication is not intended to serve as the sole and exclusive basis for assessment and decision making and is only one of many means of information gathering at your disposal. You are informed to make your own determination and make your own inquiries as you may deem necessary and suitable. You shall independently and without solely relying on the information reported in this Publication, perform your own analysis and evaluation regarding the nature and level of information you may require, based upon such information, analyses, and expert advice as you may deem appropriate and sufficient, and make your own determination and decisions pertaining to the subject matter under consideration.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, IATA DISCLAIMS ANY REPRESENTATION OR WARRANTY (I) AS TO THE CONDITION, QUALITY, PERFORMANCE, SECURITY, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THIS PUBLICATION AND CONTENT; OR (II) THAT THE ACCESS TO OR USE OF THIS PUBLICATION (INCLUDING ANY AUTOMATED FEEDS OR OTHER DELIVERY MODES) OR ANY CONTENT SUPPLIED OR CONTRIBUTED TO THIS PUBLICATION BY THIRD PARTIES, WILL BE UNINTERRUPTED, ACCURATE, THE MOST UP TO DATE, COMPLETE OR ERROR-FREE. IATA EXCLUDES ALL LIABILITY (TO THE EXTENT PERMITTED BY APPLICABLE LAW) FOR ANY COSTS, LOSSES, CLAIMS, DAMAGES, EXPENSES OR PROCEEDINGS OF WHATEVER NATURE INCURRED OR SUFFERED BY YOU OR ANY OTHER PARTY ARISING DIRECTLY OR INDIRECTLY IN CONNECTION WITH THE USE OF THIS PUBLICATION OR ANY CONTENT CONTAINED OR ACCESSED THEREFROM, OR DUE TO ANY UNAVAILABILITY OF THIS PUBLICATION IN WHOLE OR IN PART.

Contents

Setting the Stage

From the ICAO definitions (*Document 10151*) **Human Performance (HP)** refers to how people perform their tasks. HP represents the human contribution to system performance. **Human Factors (HF)** are concerned with the application of what we know about human beings, their abilities, characteristics, and limitations, to the design of equipment they use, environments in which they function and jobs they perform.

Human Factors is an interdisciplinary area that focuses on a range of different topics, including ergonomics, workplace safety, human error, product design, human capability, and human-technology interaction. The integration of the knowledge from all these different scientific disciplines is meant to enhance safer and better performances in the workplaces. Its goal is to reduce errors by addressing how humans sense information, think, make decisions, act and behave. Since human error is the largest causal factor in accidents, it is altogether fitting for the aviation industry to devote special attention to solving Human Factors problems.

Traditionally, the focus of human performance has been on, for example, accidents and incidents investigation, air safety reports and mandatory safety reports, Crew Resource Management (CRM) or cockpits design. Each of these has been addressed by different departments within an organisation. While this 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 in a positive and resilient manner.

At IATA, we aim to understand the global implementation of Human Factors programs by airlines and facilitate the sharing of the best practices across the industry. This Paper compiles and disseminates these best practices.

We invite you to dive into the insights we've gathered and hope you find them as interesting and inspiring as we did. Feel free to share the contents with your colleagues and community, and don't hesitate to send us your thoughts and feedback.

Thank you very much.

Antonella Cavacini
Human Factors Manager
IATA
humanfactors@iata.org

Key Insights

The Paper presents the results of the global survey conducted by IATA between October 2024 and February 2025, focusing on Human Factors (HF) and Human Performance (HP) programs within airlines worldwide. The survey aimed to understand the implementation level of these programs, share conclusions and best practices.

The substantial number of responses underscore the credibility and relevance of the survey findings, providing valuable insights into the aviation industry's Human Factors and Human Performance management.

This survey provides a detailed overview of how airlines are addressing Human Factors and Fatigue Management, reinforcing the importance of these programs in ensuring a good Safety performance in aviation.

Purpose of the Survey

1. Understand the implementation of Human Factors programs in airlines globally.
2. Share the conclusions.
3. Highlight best practices anonymously within the aviation sector.

Essential Concepts

Airmanship

The consistent use of good judgment and well-developed skills to accomplish flight objectives. This consistency is founded on a cornerstone of uncompromising flight discipline and is developed through systematic skill acquisition and proficiency. A high state of situational awareness completes the airmanship picture and is obtained through knowledge of oneself, aircraft, environment, team and risk.

AOC

An Air Operator Certificate (AOC) is a certificate authorising an operator to carry out specified commercial air transport operations.

Behavioural Marker

A single non-technical skill or competency within a work environment that contributes to effective or ineffective performance.

Bio-mathematical Model

A computer programme designed to predict aspects of a schedule that might generate an increased fatigue risk for the average person, based on scientific understanding of the factors contributing to fatigue. Bio-mathematical models are an optional tool (not a requirement) for predictive fatigue hazard identification within an FRMS. All bio-mathematical models have limitations that need to be understood for their appropriate use.

Change Management

A formal process to manage changes within an organization in a systematic manner, so that changes which may impact identified hazards and risk mitigation strategies are accounted for, before the implementation of such changes.

Complacency

A state of self-satisfaction with one's own performance coupled with an unawareness of danger, trouble, or controversy.

Cross-department Interfaces

The points of interaction and collaboration between different departments within the organization.

Dirty Dozen

The Dirty Dozen refers to twelve of the most common human error preconditions, or conditions that can act as precursors, to accidents or incidents. These twelve elements influence people to make mistakes. The Dirty Dozen is a concept developed by Gordon Dupont, in 1993, whilst he was working for Transport Canada, and formed part of an elementary training programme for Human Performance in Maintenance. Dirty Dozen are Lack of communication, Complacency, Lack of knowledge, Distraction, Lack of teamwork, Fatigue, Lack of resources, Pressure, Lack of assertiveness, Stress, Lack of awareness and Norms.

ETOPs

Extended-range Twin-engine Operational Performance Standards are those operations intended to be, or, conducted over a route that contains a point further than one hour's flying time (in still air) at the normal one-engine-inoperative cruise speed from an adequate aerodrome.
Updated terminology: EDTO, *Extended Diversion Time Operations*.

Fatigue

A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to perform safety-related operational duties.

Fatigue Risk Management System (FRMS)

A data-driven means of continuously monitoring and managing fatigue related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

Fatigue Safety Action Group (FSAG)

A group comprised of representatives of all stakeholder groups (management, scheduling, operational personnel) together with any additional specialist experts (i.e. scientists, data analysts, and medical professionals), that is responsible for coordinating all fatigue management activities in the organization.

Human Factors Analysis and Classification System (HFACS)

The Human Factors Analysis and Classification System (HFACS) was developed by Dr Scott Shappell and Dr Doug Wiegmann. It is a broad human error framework that was originally used by the U.S. Navy to investigate and analyse human factors aspects of aviation. HFACS is heavily based upon James Reason's Swiss cheese model (Reason 1990). The HFACS framework provides a tool to assist in the investigation process and target training and prevention efforts. Investigators can systematically identify active and latent failures within an organisation that culminated in an accident. The goal of HFACS is not to attribute blame; it is to understand the underlying causal factors that lead to an accident.

Human Factors

Human Factors (HF) is concerned with the application of what we know about human beings, their abilities, characteristics and limitations, to the design of equipment they use, environments in which they function and jobs they perform.

Human Factors Integrated Training

A systematic approach that incorporates Human Factors principles, topics and hazards into an organization's training programs. This approach brings together pilots, cabin crew, maintenance staff, ground handling personnel, cargo staff, dispatchers, and other relevant roles in a shared classroom environment. The goal of this training is to optimize the interaction between people, technology, and the work environment, share problems and challenges, identify common risks, foster empathy, and improve safety, performance, and overall system effectiveness.

Human Performance

Human Performance (HP) refers to how people perform their tasks. HP represents the human contribution to system performance.

PEAR

The mnemonic PEAR is used to recall the four considerations for assessing and mitigating human factors in aviation maintenance: People who do the job; Environment in which they work; Actions they perform; and Resources necessary to complete the job.

Performance Evaluation

It is a systematic process used by organizations to assess how well employees are fulfilling their job responsibilities and contributing to the achievement of organizational goals.

Risk Mitigation

The process of incorporating defences, preventive controls or recovery measures to lower the severity and/or likelihood of a hazard's projected consequence.

Safety Performance Indicators

A data-based parameter used for monitoring and assessing safety performance.

SHELL

It is a conceptual tool used to analyse the interaction of multiple system components. The name being derived from the initial letters of its components, Software, Hardware, Environment, Liveware.
Software - the rules, procedures, written documents etc., which are part of the standard operating procedures.
Hardware - the aircraft systems, their configuration, controls and surfaces, displays and functional systems.
Environment - the situation in which the L-H-S system must function, the social and economic climate as well as the natural environment.
Liveware - the human beings - the pilot with the controllers, cabin crews, engineers and maintenance personnel, management and administration people - within in the system.

Situational Awareness

The perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future. Situational awareness involves understanding the current environment, anticipating future states, and making informed decisions based on this understanding.

Safety Management System (SMS)

A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

Taxonomy

Refers to the classification system used to organize and categorize various elements related to aviation operations, safety, and incidents. This structured system helps in standardizing terminology and improving communication across the industry

TEM

The Threat and Error Management (TEM) framework is a conceptual model that assists in understanding, from an operational perspective, the inter-relationship between safety and human performance in dynamic and challenging operational contexts. There are three basic components in the TEM framework: Threats - generally defined as events or errors that occur beyond the influence of the line personnel, increase operational complexity, and which must be managed to maintain the margins of safety. Errors - generally defined as actions or inactions by the line personnel that lead to deviations from organisational or operational intentions or expectations. Unmanaged and/or mis-managed errors frequently lead to undesired states. Errors in the operational context thus tend to reduce the margins of safety and increase the probability of an undesirable event. Undesired states - generally defined as operational conditions where an unintended situation results in a reduction in margins of safety. Undesired states that result from ineffective threat and/or error management may lead to compromised situations and reduce margins of safety aviation operations. Often considered the last stage before an incident or accident.

Wellbeing

Well-being is a positive state experienced by individuals and societies. Similar to health, it is a resource for daily life and is determined by social, economic and environmental conditions.


CARGO FIRE
WINDOW HEAT
FUEL JETTISON
L ENG
R ENG
AIMS-L
LDG GEAR

Strategic Highlights: Survey Sections

Survey Participation

With a total of 72 complete responses, the survey reflects a good level of engagement from the participating airlines. This robust participation ensures that the survey results are comprehensive and representative of the industry's perspectives and practices.

Demographics

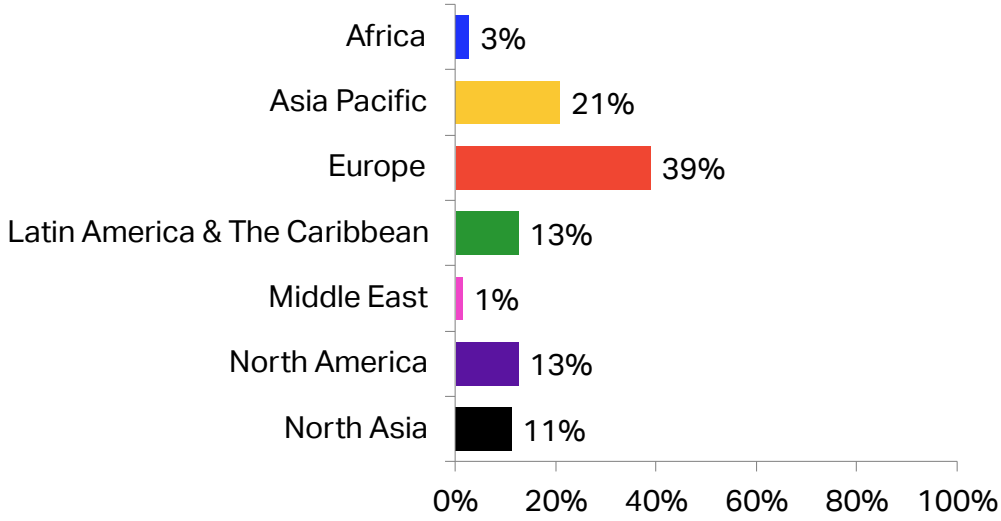
IATA Regions

Most responses to the survey came from Europe, accounting for 38.89% of the total, indicating the highest level of participation from this region. This is followed by Asia Pacific with 20.83%, and both Latin America and North America each contributing 12.50% of the responses. North Asia provided 11.11% of the responses, while Africa and the Middle East had the lowest participation, with 2.78% and 1.39% respectively.

This distribution suggests that European organizations have a higher interest in the survey topic compared to other regions. The significant participation from Asia Pacific also highlights a strong regional interest. The relatively lower response rates from Africa and the Middle East may indicate a need for increased outreach or engagement efforts in these areas to ensure a more balanced representation in future surveys.

Q8: IATA Region

Answered: 72 Skipped: 0



- Europe: 38.89% (28 responses).
- Asia Pacific: 20.83% (15 responses).
- North America: 12.50% (9 responses).
- Latin America & The Caribbean: 12.50% (9 responses).
- North Asia: 11.11% (8 responses).
- Africa: 2.78% (2 responses).
- Middle East: 1.39% (1 response).

Airline Size

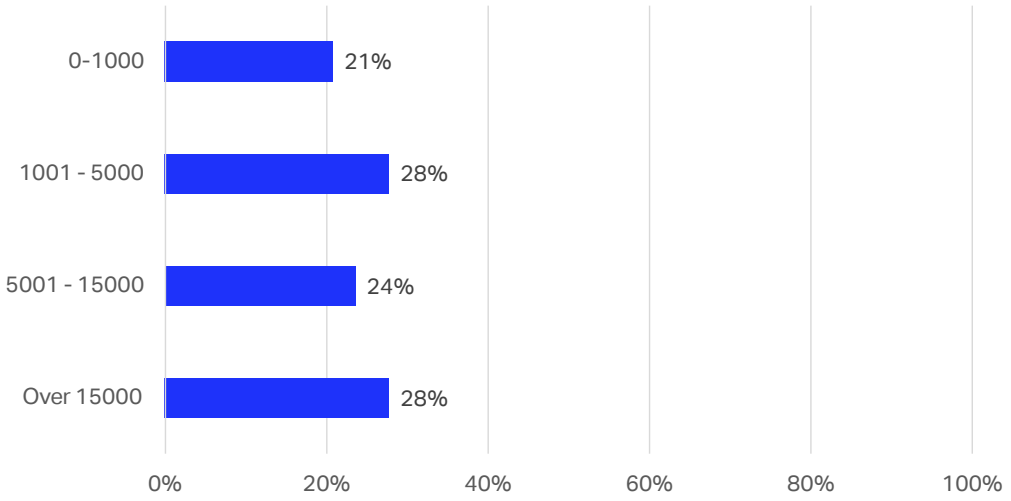
The survey responses varied across airlines with different employee counts, highlighting diverse organizational sizes. Notably, 27.78% of the respondents represented airlines with over 15,000 employees, indicating significant participation from larger organizations. Similarly, airlines with 1001-5000 employees also accounted for 27.78% of the responses, showing substantial engagement from mid-sized organizations.

Airlines with 5001-15000 employees contributed 23.61% of the responses, while those with 0-1000 employees made up 20.83%. This distribution suggests that both large and mid-sized airlines are actively engaged in the survey, with smaller airlines also showing considerable interest.

The varied participation across different employee counts reflects the diverse perspectives and experiences within the industry, providing a comprehensive understanding of the survey topic. This balanced representation ensures that the findings are relevant and applicable to airlines of all sizes.

Q9: How many employees does your airline have?

Answered: 72 Skipped: 0



- 0-1000: 20.83% (15 responses).
- 1001-5000: 27.78% (20 responses).
- 5001-15000: 23.61% (17 responses).
- Over 15000: 27.78% (20 responses).

Aircraft Fleet

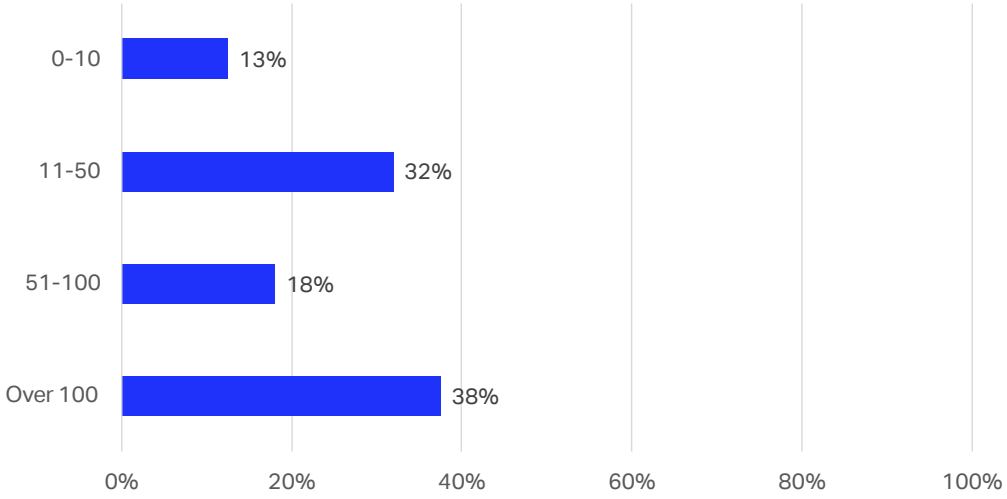
The survey responses indicate that a significant portion of airlines, 37.50%, operate fleets with over 100 aircraft, highlighting substantial participation from larger airlines. This is followed by airlines with 11-50 aircraft, which account for 31.94% of the responses, showing strong engagement from mid-sized fleets.

Airlines with 51-100 aircraft contributed 18.06% of the responses, while those with 0-10 aircraft made up 12.50%. This distribution suggests that both large and mid-sized airlines are actively involved in the survey, with smaller airlines also showing notable interest.

The varied participation across different fleet sizes reflects the diverse operational scales within the industry. This balanced representation ensures that the findings are relevant and applicable to airlines with varying fleet sizes.

Q10: How many aircraft does your airline have?

Answered: 72 Skipped: 0



- 0-10: 12.50% (9 responses).
- 11-50: 31.94% (23 responses).
- 51-100: 18.06% (13 responses).
- Over 100: 37.50% (27 responses).

Network Characteristics

The survey responses reveal that a significant majority of airlines, 83.33%, operate internationally, indicating a strong focus on global operations. Additionally, 69.44% of airlines have domestic operations, while 47.22% operate regionally, showcasing a diverse range of network characteristics.

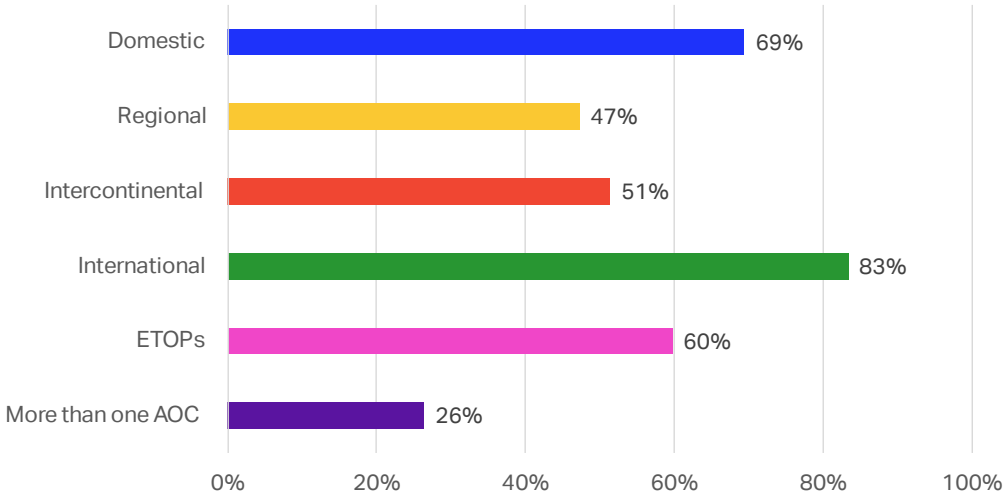
Intercontinental operations are conducted by 51.39% of the airlines, highlighting their capability to manage long-haul flights. Furthermore, 59.72% of airlines are involved in Extended-range Twin-engine Operational Performance Standards (ETOPs) operations, demonstrating their ability to handle extended-range flights.

A notable 26.39% of airlines operate with more than one Air Operator Certificate (AOC), indicating a level of complexity in their operational structure.

Overall, the varied network characteristics reflect the diverse operational capabilities and strategic focuses of the airlines surveyed. This comprehensive representation ensures that the survey findings are relevant and applicable to airlines with different operational scopes and complexities.

Q11: Network Characteristics

Answered: 72 Skipped: 0



- Domestic: 69.44% (50 responses).
- Regional: 47.22% (34 responses).
- Intercontinental: 51.39% (37 responses).
- ETOPs: 59.72% (43 responses).
- More than one AOC: 26.39% (19 responses).

Type of Commercial Operation

The survey responses indicate that the dominant type of commercial operation among the participating airlines is Full Service - Legacy Carrier, with 70.83% of respondents falling into this category. This suggests that traditional, full-service airlines are the most prevalent among the survey participants.

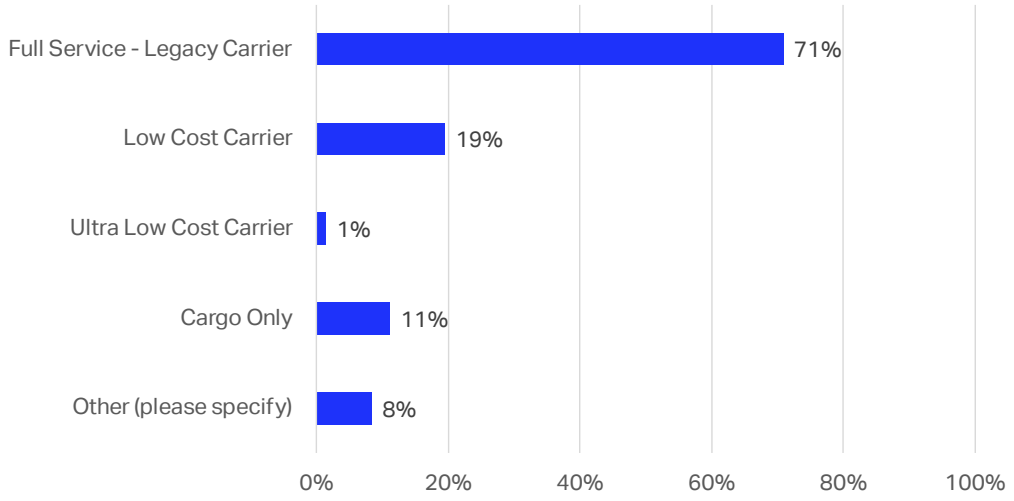
Low-Cost Carriers account for 19.44% of the responses, reflecting a significant presence of budget airlines. Ultra Low-Cost Carriers are minimally represented, with only 1.39% of the responses, indicating a smaller footprint in the survey.

Cargo-only operations make up 11.11% of the responses, highlighting the importance of freight services within the industry. Additionally, 8.33% of respondents fall into the "Other" category, suggesting a variety of specialized or mixed operations.

Overall, the survey results provide a comprehensive overview of the types of commercial operations within the aviation industry, with a strong representation of full-service legacy carriers and notable participation from low-cost and cargo airlines.

Q12: Type of commercial operation

Answered: 72 Skipped: 0



- Full Service - Legacy Carrier: 70.83% (51 responses)
- Low-Cost Carrier: 19.44% (14 responses).
- Ultra Low-Cost Carrier: 1.39% (1 response).
- Cargo Only: 11.11% (8 responses).
- Other: 8.33% (6 responses).

Human Factors (HF) Regulations

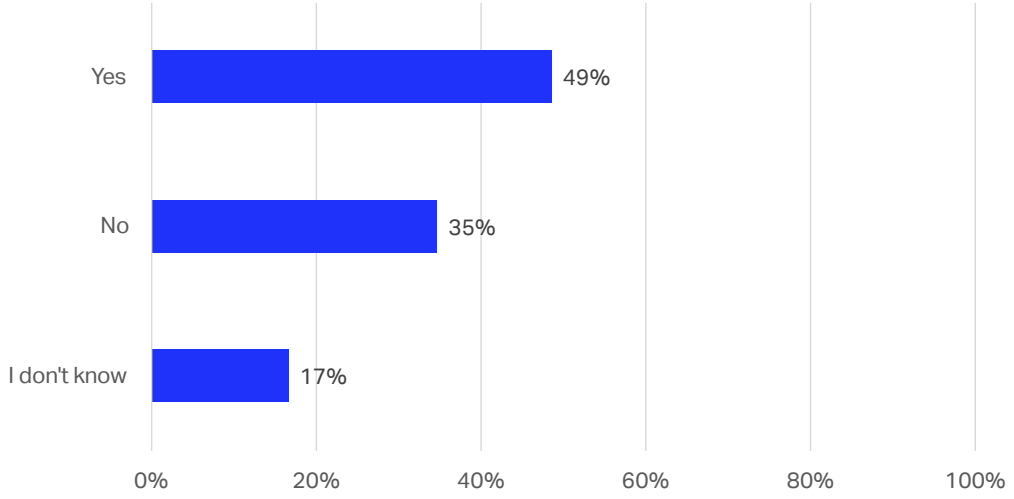
The survey responses indicate that 48.61% of the participants confirmed the existence of Human Factors (HF) regulations by their National Civil Aviation Authority. This suggests that nearly half of the respondents operate in environments where HF regulations are formally established and enforced.

However, 34.72% of respondents reported that their National Civil Aviation Authority does not have published HF regulations, highlighting a significant portion of the industry that may lack formal regulatory guidance on HF. Additionally, 16.67% of respondents were unsure about the existence of such regulations, indicating a need for increased awareness and communication regarding HF regulatory frameworks.

The data reflects a mixed landscape in terms of HF regulatory adoption, with a substantial number of airlines operating under established HF regulations, while others may benefit from enhanced regulatory development and awareness.

Q13: Are there Human Factors regulations published by the National Civil Aviation Authority of your Country?

Answered: 72 Skipped: 0



- Yes: 48.61% (35 responses).
- No: 34.72% (25 responses).
- I don't know: 16.67% (12 responses).

Theoretical Frameworks

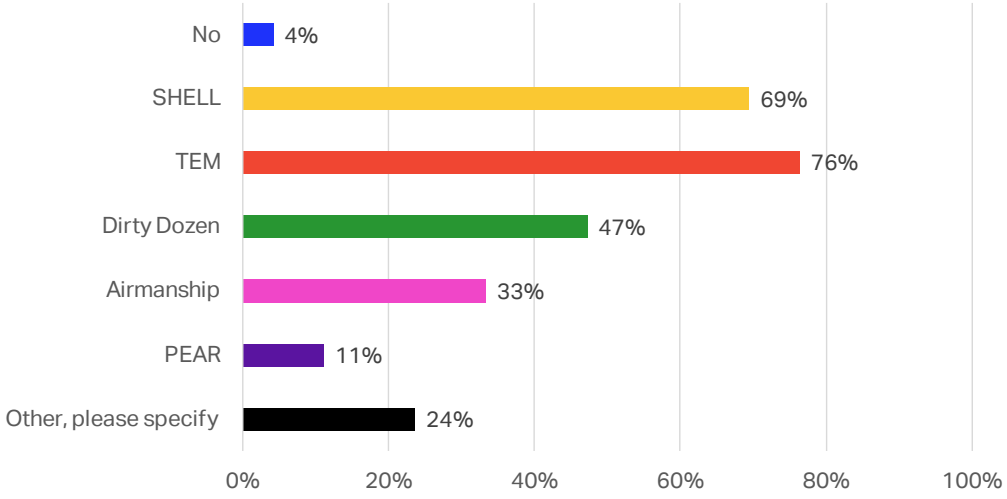
The survey responses indicate that Threat and Error Management (TEM), SHELL, and the Dirty Dozen are the most widely used Human Factors frameworks among the participating airlines. TEM is the most prevalent, with 76.39% of respondents utilizing this framework, followed by SHELL at 69.44%, and the Dirty Dozen at 47.22%.

Airmanship is used by 33.33% of respondents, while PEAR is less common, with only 11.11% adoption. Additionally, 23.61% of respondents reported using other frameworks, indicating a variety of approaches to Human Factors management within the industry. Notably, 4.17% of respondents do not use any formal framework, suggesting an opportunity for increased adoption and standardization.

The data reflects a strong preference for established Human Factors frameworks like TEM, SHELL, and the Dirty Dozen, which are widely recognized for their effectiveness in managing Human Factors in aviation. The varied use of frameworks highlights the diverse strategies employed by airlines to address Human Factors, providing valuable insights into industry practices.

Q14: Do you apply any theoretical framework that guides your work in Human Factors/ Human Performance?

Answered: 72 Skipped: 0



- TEM: 76.39% (55 responses).
- SHELL: 69.44% (50 responses).
- Dirty Dozen: 47.22% (34 responses).
- Airmanship: 33.33% (24 responses).
- PEAR: 11.11% (8 responses).
- Other: 23.61% (17 responses).
- No Framework: 4.17% (3 responses).

Human Factors Programs

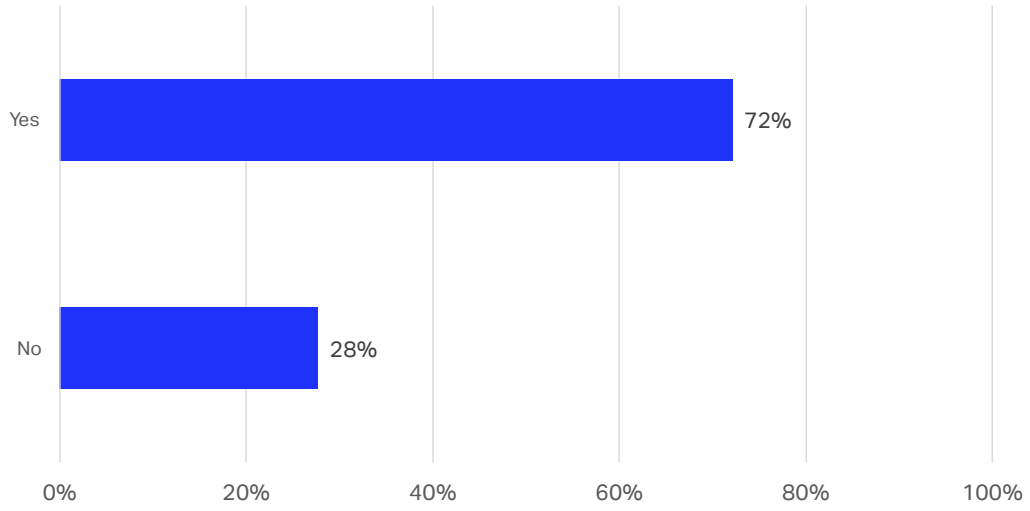
The survey responses indicate that a significant majority of airlines, 72.22%, have Human Factors (HF) and Human Performance (HP) programs in place.

However, 27.78% of respondents reported not having HF/HP programs, highlighting an area for potential improvement. These airlines may benefit from developing and implementing structured HF/HP programs to align with industry best practices and improve their Safety Management Systems.

The high adoption rate of HF/HP programs reflects the industry's recognition of the importance of Human Factors in aviation Safety and performance.

Q15: Do you have a Human Factors (HF) or Human Performance (HP) Program in place?

Answered: 72 Skipped: 0



- Yes: 72.22% (52 responses).
- No: 27.78% (20 responses).

Safety Management Systems (SMS) Integration

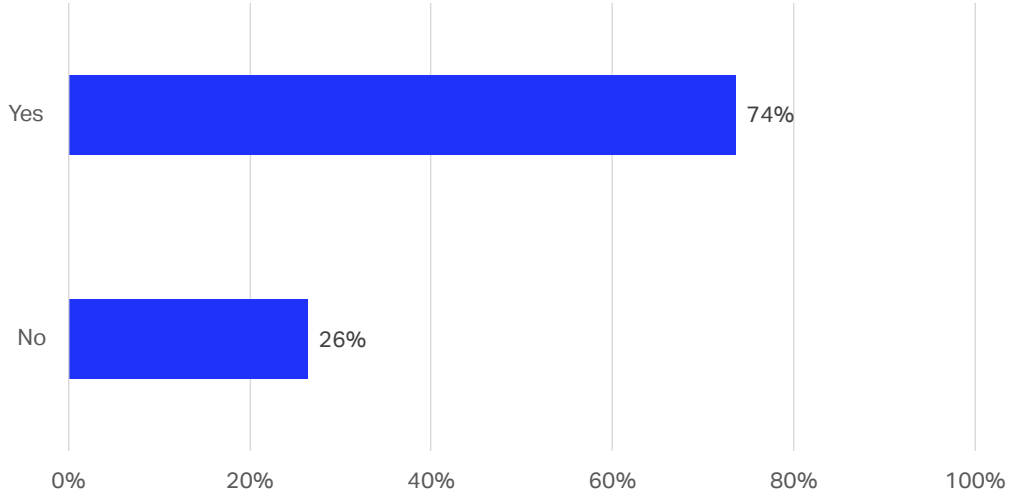
The survey responses indicate that 73.61% of airlines have successfully integrated their Human Factors (HF) and Human Performance (HP) programs into their Safety Management Systems (SMS). This integration reflects a comprehensive approach to Safety management, ensuring that HF considerations are embedded into all Safety processes and procedures.

However, 26.39% of respondents have not yet integrated HF/HP programs into their SMS, highlighting an area for potential improvement. These airlines may benefit from incorporating HF/HP programs into their SMS to enhance their overall Safety management and align with industry best practices.

The high integration rate demonstrates the industry's commitment to a holistic Safety management approach, recognizing the critical role of Human Factors in aviation Safety.

Q16: Is the HF/ HP Program integrated into your airline's SMS?

Answered: 72 Skipped: 0



- Yes: 73.61% (53 responses).
- No: 26.39% (19 responses).

HF/ HP Programs Elements

The survey responses indicate that many airlines include various elements in their Human Factors (HF) and Human Performance (HP) programs, reflecting a comprehensive approach to managing Human Factors. Human Factors training is the most included element, with 77.78% of respondents incorporating it into their programs. This highlights the industry's emphasis on educating employees about HF principles.

Fatigue management is also widely included, with 70.83% of airlines addressing this critical aspect, demonstrating a strong commitment to managing fatigue risks. Incident investigation and occurrence and incident reporting are included by 68.06% and 66.67% of respondents, respectively, indicating robust mechanisms for analysing and reporting Safety incidents.

These elements are primarily carried out by departments such as Flight Operations (FLT), Safety (SAF), Maintenance (MNT), and Training (TRA).

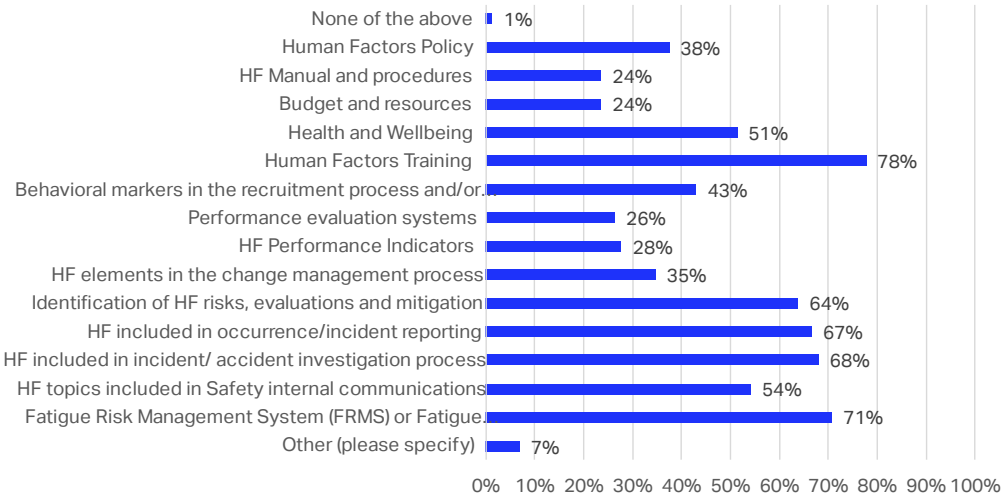
Identification of HF risks is included by 63.89% of airlines, showcasing proactive efforts to recognize and mitigate Human Factors risks. Health and wellbeing are addressed by 51.39% of respondents, reflecting a focus on overall employee wellness.

Other elements such as HF policy, HF manual and procedures, budget and resources, behavioural markers, performance evaluation systems, HF performance indicators, change management process, and Safety internal communications are included to varying degrees, indicating diverse strategies for managing Human Factors.

The inclusion of these elements demonstrates the industry's comprehensive and multifaceted approach to HF/HP management, aiming to enhance Safety, performance, and employee wellbeing.

Q17: Which Human Factors/ Human Performance elements are included in the scope of HF/ HP Program at your airline (Select all applicable):

Answered: 72 Skipped: 0



- Identification of HF risks: 63.89% (46 responses).
- Incident Investigation: 68.06% (49 responses).
- Fatigue Management: 70.83% (51 responses).
- Health and Wellbeing: 51.39% (37 responses).
- Human Factors Policy: 37.50% (27 responses).
- HF Manual and Procedures: 23.61% (17 responses).
- Budget and Resources: 23.61% (17 responses).
- Human Factors Training: 77.78% (56 responses).
- Behavioural Markers: 43.06% (31 responses).
- Performance Evaluation Systems: 26.39% (19 responses).
- HF Performance Indicators: 27.78% (20 responses).
- Change Management Process: 34.72% (25 responses).
- Occurrence/Incident Reporting: 66.67% (48 responses).
- Safety Internal Communications: 54.17% (39 responses).
- Other: 6.94% (5 responses).
- None of the above: 1.39% (1 response).

Cross-department Interfaces

Cross-department interfaces are crucial for ensuring smooth operations, enhancing Safety and efficiency, and improving overall service quality. These interfaces help airlines manage complex operations, improve customer satisfaction, and adapt to changing circumstances more effectively.

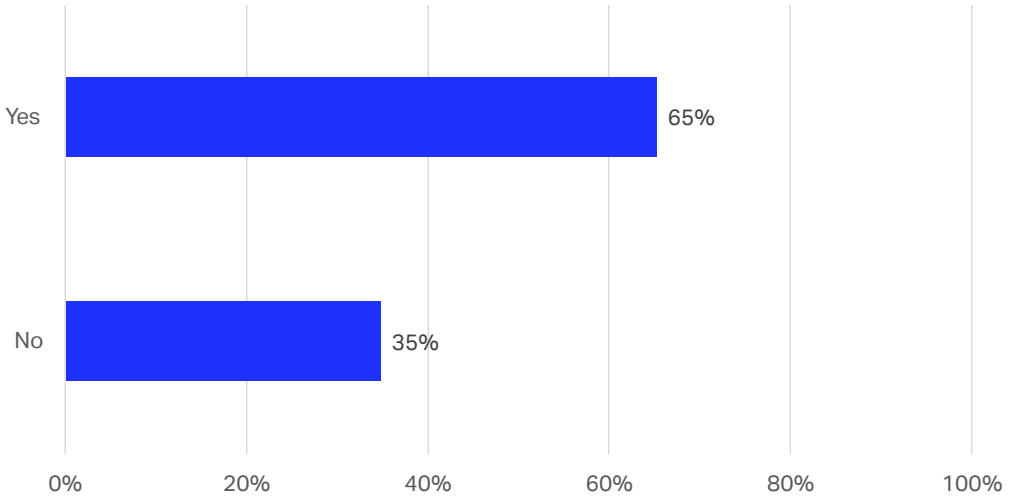
The survey responses indicate that 65.22% of airlines have established cross-department interfaces to manage Human Factors (HF) and Human Performance (HP) across various departments. This demonstrates a strong commitment to fostering collaboration and communication between different areas of the organization, ensuring that HF/HP considerations are integrated into all aspects of operations.

However, 34.78% of respondents have not yet established these interfaces, highlighting an area for potential improvement. These airlines may benefit from creating clear communication channels and interfaces between departments such as Occupational Health and Safety (OHS), Human Resources (HR), Training, Safety, and Flight Operations to enhance their HF/HP management.

The data reflects a significant effort within the industry to promote cross-department collaboration, which is essential for a holistic and effective approach to managing Human Factors.

Q19: Have you established interfaces (i.e. processes, roles, monitoring systems) to manage Human Factors/ Human Performance across various departments within your airline? (e.g. between Occupational Health and Safety (OHS), Human Resources (HR), Rostering, Training, Safety, Flight Operations)

Answered: 69 Skipped: 3



- Yes: 65.22% (45 responses).
- No: 34.78% (24 responses).

Human Factors / Human Performance Policy

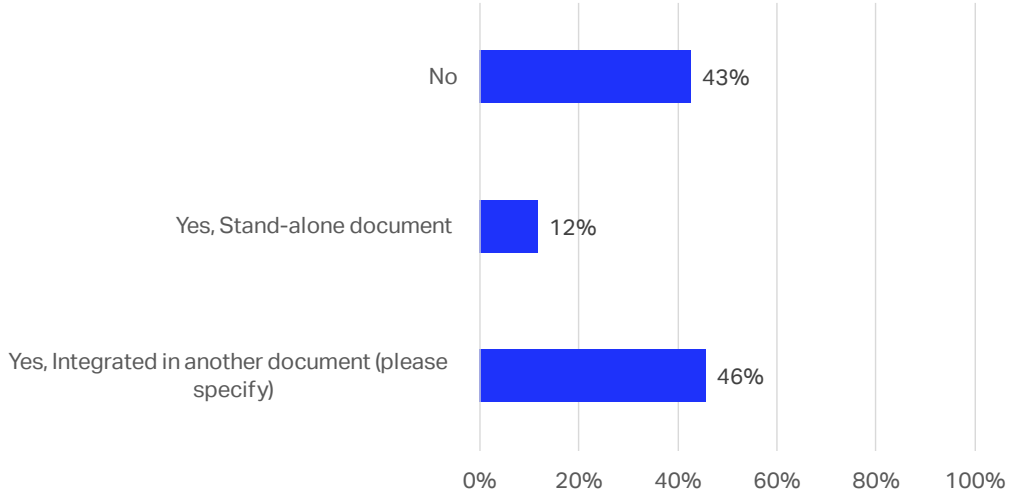
The survey responses indicate that 45.59% of airlines have integrated Human Factors (HF) policies into other documents, reflecting a common approach to embedding HF considerations within broader organizational policies and procedures. This integration helps ensure that HF principles are consistently applied across various aspects of operations.

However, 42.65% of respondents reported not having HF policies, highlighting a significant portion of the industry that may benefit from developing and formalizing HF policies to enhance their Safety management systems. Additionally, 11.76% of airlines have stand-alone HF policy documents, indicating a dedicated focus on Human Factors.

Overall, the data suggests that while many airlines integrate HF policies into other documents, there is still room for improvement in formalizing and standardizing HF policies across the industry. Encouraging the development of both integrated and stand-alone HF policies could further strengthen the industry's commitment to managing Human Factors effectively.

Q20: Do you have a Human Factors (HF) / Human Performance policy in place?

Answered: 68 Skipped: 4



- No: 42.65% (29 responses).
- Stand-alone Document: 11.76% (8 responses).
- Integrated Document: 45.59% (31 responses).

Human Factors Policy and Procedures Scope

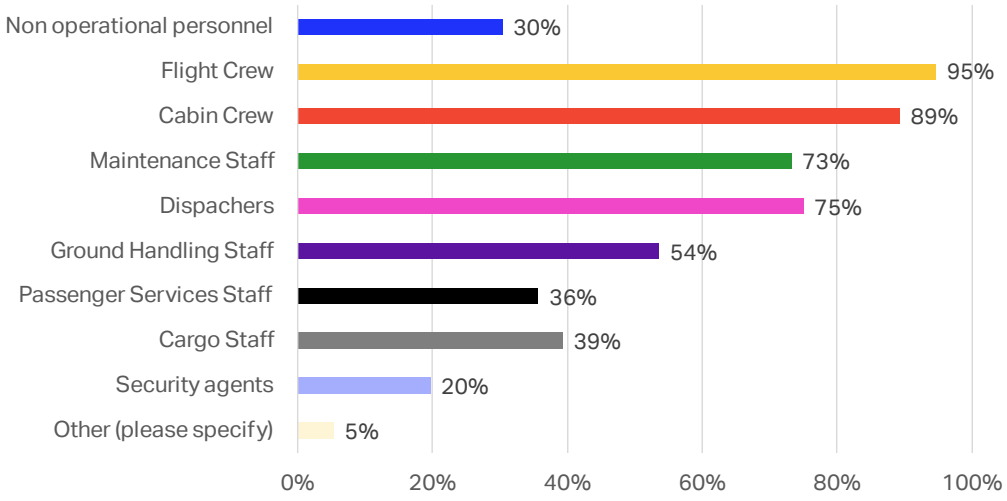
The survey responses indicate that the primary focus of Human Factors (HF) and Human Performance (HP) programs is on flight crew, cabin crew, dispatchers, and maintenance staff. Flight crew are the most emphasized group, with 94.64% of respondents including them in their HF/HP programs, followed closely by cabin crew at 89.29%.

Dispatchers and maintenance staff are also significant focus areas, with 75% and 73.21% of respondents respectively including them in their HF/HP programs. This demonstrates the importance of addressing Human Factors across various operational roles to maintain a high level of Safety and performance.

Ground handling staff, passenger services staff, cargo staff, security agents, and non-operational personnel are included to varying degrees, reflecting a broader approach to managing Human Factors within the organization. The inclusion of these groups indicates a recognition of the diverse roles that contribute to overall Safety and efficiency.

Q21: The scope of your airline's Human Factors/ Human Performance related policy and procedures covers the following roles (Select all applicable):

Answered: 56 Skipped: 16



- Flight Crew: 94.64% (53 responses).
- Cabin Crew: 89.29% (50 responses).
- Maintenance Staff: 73.21% (41 responses).
- Dispatchers: 75.00% (42 responses).
- Ground Handling Staff: 53.57% (30 responses).
- Passenger Services Staff: 35.71% (20 responses).
- Cargo Staff: 39.29% (22 responses).
- Security Agents: 19.64% (11 responses).
- Non-operational Personnel: 30.36% (17 responses).
- Other: 5.36% (3 responses).

Human Factors Manual

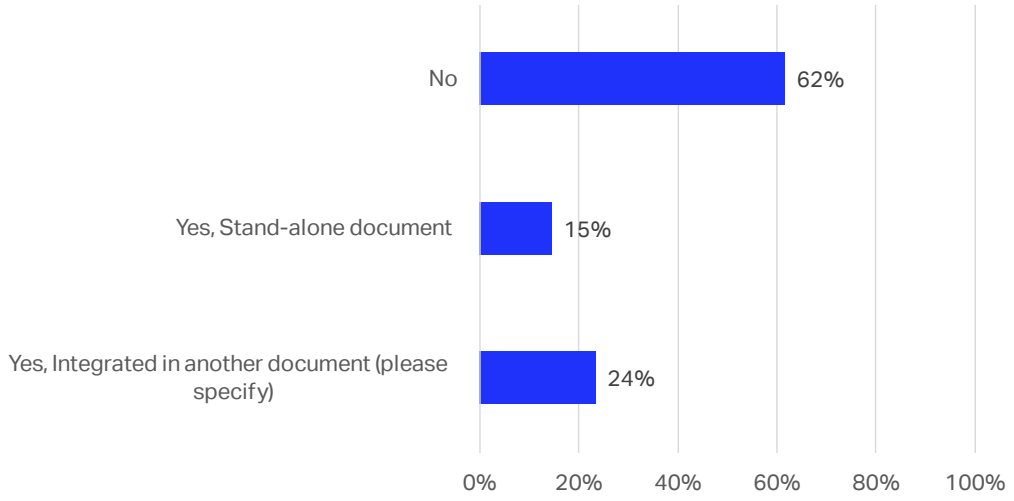
The survey responses indicate that 61.76% of airlines do not have a Human Factors (HF) Manual in place. This suggests that a significant portion of the industry may lack formal documentation outlining their approach to managing Human Factors, potentially impacting the consistency and effectiveness of HF practices.

However, 14.71% of respondents have a stand-alone HF Manual, demonstrating a dedicated focus on Human Factors. Additionally, 23.53% of airlines have integrated HF manuals into other documents, reflecting an effort to embed HF considerations within broader organizational policies and procedures.

The data highlights the need for increased adoption and formalization of HF manuals across the industry.

Q22: Do you have a Human Factors (HF) Manual in place?

Answered: 68 Skipped: 4



- No: 61.76% (42 responses).
- Yes, Stand-alone document: 14.71% (10 responses).
- Yes, Integrated in another document; 23.53% (16 responses).

Recruitment

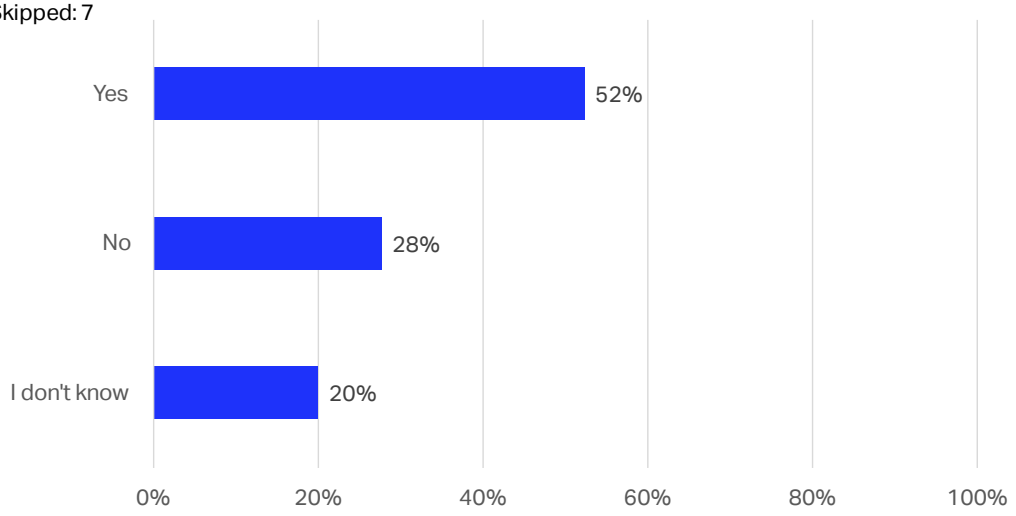
The survey responses indicate that 52.31% of airlines have established Human Factors (HF) and Human Performance (HP) criteria for the selection of licensed personnel, such as flight crew, cabin crew, dispatchers, and maintenance personnel. This demonstrates that personnel are evaluated based on their ability to manage non-technical skills effectively.

However, 27.69% of respondents reported not having established HF/HP criteria, highlighting an area for potential improvement. These airlines may benefit from developing and implementing HF/HP criteria to enhance their selection processes and align with industry best practices.

Additionally, 20% of respondents were unsure about the existence of such criteria, indicating a need for increased awareness and communication regarding HF/HP selection standards.

Q23: Has your airline established Human Factors / Human Performance criteria for the selection of licensed personnel, such as flight crew, cabin crew, dispatchers, and maintenance personnel?

Answered: 65 Skipped: 7



- Yes: 52.31% (34 responses).
- No: 27.69% (18 responses).
- I don't know: 20.00% (13 responses).

Performance Evaluation

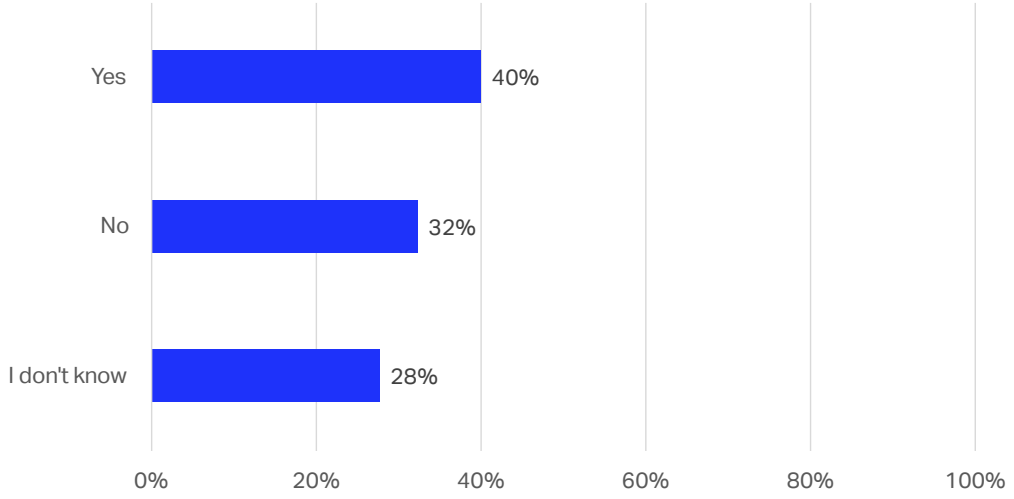
The survey responses indicate that 40% of airlines include aspects related to Safety and Human Factors (HF) in their Human Resources (HR) performance evaluation systems. This demonstrates a significant commitment within the industry to integrate HF considerations into employee evaluations, ensuring that Safety and Human Factors are prioritized in performance assessments.

However, 32.31% of respondents reported not including these aspects in their HR performance evaluation systems, highlighting an area for potential improvement. These airlines may benefit from incorporating HF elements into their evaluation processes to enhance their overall Safety culture and align with industry best practices.

Additionally, 27.69% of respondents were unsure about the inclusion of HF aspects, indicating a need for increased awareness and communication regarding the integration of HF into HR evaluations.

Q24: Do the Human Resources performance evaluation systems include aspects related to Safety & Human Factors?

Answered: 65 Skipped: 7



- Yes: 40 % (26 responses).
- No: 32.31% (21 responses).
- I don't know: 27.69% (18 responses).

Behavioural Markers

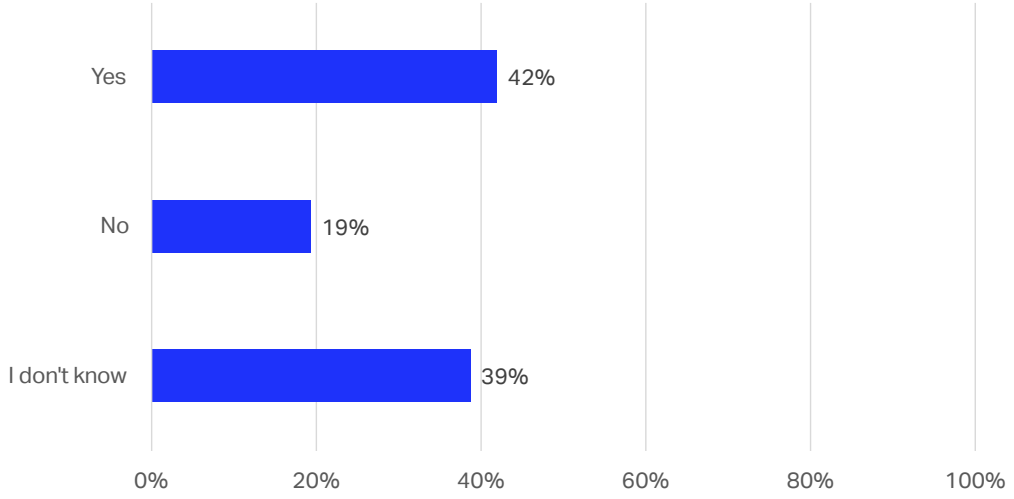
The survey responses indicate that 41.94% of airlines have aligned Human Resources (HR) aspects with behavioural markers assessed in technical trainings. This demonstrates a significant commitment within the industry to ensure that HR performance evaluations are consistent with the behavioural standards set during technical training, promoting a cohesive approach to managing Human Factors.

However, 19.35% of respondents reported not aligning these aspects, highlighting an area for potential improvement. Additionally, 38.71% of respondents were unsure about the alignment, indicating a need for increased awareness and communication regarding the integration of HR aspects with technical training assessments.

The data reflects a mixed landscape in terms of alignment between HR performance evaluations and technical training behavioural markers.

Q25: Are these Human Resources aspects aligned with behavioural markers assessed in technical trainings?

Answered: 62 Skipped: 10



- Yes: 41.94% (26 responses).
- No: 19.35% (12 responses)
- I don't know: 38.71% (24 responses)

Human Factors/ Human Performance Training

The survey responses indicate that Human Factors (HF) and Human Performance (HP) training is widely implemented across various employee roles within airlines. Flight crew are the most trained group, with 89.23% of respondents including them in their HF/HP training programs.

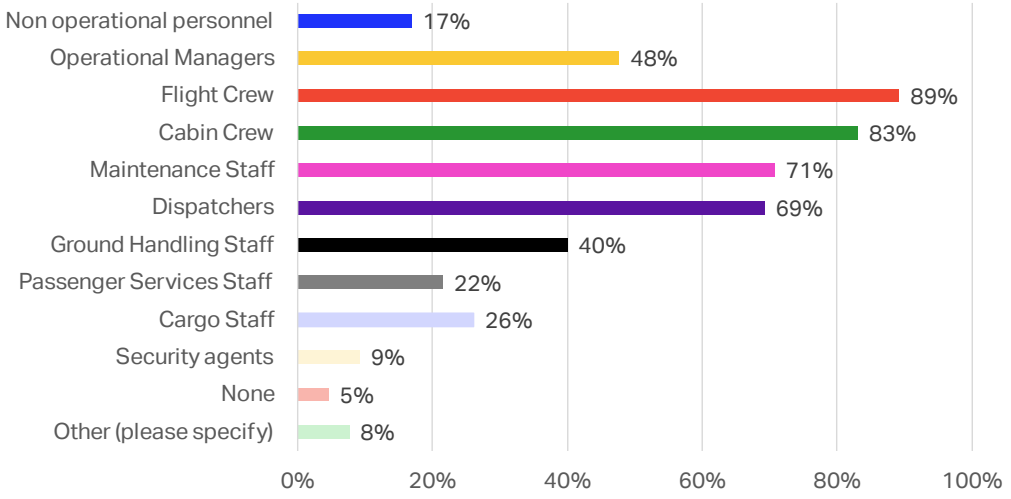
Cabin crew also receive substantial training, with 83.08% of respondents including them in their programs. Maintenance staff and dispatchers are trained by 70.77% and 69.23% of airlines respectively, demonstrating a strong commitment to addressing HF across key operational roles.

Operational managers are included in HF/HP training by 47.69% of respondents, reflecting the importance of managerial oversight in HF practices. Ground handling staff, passenger services staff, cargo staff, and security agents are trained to varying degrees, indicating a broader approach to HF/HP training within the organization.

The data suggests that airlines prioritize HF/HP training for flight crew, cabin crew, maintenance staff, and dispatchers.

Q26: Please select all applicable employees' roles for which the Human Factors/ Human Performance training have been implemented:

Answered: 65 Skipped: 7



- Non-operational personnel: 16.92% (11 responses).
- Operational Managers: 47.69% (31 responses).
- Flight Crew: 89.23% (58 responses).
- Cabin Crew: 83.08% (54 responses).
- Maintenance Staff: 70.77% (46 responses).
- Dispatchers: 69.23% (45 responses).
- Ground Handling Staff: 40.00% (26 responses).
- Passenger Services Staff: 21.54% (14 responses).
- Cargo Staff: 26.15% (17 responses).
- Security agents: 9.23% (6 responses).
- None: 4.62% (3 responses).
- Other (please specify): 7.69% (5 responses).

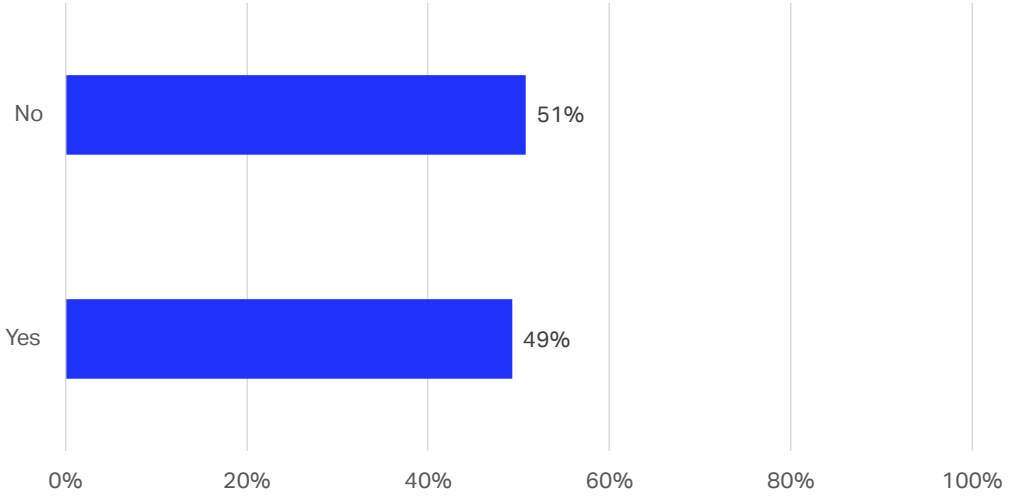
HF/ HP Integrated Training

The survey responses indicate that the integration of Human Factors (HF) and Human Performance (HP) training between operational areas is nearly evenly split among airlines. Specifically, 49.23% of respondents have integrated HF/HP training across different operational areas, demonstrating a commitment to a cohesive and comprehensive approach to HF/HP management.

However, 50.77% of respondents reported not having integrated HF/HP training between operational areas, highlighting an area for potential improvement. These airlines may benefit from aligning their HF/HP training programs across various departments to ensure consistency and enhance overall Safety and performance.

Q27: Is the Human Factors/ Human Performance training integrated between operational areas?

Answered: 65 Skipped: 7



- No: 50.77% (33 responses).
- Yes: 49.23% (32 responses).

Fatigue Management Training

The survey responses indicate that fatigue management training is widely implemented across various employee roles within airlines. Flight crew are the most trained group, with 92.31% of respondents including them in their fatigue management training programs.

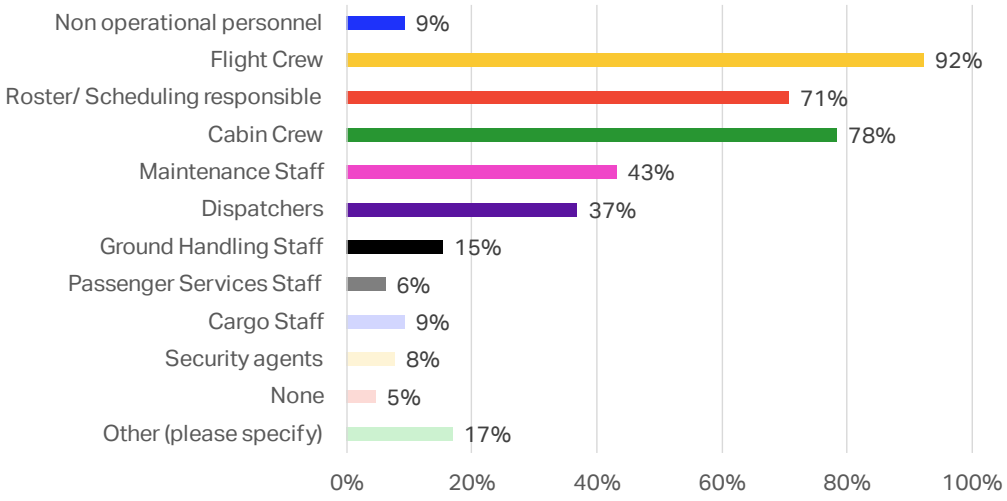
Roster/scheduling personnel and cabin crew also receive substantial training, with 70.77% and 78.46% of respondents respectively including them in their programs.

Maintenance staff and dispatchers are trained by 43.08% and 36.92% of airlines respectively. Ground handling staff, passenger services staff, cargo staff, and security agents are trained to varying degrees, indicating a broader approach to fatigue management within the organization.

The data suggests that airlines prioritize fatigue management training for flight crew, roster/scheduling personnel, and cabin crew.

Q28: Please select all applicable employees' roles that are trained on Fatigue Management:

Answered: 65 Skipped: 7



- Non-operational personnel: 9.23% (6 responses).
- Flight Crew: 92.31% (60 responses).
- Roster/ Scheduling responsible: 70.77% (46 responses).
- Cabin Crew: 78.46% (51 responses).
- Maintenance Staff: 43.08% (28 responses).
- Dispatchers: 36.92% (24 responses).
- Ground Handling Staff: 15.38% (10 responses).
- Passenger Services Staff: 6.15% (4 responses).
- Cargo Staff: 9.23% (6 responses).
- Security agents: 7.69% (5 responses).
- None: 4.62% (3 responses).
- Other (please specify): 16.92% (11 responses).

IATA Human Factors and Fatigue Management Trainings

Among the extensive range of IATA training courses, there are two that specifically address Human Factors and Fatigue Management topics. The training courses listed below have been recently updated to incorporate the latest knowledge and practical approaches for airlines.

For more information about IATA Trainings, please visit us at: I IATA - Training

Human Factors in Aviation

This course covers the principles of Human Factors and provides the necessary knowledge to foster and promote a positive safety culture within an organization. Topics include the four core disciplines of Human Factors, key models used to explain them, the influence of culture, and the role of human error.

Fatigue Risk Management System (FRMS)

Actions to reduce fatigue-related accidents remain a critical item requiring attention. So, the Fatigue Risk Management System approach represents an opportunity for operators to use scientific knowledge to manage fatigue risk with the possibility of increasing operational flexibility. The FRMS training emphasizes the safety

benefits of implementing an FRMS, such as increased crew member alertness, better work-life balance amongst crews, and a reduction in absenteeism attributed to fatigue. In addition to this, an FRMS may facilitate increased productivity and rostering flexibility.

Human Factors and Risk Assessments

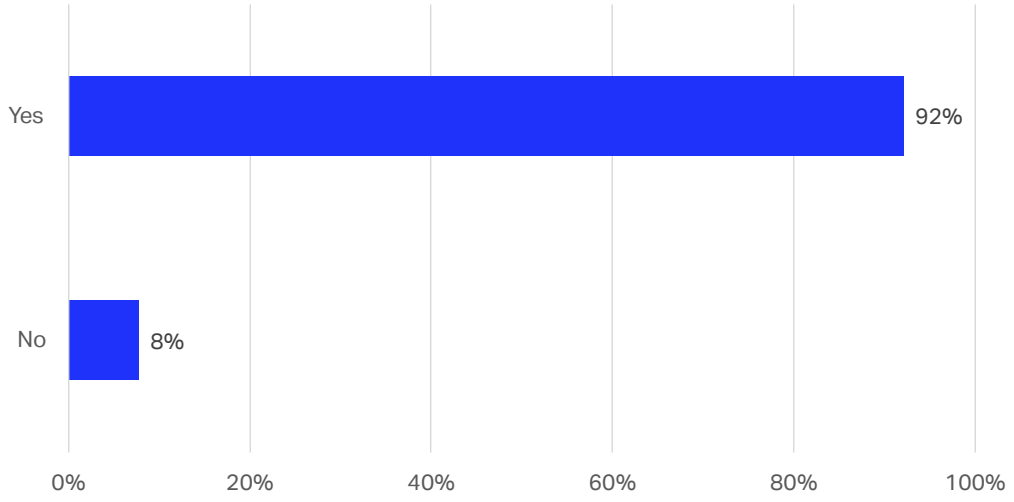
The survey responses indicate that a significant majority of airlines, 92.19%, consider Human Factors (HF) when conducting risk assessment and mitigation activities. This demonstrates a strong commitment within the industry to integrate HF considerations into Safety management processes, ensuring that Human Factors are systematically addressed to enhance overall Safety and operational performance.

However, 7.81% of respondents reported not considering HF in their risk assessment and mitigation activities, highlighting an area for potential improvement. These airlines may benefit from incorporating HF elements into their risk management processes to align with industry best practices and improve their Safety outcomes.

Overall, the high adoption rate of HF considerations in risk assessment and mitigation activities reflects the industry's recognition of the importance of Human Factors in aviation Safety.

Q29: Do you consider Human Factors when conducting risk assessment and mitigations activities?

Answered: 64 Skipped: 8



- Yes: 92.19% (59 responses).
- No: 7.81% (5 responses).

Human Factors/Human Performance Risks

Q30 Please share the top 3 Human Factors/ Human Performance risks that you identified in your airline

- **Fatigue**
  Fatigue was the most frequently mentioned risk, highlighting its critical impact on Safety and performance. Long working hours, night shifts, and high workload contribute significantly to fatigue. Fatigue can lead to reduced alertness, slower reaction times, and increased likelihood of errors.

- **Stress**
  Stress was another commonly identified risk, affecting various roles within airlines. Operational pressures, high workload, and personal issues contribute to stress. Stress can impair decision-making, reduce situational awareness, and negatively impact overall well-being.

- **Communication Issues**
  Communication problems were frequently cited as a significant risk. Miscommunication, lack of clear instructions, and language barriers can lead to misunderstandings. Poor communication can result in errors, reduced teamwork, and compromised Safety.

- **Workload Management**
  High workload and inadequate workload management were highlighted as critical risks. Insufficient staffing, complex tasks, and time pressure contribute to high workload. Overburdened staff may experience burnout, reduced performance, and increased error rates.

- **Situational Awareness**
  Loss of situational awareness was identified as a key risk. Distractions, fatigue, and high workload can impair situational awareness. Reduced situational awareness can lead to missed cues, poor decision-making, and Safety incidents.

- **Complacency**
  Complacency was noted as a risk, particularly in routine operations. Familiarity with tasks, overconfidence, and lack of recent incidents can lead to complacency. Complacency can result in overlooked procedures, missed warnings, and increased risk of incidents.

Mitigation Strategies for HF/HP Risks

Q31 Which mitigation strategies (technology, training, procedures) do you apply to your top 3 Human Factors/ Human Performance risks? (Please elaborate)

Training and Education:

- Many airlines emphasize training programs such as CRM (Crew Resource Management), MRM (Maintenance Resource Management), and DRM (Dispatch Resource Management) to address issues like fatigue, stress, and workload.
- Awareness campaigns and training materials are used to educate staff on recognizing and mitigating Human Factors risks.

Procedures and Policies:

- Implementation of standard operating procedures (SOPs) and manuals to ensure consistency and reduce errors.
- Fatigue Risk Management Systems (FRMS) and Fatigue Risk Management Programs (FRMP) are integrated into operations to monitor and manage fatigue.

Technology and Tools:

- Use of biomathematical models and fatigue monitoring tools to predict and mitigate fatigue.
- Automation and digital tools (e.g., electronic TechLog) to streamline processes and reduce workload.

Communication and Reporting:

- Encouraging open communication and reporting systems for fatigue, stress, and other Human Factors issues.
- Peer support programs and psychological support to address mental health and well-being.

Safety and Risk Management:

- Safety promotion through bulletins, briefings, and Safety communications to raise awareness of Human Factors risks.
- Risk assessments and mitigation strategies to proactively address potential issues.

Overall, airlines are adopting a multi-faceted approach combining training, technology, procedures, and communication to effectively manage Human Factors and enhance Safety and performance.

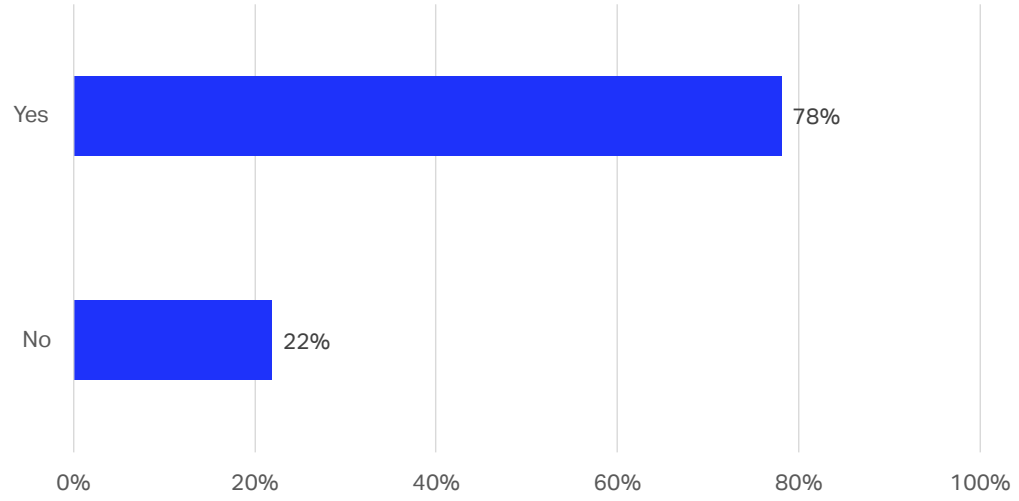
Occurrence and Incident Reporting

The survey responses indicate that a significant majority of airlines, 78.13%, have implemented Human Factors (HF) considerations in their occurrence and incident reporting processes.

However, 21.88% of respondents reported not including HF in their occurrence and incident reporting, highlighting an area for potential improvement. These airlines may benefit from incorporating HF elements into their reporting processes to align with industry best practices and improve their Safety outcomes.

Q32: Have you implemented Human Factors/ Human Performance in occurrence/incident reporting?

Answered: 64 Skipped: 8



- Yes: 78.13% (50 responses).
- No: 21.88% (14 responses).

Human Factors Taxonomy

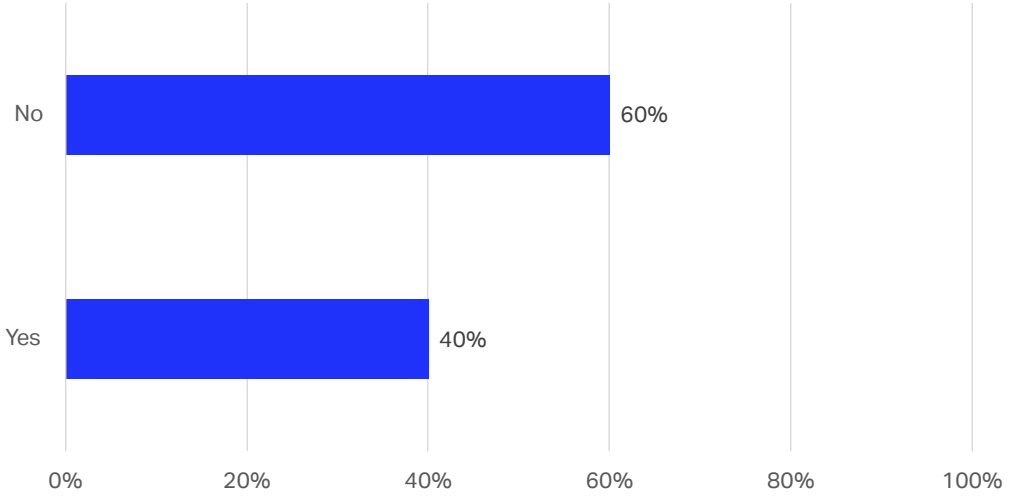
The presence of a formal Human Factors (HF) taxonomy used throughout the organization indicates a structured and standardized approach to managing Human Factors. Having a formal HF taxonomy enhances the organization's ability to address Human Factors systematically and effectively.

Based on the survey responses, 40% of airlines reported having a formal Human Factors taxonomy used throughout their organization. This indicates a substantial commitment within the industry to systematically classify and analyse Human Factors in Safety management.

However, 60% of respondents indicated that they do not have a formal Human Factors taxonomy, highlighting a big area for potential improvement.

Q33: Do you have a formal Human Factors taxonomy that is used throughout your organisation?

Answered: 60 Skipped: 12



- No: 60.00% (36 responses)
- Yes: 40.00% (24 responses)

Report of HF Aspects that Affect Job Performance

Q34 How do Staff report aspects of Human Factors that affect job performance (e.g., fatigue, stress, illness, etc.) Please elaborate

The survey responses indicate that airlines have established various methods for staff to report Human Factors that affect job performance, such as fatigue, stress, and illness. The reporting mechanisms include:

- **Safety Reporting Systems:** Many airlines use Safety reporting systems where staff can submit reports on fatigue, stress, and other Human Factors. These systems are often accessible through company devices or apps, ensuring ease of use and confidentiality.
- **Fatigue Reporting Forms:** Specific forms dedicated to reporting fatigue are commonly used. These forms allow staff to detail instances of fatigue and its impact on their performance.
- **Voluntary and Confidential Reporting**: Several airlines have voluntary and confidential reporting systems in place. These systems encourage staff to report any issues without fear of repercussions, promoting a culture of Safety and openness.
- **Direct Reporting to Medical Examiners:** In some cases, staff can report directly to aviation medical examiners, especially for issues related to health and fitness for duty.
- **Peer Support Programs**: Some airlines have peer support programs where staff can discuss their concerns with trained peers, providing an additional layer of support.

Overall, the responses highlight a strong emphasis on creating accessible, confidential, and supportive reporting mechanisms to address Human Factors affecting job performance. This approach helps in identifying and mitigating risks, thereby enhancing overall Safety and well-being within the airline industry.

Investigation process: Classification and Analysis

Airlines employ a variety of methodologies and frameworks for investigating Human Factors (HF) and Human Performance (HP) aspects.

Based on the survey responses, 17.19% of airlines reported using the Cause Tree Method for the classification and analysis of Human Factors aspects, while 12.50% use the Fault and Error Tree Method. 60.94% of airlines utilize Flight Data Analysis (FDR) and Cockpit Voice (CVR) Analysis, and 51.56% employ the Human Factors Analysis and Classification System (HFACS). Additionally, 54.69% of airlines use the Bow Tie method.

The most used methods include:

- Human Factors Analysis and Classification System (HFACS): This is widely adopted for classifying and analysing HF/HP aspects.
- Flight Data Analysis (FDR) and Cockpit Voice Recorder (CVR) Analysis: Utilized to gather and analyse data from flight operations.
- Bow Tie: Applied to visualize and manage risks, including HF/HP aspects.
- Cause Tree Method: Used to trace the root causes of incidents.
- Fault and Error Tree Method: Employed to identify and analyse errors and faults.

Other methodologies mentioned include:

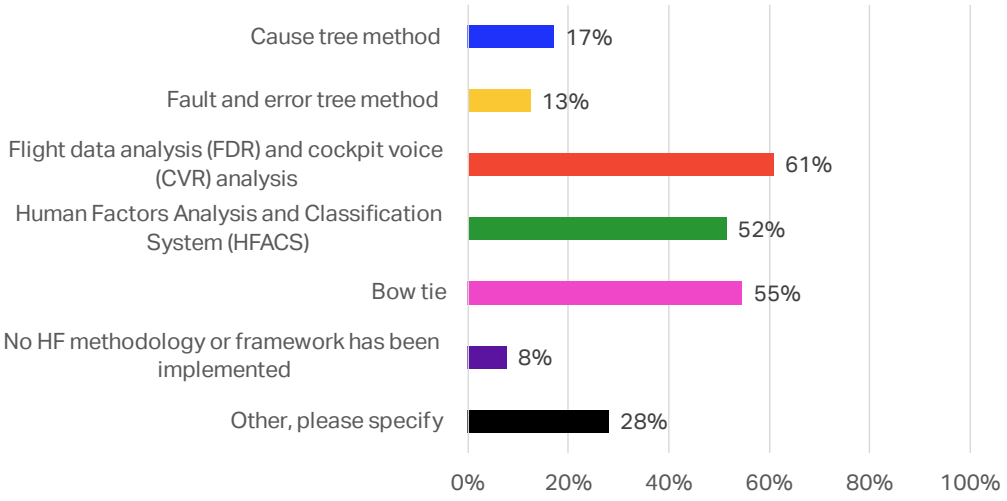
- MEDA (Maintenance Error Decision Aid)
- Operational Learning Review and Adaptive Safety Analysis
- Fishbone, 5 Why, 5M
- TEM (Threat and Error Management)
- Root Cause Analysis (RCA)

These methodologies help airlines systematically investigate and address HF/HP issues, contributing to improved Safety and performance.

This diversity in methodologies indicates a substantial commitment within the industry to systematically classify and analyse Human Factors in Safety management. However, 7.81% of respondents indicated that they do not have any HF methodology or framework implemented, highlighting an area for potential improvement.

Q35: Which methodology/ framework do you use in the investigation process for the classification and analysis of Human Factors/ Human Performance aspects?

Answered: 64 Skipped: 8



- Cause tree method: 17.19% (11 responses).
- Fault and error tree method: 12.50% (8 responses).
- Flight data analysis (FDR) and cockpit voice (CVR) analysis: 60.94% (39 responses).
- Human Factors Analysis and Classification System (HFACS): 51.56% (33 responses).
- Bow tie: 54.69% (35 responses).
- No HF methodology or framework has been implemented: 7.81% (5 responses).
- Other, please specify: 28.13% (18 responses).

Investigation Process: HF/ HP Aspects Considered

Q36 Which Human Factors/ Human Performance aspects do you consider in the investigation process? (e.g. fatigue, stress, psychoactive substances, workload) Please specify.

The responses highlight the diverse range of Human Factors (HF) and Human Performance (HP) aspects considered during the investigation process across various airlines. These aspects include:

- **Fatigue:** Recognized as a critical factor affecting performance, fatigue is consistently monitored and assessed. Many airlines have implemented fatigue management systems to mitigate its impact. This is the most frequently mentioned aspect, with 69.23% of respondents indicating its consideration.

- **Stress:** Stress is another significant factor, often linked to operational pressures and workload. Airlines are increasingly aware of its effects on performance and Safety. 57.69% of respondents include stress in their investigations.

- **Workload:** The balance between workload and performance is crucial. High workload can lead to errors and decreased situational awareness. 53.85% of respondents consider workload as a significant factor.

- **Psychoactive Substances:** Regular testing for psychoactive substances ensures that personnel are fit for duty and not impaired. 38.46% of respondents consider the use of psychoactive substances.

- **Communication:** Effective communication is vital for Safety. Miscommunication can lead to errors and incidents. 30.77% of respondents look at communication issues.
- **Leadership/Supervision:** The role of leadership and supervision in maintaining Safety standards and managing HF/HP aspects is emphasized. 23.08% of respondents consider leadership and supervision.
- **Organizational Factors:** The overall culture within an organization influences how HF/HP aspects are managed and prioritized. 19.23% of respondents include organizational factors in their investigations.
- **Individual Factors:** 15.38% of respondents consider individual factors such as personal health and wellbeing.
- **Environmental Conditions:** 11.54% of respondents consider environmental conditions.
- **Decision Making:** The ability to make informed decisions under pressure is a key aspect of HF/HP. 7.69% of respondents consider decision-making processes.

The inclusion of these factors helps in creating a comprehensive approach to incident investigation, ensuring that all potential influences on human performance are thoroughly examined. Airlines are adopting a comprehensive approach to HF/HP, considering multiple factors that affect performance.

Safety Culture Surveys

A significant majority of respondents, 80.95%, indicated that their organizations conduct Safety Culture Surveys. A smaller portion, 19.05%, reported that their organizations do not conduct these surveys.

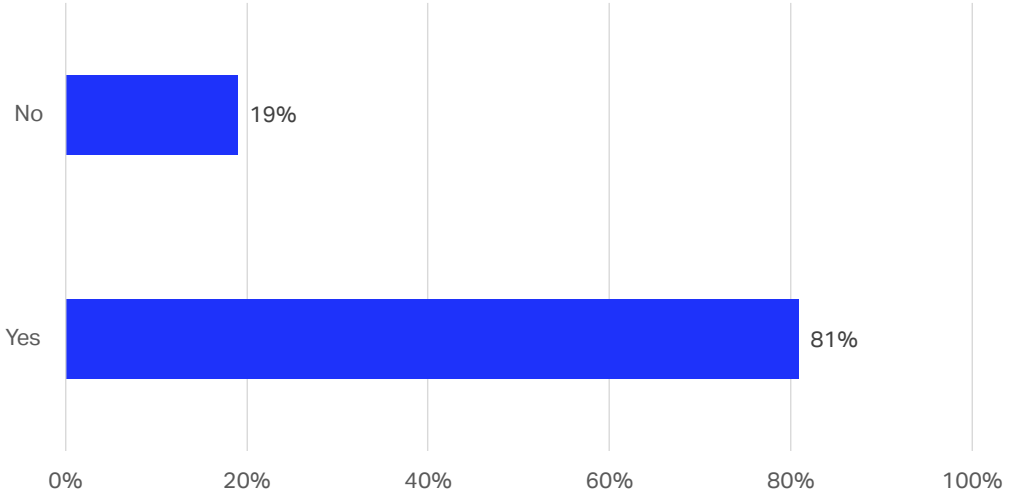
The surveys are conducted at varying frequencies:

- Annually: Many organizations conduct these surveys once a year.
- Bi-annually: Some organizations conduct them every two years.
- Quarterly: A few organizations conduct surveys every three months.
- Irregularly: Some organizations do not have a set frequency and conduct surveys as needed.

The high percentage of organizations conducting Safety Culture Surveys highlights the importance placed on understanding and improving Safety culture within the aviation industry. Regular surveys help in identifying areas for improvement and ensuring that a positive Safety culture is maintained.

Q37: Does your organization conduct Safety Culture Surveys?

Answered: 63 Skipped: 9



- Yes: 80.95% (51 responses).
- No: 19.05% (12 responses).

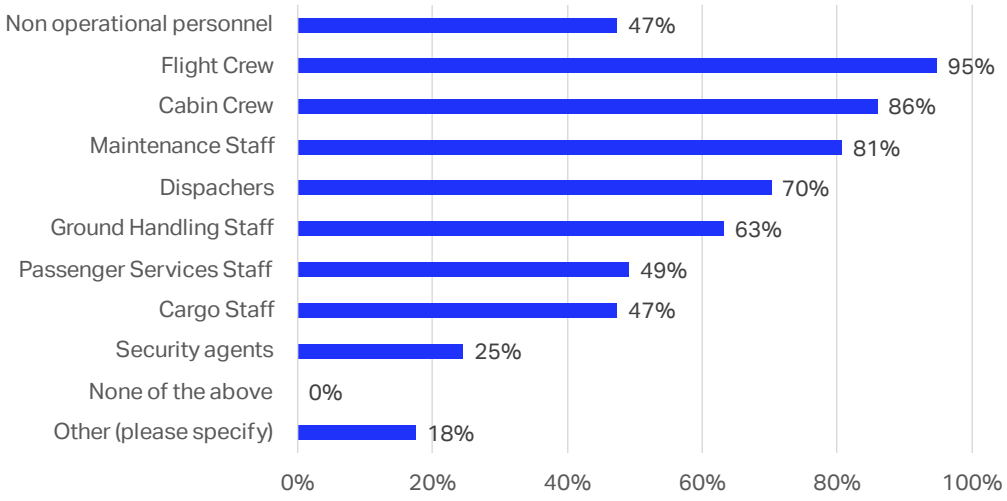
Target Audience for Safety Culture Surveys

The survey results indicate that Safety culture surveys are widely targeted across various roles within airlines. A significant majority of airlines, 94.74%, include Flight Crew in their Safety culture surveys.

Most airlines focus their Safety culture surveys on operational roles such as flight crew, cabin crew (85.96%), and maintenance staff (80.70%), ensuring that the feedback and insights from these critical areas are captured to enhance Safety and performance. Additionally, there is a significant inclusion of ground handling (63.16%) and passenger services staff (49.12%), reflecting a comprehensive approach to Safety culture across the organization.

Q38: If a safety culture survey is conducted in your organization, who is it targeted at?

Answered: 57 Skipped: 15



The percentages of respondents who indicated each role as a target are as follows:

- Flight Crew: 94.74% (54 responses).
- Cabin Crew: 85.96% (49 responses).
- Maintenance Staff: 80.70% (46 responses).
- Dispatchers: 70.18% (40 responses).
- Ground Handling Staff: 63.16% (36 responses).
- Passenger Services Staff: 49.12% (28 responses).
- Cargo Staff: 47.37% (27 responses).
- Non-operational Personnel: 47.37% (27 responses).
- Security Agents: 24.56% (14 responses).
- Other: 17.54% (10 responses).
- None of the above: 0.00% (0 responses).

I-ASC: IATA Aviation Safety Culture Survey

The IATA Aviation Safety Culture survey (I-ASC) was developed in 2016 by IATA in collaboration with Cranfield University and Ipsos. I-ASC helps aviation organizations assess their safety culture, identifying gaps, implement changes, and track progress. Using a standardized methodology and performance indicators, I-ASC delivers measurable, actionable, and comparable results, based on both quantitative and qualitative data, enabling internal and industry benchmarking.

In 2024, IATA enhanced I-ASC to be fully customizable, allowing organizations of all types and sizes to tailor it to their specific needs and budget.

Discover how the I-ASC Survey can help your organization, improve your Safety Management System (SMS), and excel in benchmarking safety culture: IATA - I-ASC: IATA Aviation Safety Culture Survey

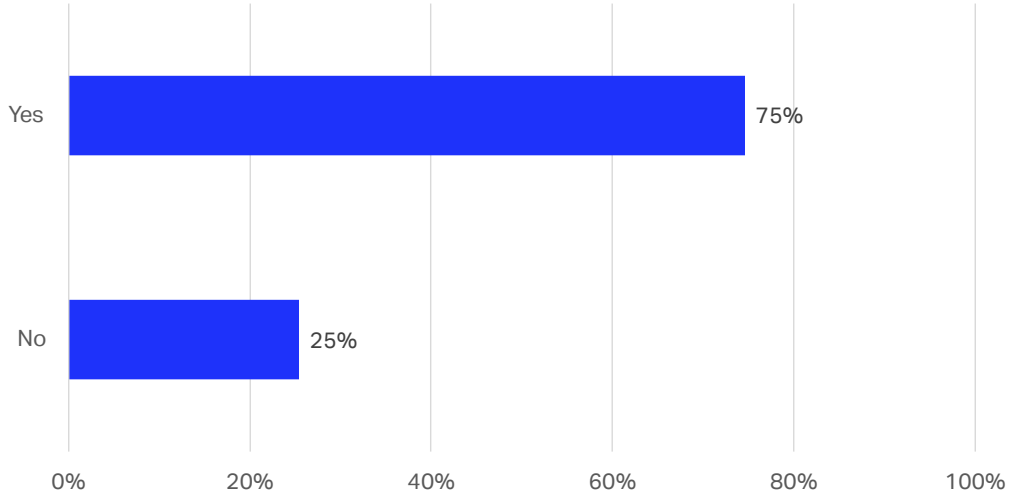
Change Management

Most airlines (74.60%) include Human Factors/Human Performance elements in their change management process, indicating a strong recognition of the importance of these factors in organizational changes.

However, a significant minority (25.40%) do not, suggesting room for improvement in integrating Human Factors/Human Performance considerations across the change management process.

Q39: Do you include Human Factors/ Human Performance elements within your change management process?

Answered: 63 Skipped: 9



- Yes: 74.60% (47 responses)
- No: 25.40% (16 responses)

Changes for which Airlines Consider HF Elements

Most airlines consider Human Factors elements primarily in changes to their operating systems, Safety Management Systems, and routes.

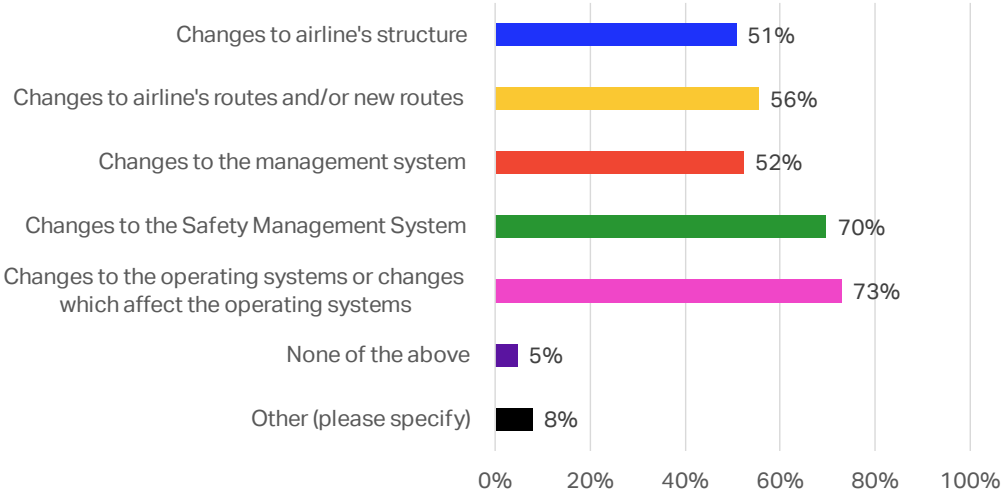
- Changes to the operating systems or changes which affect the operating systems: 73.02% (46 respondents)
- Changes to the Safety Management System: 69.84% (44 respondents)
- Changes to airline's routes and/or new routes: 55.56% (35 respondents)
- Changes to the management system: 52.38% (33 respondents)
- Changes to airline's structure: 50.79% (32 respondents)
- None of the above: 4.76% (3 respondents)
- Other (please specify): 7.94% (5 respondents)

The survey results indicate that airlines are recognizing the importance of integrating Human Factors (HF) elements into various organizational changes.

Airlines are increasingly adopting HF considerations in various aspects of their operations, reflecting a commitment to continuous improvement and proactive risk management.

Q40: For which changes does your organization consider Human Factors elements? (Select all applicable options)

Answered: 63 Skipped: 9



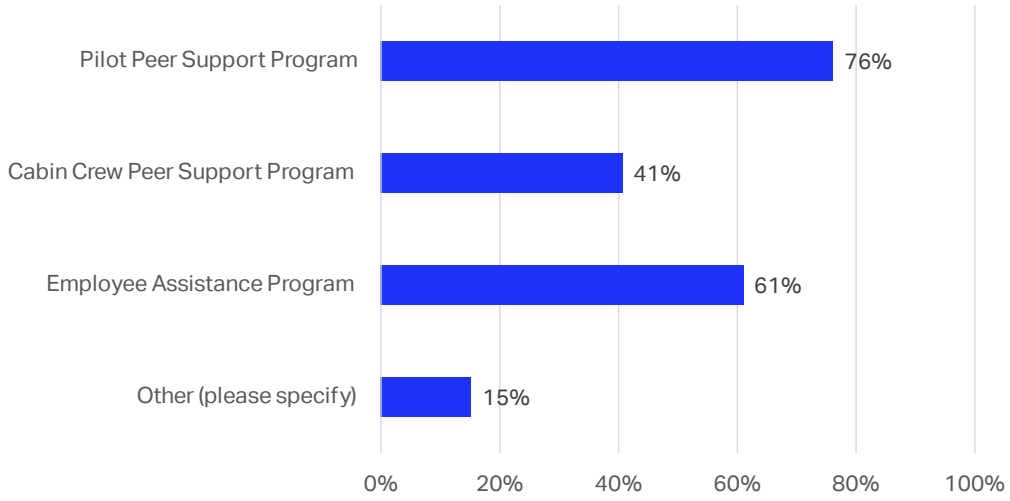
Health and Wellbeing

The presence of Health and Wellbeing programs, such as Pilot Peer Support Programs and Employee Assistance Programs, indicates a proactive approach to enhancing Human Factors and human performance within the organization. These programs contribute significantly to the overall Safety and well-being of employees by providing support and resources to manage stress, fatigue, and other Human Factors related issues.

Based on the survey responses, 76.27% of airlines reported having a Pilot Peer Support Program, 40.68% have a Cabin Crew Peer Support Program, and 61.02% have an Employee Assistance Program. This demonstrates a strong commitment within the industry to support the mental and physical health of their staff, which is crucial for maintaining high levels of performance and Safety.

Q41: What are the main elements of your Health and Wellbeing program that contribute to the improvement in Human Factors/ Human Performance in your organization? Example: Pilot Peer Support Program, Employee Assistance Program, etc.

Answered: 59 Skipped: 13



- Pilot Peer Support Program: 76.27% (45 responses)
- Cabin Crew Peer Support Program: 40.68% (24 responses)
- Employee Assistance Program: 61.02% (36 responses)

Wellbeing and IATA Safety Issue Hub

The Hub is an internationally recognized repository of aviation hazards and safety risks to enable the prioritization and delivery of aviation safety improvement programs, for the benefit of reducing global accidents in aviation.

We invite you to explore the Safety Issue Hub (SIH) on the IATA Connect platform. Discover vital safety information and guidance material and connect with safety practitioners worldwide. Join the community and stay updated on safety-related topics.

Find more wellbeing-related documents on the IATA Safety Issue Hub: Wellbeing (pilot/cabin crew/ATCO/engineers/all roles) | IATA Connect.

HF/ HP-related Indicators

Q42 Please list the Human Factors/ Human Performance-related indicators that you have defined in your airline

The survey responses indicate a varied approach to defining Human Factors (HF) and Human Performance (HP) indicators across different airlines. While some airlines have established comprehensive indicators, others are still in the process of developing or have not yet defined specific indicators. Here are the key points:

Common Indicators:

- **Fatigue Reports:** Many airlines use fatigue reports as a primary indicator to monitor crew fatigue levels.

- **Compliance and Non-compliance:** Indicators related to adherence to company policies and procedures are frequently mentioned.
- **Behavioural Markers:** Observational behaviours and performance evaluations are used to assess HF/HP aspects.
- **Safety Performance Indicators (SPIs):** Some airlines have specific SPIs related to HF, such as NMAC (Near Mid-Air Collision), taxiway excursions, altitude deviations, and intentional non-compliance.

Challenges:

- **Lack of Standardization:** There is a need for standardized HF/HP indicators across the industry to ensure consistency and comparability.
- **Integration:** Integrating HF/HP indicators into existing Safety Management Systems and operational processes remains a challenge for some airlines.
- **Awareness and Training:** Increasing awareness and training on HF/HP indicators among staff is crucial for effective implementation.

Overall, the survey highlights the importance of defining and implementing HF/HP indicators to improve Safety and performance in the aviation industry. Collaboration and sharing best practices among airlines can help address the challenges and enhance the effectiveness of HF/HP programs.

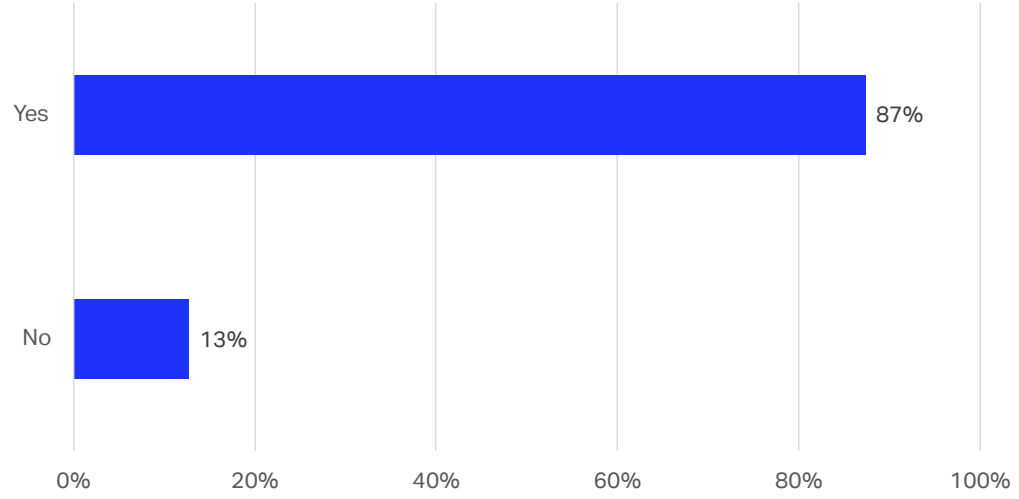
HF and HP Communications

Most airlines (87.3%) include topics associated with Human Factors (HF) and Human Performance (HP) in their internal Safety communications. This indicates a strong commitment to integrating HF/HP considerations into their Safety culture.

This proactive approach helps in mitigating risks associated with human errors, fatigue, stress, and other performance-related issues, ultimately contributing to safer and more effective airline operations.

Q43: Do the Safety internal communications in your airline include topics associated with Human Factors/ Human Performance?

Answered: 63 Skipped: 9



- Yes: 87.30% (55 responses)
- No: 12.70% (8 responses)

IATA Connect

The IATA Connect platform was launched during the IATA World Safety and Operations Conference (WSOC) in October 2024. Designed for airlines, regulators, auditors, and supporting organizations, this website and app facilitate all IOSA auditing activities, Safety Risk Identification and Management (via the Safety Issue Hub), and safety and operational-related discussions, questions, resources, and guidance (through Safety Connect).

Through the site, airlines can access and share their audit reports with partners, report safety issues, accidents, and incidents, and seek guidance and information regarding best practices, changes in regulation, management of risk, and other challenges faced in safety management.

A key feature of IATA Connect is peer-to-peer discussions, allowing industry professionals to collaborate on shared safety challenges. Several discussion groups focus on specific safety disciplines such as Human Factors and Fatigue, Cabin, Flight, Ground, Cargo, IOSA, as well as regional interests. Within these groups, users can raise questions, post updates and news, and discuss topics and/or regional issues which are affecting their operation to identify the best solutions through working together.

IATA encourages all readers with an interest in Safety Management and Operations to join the IATA Connect resource as follows:

- Login to the IATA Customer Portal: IATA │Login using a company-related email address, creating an account if one is not already active.
- Go to SERVICES > AVAILABLE SERVICES.
- Identify IATA Connect in the available services list and ENABLE SERVICE.

Once enabled, the service can be accessed directly at https://ic.iata.org or through the IATA Connect APP which is available on both Android and iOS app stores, using the Customer Portal login credentials.

External Sources for Learning

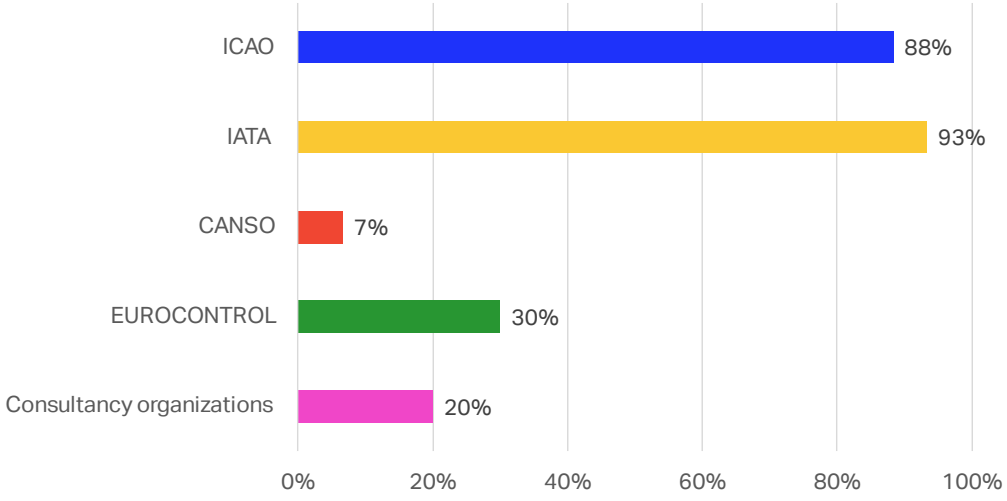
The survey results indicate that airlines predominantly rely on several key external sources to enhance their understanding and implementation of Human Factors (HF) and Human Performance (HP) practices. The most frequently utilized sources include:

- **International Air Transport Association (IATA):** Utilized by 93.33% of respondents, IATA provides comprehensive guidelines, training, and best practices that are crucial for airlines to maintain high standards in HF and HP.
- **International Civil Aviation Organization (ICAO):** 88.33% of airlines refer to ICAO, which offers global standards and regulations that ensure Safety and efficiency in aviation operations.
- **Eurocontrol**: Used by 30% of respondents, EUROCONTROL supports European aviation with its expertise in air traffic management and Safety.
- **Consultancy Organizations:** 20% of airlines engage consultancy firms for specialized advice and tailored solutions in HF and HP.
- **Civil Air Navigation Services Organisation (CANSO):** provides valuable insights into air navigation service providers' best practices (6.67%).

Additionally, airlines also benefit from other sources such as academic institutions and regulatory bodies like the Federal Aviation Administration (FAA) and the European Union Aviation Safety Agency (EASA). These sources collectively contribute to a robust framework for improving Safety, efficiency, and overall performance in the aviation industry.

Q44: Which external sources does your airline use to learn about Human Factors/ Human Performance?

Answered: 60 Skipped: 12



- ICAO: 88.33% (53 responses)
- IATA: 93.33% (56 responses)
- CANSO: 6.67% (4 responses)
- EUROCONTROL: 30% (18 responses)

- Consultancy organizations: 20% (12 responses)

Optimizing Performance: Fatigue Management Strategies

Fatigue is now acknowledged as a hazard that predictably degrades various types of human performance and can contribute to aviation accidents and incidents. Fatigue is inevitable in 24/7 operations because the human brain and body function optimally with unrestricted sleep at night. Therefore, as fatigue cannot be eliminated, it must be managed.

Fatigue management refers to the methods by which Operators and operational personnel address the safety implications of fatigue. In general, the ICAO Standards and Recommended Practices (SARPs) support two distinct approaches for fatigue management: a prescriptive approach and a performance-based approach.

Prescriptive approach

In the prescriptive fatigue management approach, operations must remain within prescribed limits established by the regulator for flight time, flight duty periods, duty periods and rest periods. In addition, an operator should manage fatigue hazards using the SMS processes that are in place for managing other types of hazards.

Performance-based regulatory approach

The operator develops and implements a Fatigue Risk Management System (FRMS) that is approved by the regulator. An FRMS allows an operator to adapt policies, procedures and practices to the specific conditions that create fatigue in a particular aviation setting. Operators may tailor their FRMS to unique operational demands and focus on fatigue mitigation strategies that are within their specific operational environment.

There is no “off-the-shelf” version of an FRMS, each operator will need to develop an FRMS appropriate to its organizational and operational specificity and the nature and level of the fatigue risk(s).

Dedicated Personnel for Fatigue Management

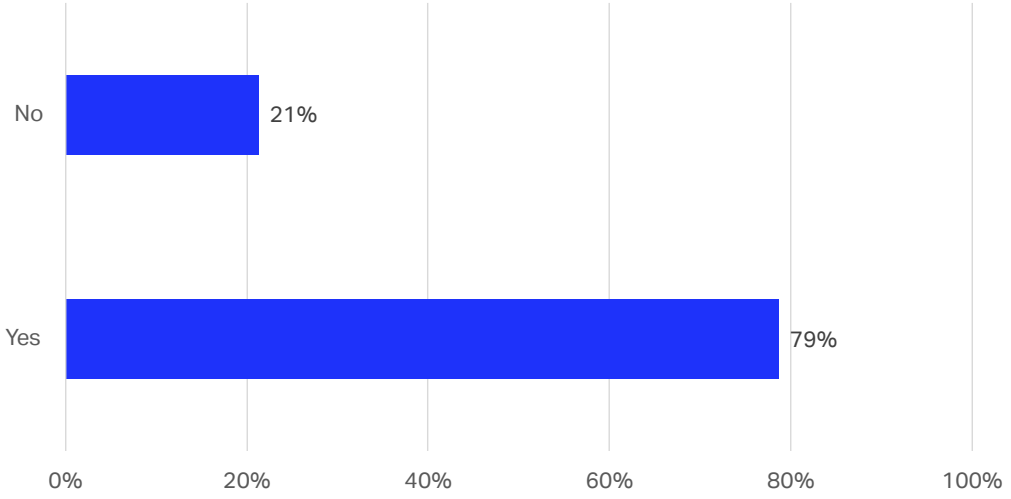
Having dedicated personnel ensures that there is a focused and systematic approach to identifying, monitoring, and mitigating fatigue-related issues. This proactive strategy contributes significantly to safer airline operations by ensuring that fatigue management is consistently prioritized and effectively implemented.

Most airlines (78.6%) have dedicated personnel or teams responsible for managing Fatigue Management. This indicates a strong commitment to addressing fatigue-related risks and enhancing human performance within their operations.

However, 21.4% of respondents indicated that they do not have dedicated personnel or teams for Fatigue Management, highlighting an area for potential improvement.

Q46: Do you have a person, or a team dedicated to Fatigue Management?

Answered: 61 Skipped: 11



- Yes: 78.69% (48 responses).
- No: 21.31% (13 responses).

Implementation of FRMS or FRMP

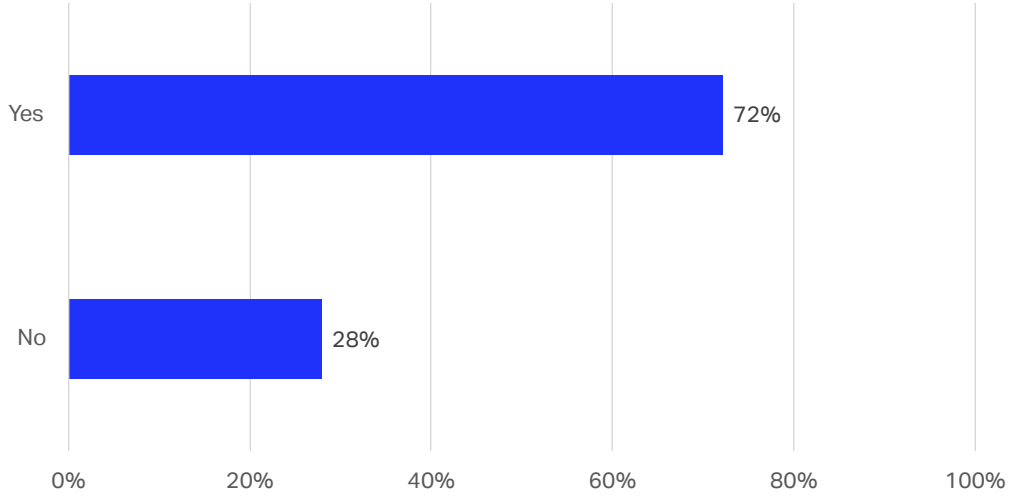
The implementation of Fatigue Risk Management Systems (FRMS) or Programs (FRMP) indicates a structured and proactive approach to managing fatigue-related risks within the organization. Having an FRMS or FRMP enhances the organization's ability to systematically identify, monitor, and mitigate fatigue issues, thereby improving overall Safety and performance.

Based on the survey responses, 72.13% of airlines reported having implemented an FRMS or FRMP. This indicates a substantial commitment within the industry to proactively manage fatigue and its impact on human performance.

However, 27.87.4% of respondents indicated that they have not implemented an FRMS or FRMP, highlighting an area for potential improvement. These airlines may benefit from developing and implementing fatigue management systems to align with industry best practices and enhance their Safety outcomes.

Q47: Do you have a Fatigue Risk Management System or Fatigue Risk Management Program (FRMP) implemented?

Answered: 61 Skipped: 11



- Yes: 72.13% (44 responses).
- No: 27.87% (17 responses).

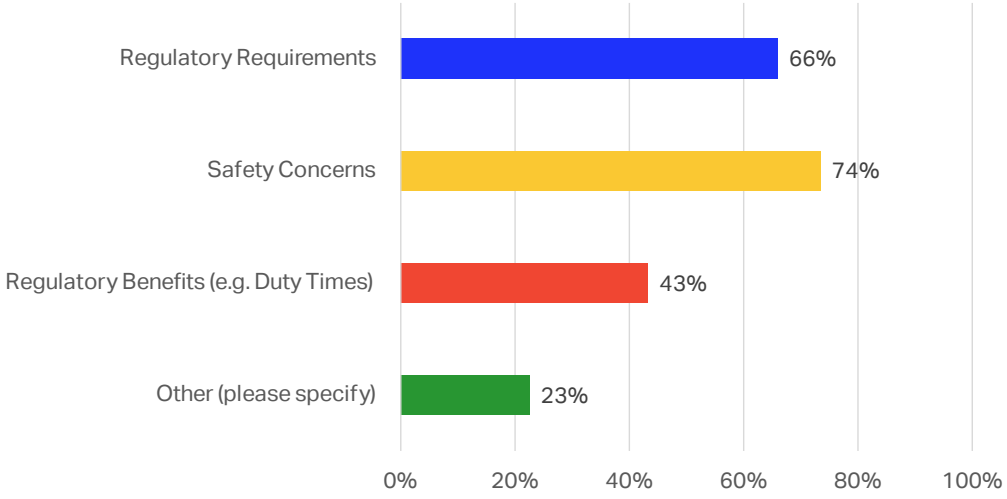
Reasons for Implementing FRMS/FRMP

Organizations implement FRMS/FRMP primarily due to Safety concerns (73.58%) and regulatory requirements (66.04%). These systems help ensure compliance with aviation regulations and enhance overall Safety by proactively managing fatigue risks.

Additionally, regulatory benefits such as extended duty times can be achieved through FRMS, allowing airlines to operate more efficiently while maintaining high Safety standards.

Q48: Why does your organization decide to implement the FRMS?

Answered: 53 Skipped: 19



- Safety Concerns: 73.58% (39 responses).
- Regulatory Requirements: 66.04% (35 responses).
- Regulatory Benefits: 43.40% (23 responses).
- Other: 22.64% (12 responses).

Integration of FRMS and FRMP into HF/ HP Programs

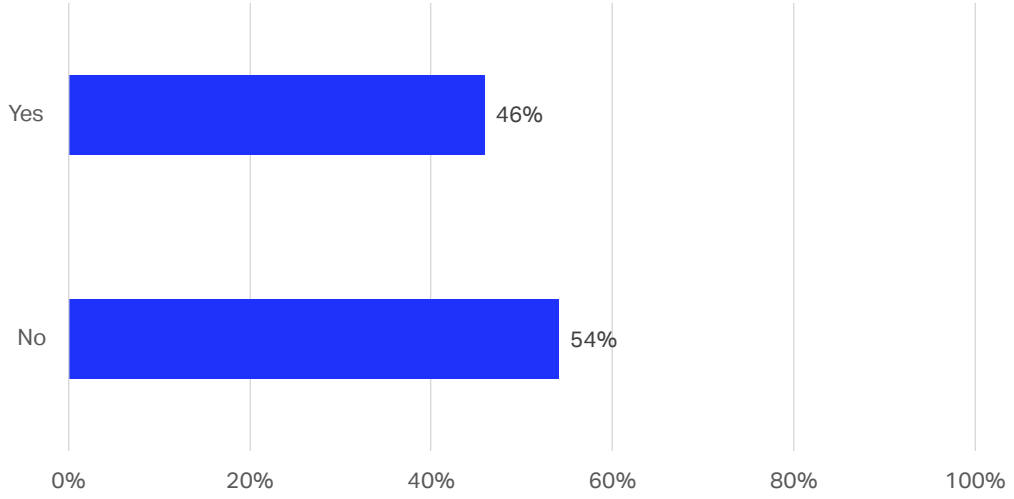
The integration of Fatigue Risk Management Systems (FRMS) into Human Factors (HF) programs indicates a comprehensive and holistic approach to managing human performance and Safety within the organization. Integrating FRMS into HF programs enhances the organization's ability to systematically address fatigue-related issues alongside other Human Factors, thereby improving overall Safety and performance.

Based on the survey responses, 45.90% of airlines reported having integrated FRMS into their HF programs. This indicates a substantial commitment within the industry to proactively manage fatigue and its impact on human performance as part of a broader HF strategy.

However, 54.10% of respondents indicated that they have not integrated FRMS into their HF programs, highlighting an area for potential improvement.

Q49: Is the FRMS/FRMP integrated into the Human Factors/Human Performance Program in the airline?

Answered: 61 Skipped: 11



- Yes: 45.90% (28 responses).
- No: 54.10% (33 responses).

Integration of FRMS and FRMP into SMS

The survey indicates that 77.05% of the airlines have integrated their Fatigue Risk Management System (FRMS) or Fatigue Risk Management Program (FRMP) into their Safety Management System (SMS). This integration is crucial as it ensures that fatigue-related risks are managed within the broader Safety framework of the airline.

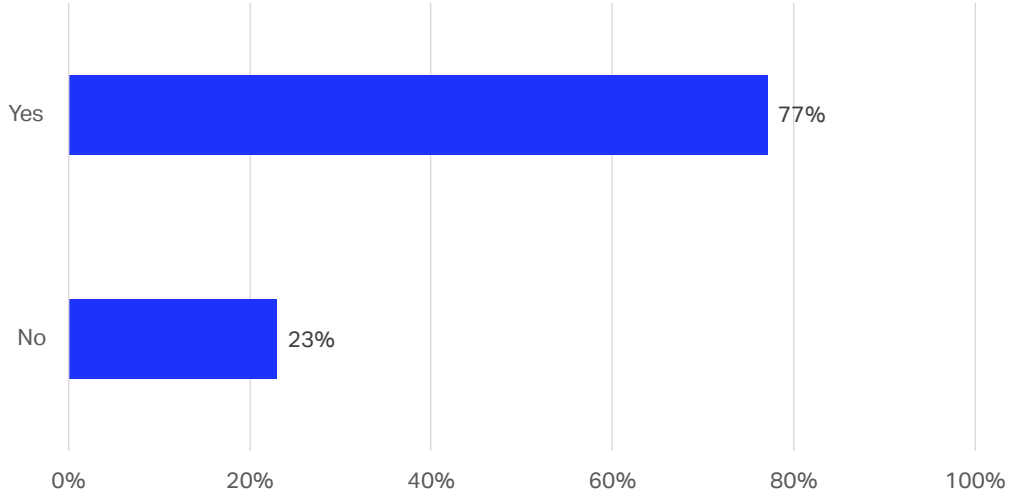
This integration typically involves:

- Safety Policies: Fatigue management policies are included in the airline's Safety manuals and procedures, providing clear guidelines for managing fatigue risks.
- Risk Management: Fatigue risks are managed within the broader framework of the SMS, ensuring that fatigue-related Safety concerns are addressed alongside other operational risks.
- Safety Assurance: Continuous monitoring and assessment of fatigue-related risks are conducted to ensure that the FRMS/FRMP is functioning effectively and meeting Safety objectives.
- Safety Promotion: Efforts to raise awareness about fatigue and its impact on Safety are part of the airline's overall Safety promotion activities.

This integration helps airlines to systematically address fatigue as a Safety concern, leveraging the established processes and resources of their SMS to enhance overall Safety performance.

Q50: Are the FRMS/FRMP integrated into the Safety Management System in the airline?

Answered: 61 Skipped: 11



- Yes: 77.05% (47 responses).
- No: 22.95% (14 responses).

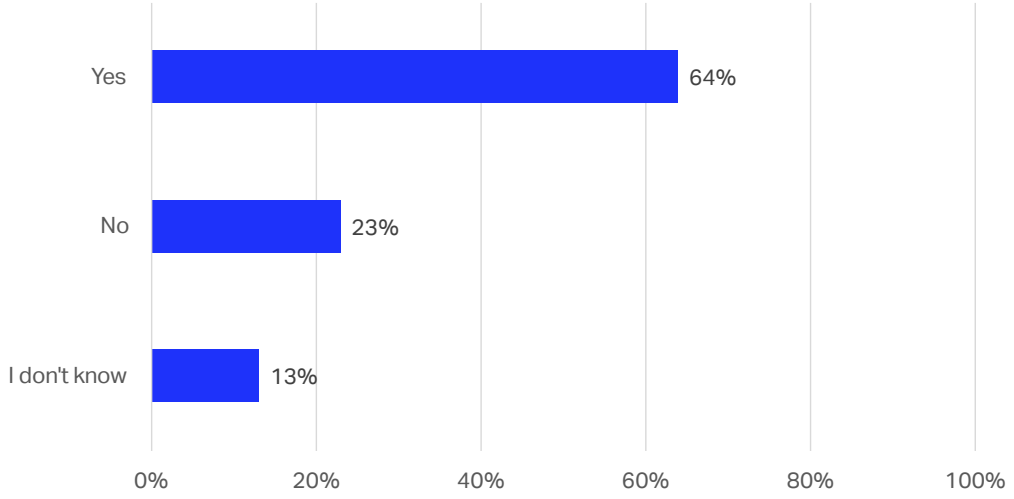
Fatigue Management Regulations

The presence of fatigue management regulations published by the National Civil Aviation Authority (NCAA) indicates a commitment to addressing fatigue-related risks in aviation. These regulations provide a framework for airlines to implement effective Fatigue Risk Management Systems (FRMS) or Fatigue Risk Management Programs (FRMP), ensuring that fatigue is systematically managed and mitigated.

Based on the survey responses, 63.93% of airlines reported having fatigue management regulations published by their NCAA. This demonstrates a significant level of regulatory support for fatigue management within the industry. However, 22.95% of respondents indicated that they do not have such regulations, and 13.11% were unsure, highlighting areas where regulatory guidance could be strengthened or clarified.

Q51: Are there Fatigue Management (Prescriptive, FRMS) regulations published by the National Civil Aviation Authority of your Country?

Answered: 61 Skipped: 11



- Yes: 63.93% (39 responses).
- No: 22.95% (14 responses).
- I don´t know: 13.11% (8 responses).

IATA Global Prescriptive Fatigue Management Regulations

We are pleased to share our summary of Prescriptive Fatigue Management Regulations from various countries around the globe. This valuable resource is the result of a collaborative effort by experts from the IATA Safety Group and the IATA Human Factors Task Force.

You can access the file through this link: Global Prescriptive Fatigue Management Regulations Final PDF version.xlsx

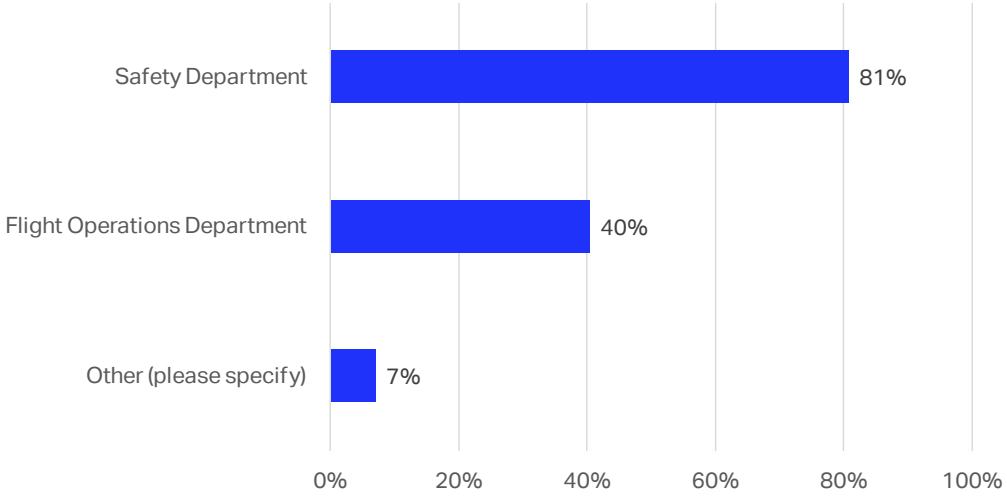
Departments in Charge of FRMS/ FRMP

The presence of a dedicated department for managing the Fatigue Risk Management System (FRMS) or Fatigue Risk Management Program (FRMP) within an airline signifies a focused and systematic approach to addressing fatigue-related issues. This dedicated department ensures that fatigue management is integrated into the airline's operations, promoting Safety and enhancing human performance.

Based on the survey responses, 80.70% of airlines have their Safety Department in charge of FRMS/FRMP, and 40.35% of airlines have their Flight Operations Department responsible for FRMS/FRMP, reflecting also that some operators have joint responsibility between both Departments. Additionally, 7.02% of airlines have other departments overseeing FRMS/FRMP, showcasing diverse approaches to fatigue management across the industry.

Q52: Which department is in charge of FRMS/FRMP?

Answered: 57 Skipped: 15



- Safety Department: 80.70% (46 responses).
- Flight Operations Department: 40.35% (23 responses).
- Other (please specify): 7.02% (4 responses).

Fatigue Management Elements

The implementation of various fatigue management elements within airlines demonstrates a proactive approach to mitigating fatigue-related risks and enhancing overall Safety. The presence of a Fatigue Reporting Form, Fatigue Policy and Fatigue Manual indicates a structured framework for addressing fatigue issues systematically.

Key Findings:

- 86.89% of airlines have a Fatigue Reporting Form, highlighting the industry's commitment to capturing and addressing fatigue-related incidents.
- 77.05% of airlines have a Fatigue Policy, ensuring that guidelines and procedures are in place to manage fatigue effectively.
- 73.77% of airlines have an Unfit for Duty due to Fatigue Reporting mechanism, allowing crew members to report fatigue without repercussions.
- 72.13% of airlines consider fatigue in their investigations, ensuring that this issue is thoroughly analysed in incident reviews.
- 68.85% of airlines have a Fatigue Safety Action Group, emphasizing collaborative efforts to monitor and mitigate fatigue risks.
- 60.66% of airlines engage in Fatigue Communications, promoting awareness and education on fatigue management.
- 63.93% of airlines have defined Safety Performance Indicators related to fatigue, enabling continuous monitoring and improvement.
- 57.38% of airlines utilize Biomathematical Models to predict and manage fatigue, showcasing the integration of scientific tools in fatigue management.

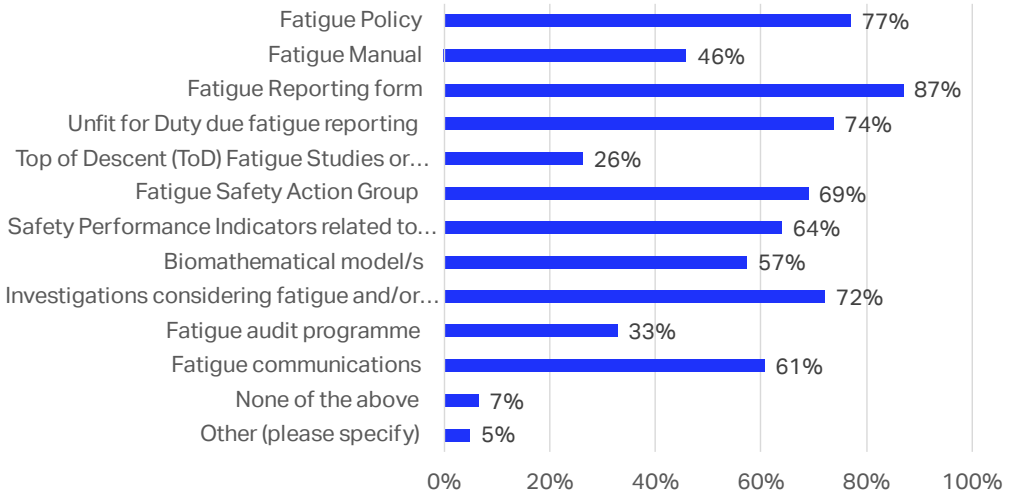
Areas for Improvement:

- Top of Descent (ToD) Fatigue Studies or Monitoring is implemented by only 26.23% of airlines, indicating a potential area for further development.
- Fatigue Audit Programs are in place in 32.79% of airlines, suggesting that more comprehensive auditing could enhance fatigue management practices.

Overall, the survey responses indicate a strong industry commitment to managing fatigue through structured policies, reporting mechanisms, and collaborative efforts. However, there is room for improvement in specific areas such as ToD fatigue studies and fatigue audit programs to further enhance Safety and performance.

Q53: Which of the following elements does your airline already have in place? Select all applicable.

Answered: 61 Skipped: 11



- Fatigue Policy (47 responses).
- Fatigue Manual (28 responses).
- Fatigue Reporting form (53 responses).
- Unfit for Duty due fatigue reporting (45 responses).
- Top of Descent (ToD) Fatigue Studies or Monitoring (16 responses).
- Fatigue Safety Action Group (42 responses).
- Safety Performance Indicators related to fatigue (39 responses).
- Biomathematical model/s (35 responses).
- Investigations considering fatigue and/or Human Factors (e.g. HFACS) (44 responses).
- Fatigue audit programme (20 responses).
- Fatigue communications (37 responses).
- None of the above (4 responses).
- Other (please specify) (3 responses).

FRMS Implementation: Positive outcomes

Q54 What positive outcomes do you see in implementing FRMS/ FRMP at your company? Please elaborate

The implementation of a Fatigue Risk Management System (FRMS) within an airline demonstrates a proactive approach to managing fatigue-related risks. By systematically addressing fatigue, airlines can enhance operational Safety and improve crew wellbeing.

Survey responses indicate that airlines recognize several positive outcomes from implementing FRMS/FRMP. These include:

- better identification and management of fatigue risks
- improved crew alertness, and
- enhanced overall Safety

Additionally, FRMS allows for more effective pairing construction and scheduling, reducing fatigue risk and optimizing operational efficiency.

FRMS Implementation: Obstacles

Q55 What obstacles do you see in in implementing FRMS/ FRMP? Please elaborate

The survey also highlights obstacles in implementing FRMS/FRMP, such as:

- regulatory challenges
- resource constraints, and
- the need for cultural change within organizations and regulators

Addressing these obstacles requires comprehensive support, including training, guidance materials, and collaboration with industry stakeholders.

Overall, the commitment to FRMS/FRMP reflects a significant step towards mitigating fatigue-related risks and fostering a safer, more efficient aviation environment.

Partnering for Success: IATA's Support in Human Factors and Fatigue Management

HF/ HP Topics of Interest

Q45 Please list the top 3 Human Factors/ Human Performance topics of interest to your airline that you would like to develop/ improve in collaboration with IATA

The survey results highlight three key areas of interest for airlines in collaboration with IATA:

- **Fatigue Management:**
  Fatigue is consistently identified as a critical factor affecting Safety and performance. Effective fatigue management can enhance crew alertness, reduce errors, and improve overall operational Safety.
  Airlines seek to develop comprehensive fatigue risk management systems (FRMS) and programs (FRMP), including training, data collection, and proactive mitigation strategies.

- **Communication and Decision-Making:**
  Effective communication and decision-making are vital for safe operations, especially in multicultural cockpits. These factors influence situational awareness, teamwork, and leadership.
  Airlines aim to enhance training programs that focus on cognitive biases, leadership, and communication skills to improve decision-making processes and reduce errors.

- **Human Factors Integration:**
  Integrating Human Factors into Safety management systems (SMS) and operational procedures is crucial for identifying and mitigating risks associated with human performance.

Also, airlines are interested in developing methodologies for assessing Human Factors, creating Human Factors key performance indicators (KPIs), and implementing best practices for Human Factors in non-operational functions.

Fatigue Management Support and Guidance

The availability of comprehensive support and guidance materials for Fatigue Risk Management Systems (FRMS) and Fatigue Risk Management Programs (FRMP) is crucial for enhancing Safety and operational efficiency within airlines. These materials provide essential tools and frameworks for effectively managing fatigue-related risks.

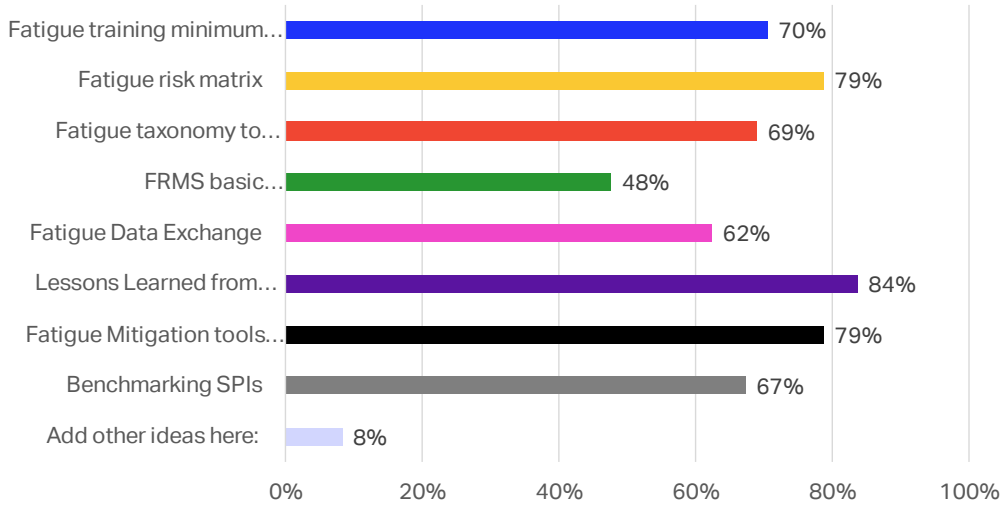
Based on the survey responses, 83.61% of airlines expressed interest in fatigue mitigation tools and data, indicating a strong demand for practical resources to address fatigue issues. Additionally, 78.69% of respondents highlighted the importance of lessons learned from other airlines, emphasizing the value of shared experiences and best practices in fatigue management.

Furthermore, 70.49% of airlines identified the need for a fatigue training minimum syllabus, underscoring the necessity of standardized training programs to ensure consistent and effective fatigue management across the industry. The interest in a fatigue risk matrix (78.69%) and a fatigue taxonomy to classify reports (68.85%) reflects the industry's commitment to systematically categorize and analyse fatigue-related data.

Overall, the survey responses demonstrate a substantial commitment within the aviation industry to enhance fatigue management practices through the adoption of comprehensive support and guidance materials. This commitment is essential for improving Safety, operational efficiency, and the well-being of airline personnel.

Q56: Which of the following support/guidance material would you find useful to have?

Answered: 61 Skipped: 11



- Fatigue training minimum syllabus (43 responses).
- Fatigue risk matrix (48 responses).
- Fatigue taxonomy to classify reports (42 responses).
- FRMS basic implementation plan (29 responses).
- Fatigue Data Exchange (38 responses).
- Lessons Learned from other airlines (51 responses).
- Fatigue Mitigation tools and data (48 responses).
- Benchmarking SPIs (41 responses).

IATA Fatigue Management documents available

To support operators in implementing fatigue management strategies, the IATA Human Factors Task Force (HFTF) has developed the following documents which can be found in the dedicated Fatigue Risk Management webpage here: https://www.iata.org/en/programs/safety/operational-safety/fatigue-risk/

- Common Protocol for Minimum Data Collection Variables in Aviation Ops
- Fatigue SPIs: A Key Component of Proactive Fatigue Hazard Identification
- IATA FRMS White Paper
- IATA HFTF White Paper on Uses and Limitations of Biomathematical Fatigue Models

The Fatigue Management Guide for Airline Operations marks the collaboration between IATA, ICAO and the International Federation of Airline Pilots' Associations (IFALPA) to jointly lead the industry in the ongoing development of fatigue management, using the most current science. It presents the common approach of pilots, regulators, and operators to the complex issue of fatigue.

Fatigue Management on the IATA Safety Issue Hub

Discover more documents related to Fatigue Management on the IATA Safety Issue Hub: Fatigue | IATA Connect

Key Areas of Support Needed

Q57 What kind of support would you need to get from IATA in Human Factors and Fatigue Management related topics? Please elaborate

The survey responses indicate a strong interest among airlines in receiving support from IATA on Human Factors (HF) and Fatigue Management (FM) related topics.

Key Areas of Support Needed:

- **Training and Implementation:** Airlines expressed a need for guidance on implementing HF and FM programs, including training materials and best practices. This support would help standardize approaches across the industry and ensure effective integration into existing Safety management systems.

- **Data and Metrics:** There is a demand for tools to assess and monitor fatigue and Human Factors, such as fatigue risk matrices, taxonomies, and benchmarking Safety performance indicators (SPIs). These tools would enable airlines to better understand and mitigate risks associated with fatigue and human performance.

- **Collaboration and Knowledge Sharing:** Airlines are looking for opportunities to learn from each other through data exchange, lessons learned, and benchmarking. Collaborative efforts facilitated by IATA would foster a culture of continuous improvement and innovation in HF and FM practices.

The survey highlights a significant opportunity for IATA to play a pivotal role in advancing Human Factors and Fatigue Management within the aviation industry. By providing targeted support, training, and facilitating collaboration, IATA can help airlines enhance their Safety and operational performance, ultimately contributing to a safer and more efficient global aviation system.

Closing Thoughts: Navigating Core Challenges

The survey provides valuable insights into the implementation and integration of Human Factors and Human Performance programs within airlines globally. It highlights the importance of comprehensive HF/HP programs, cross-departmental interfaces, dedicated fatigue management teams, and continuous learning from external sources.

Based on the survey results, several key challenges have been identified in the implementation and management of Human Factors (HF) and Human Performance (HP) programs within airlines.

Regulatory Compliance

A significant portion of airlines (48.61%) have HF regulations published by their National Civil Aviation Authority, indicating a level of regulatory support for HF initiatives. There is a need for greater awareness and compliance, as 34.72% of respondents indicated the absence of HF regulations, and 16.67% were unaware of such regulations. This indicates a gap in regulatory guidance and compliance. Engaging with regulators and staying informed about regulatory updates are crucial steps to address this challenge.

Integration and Implementation

Most airlines (73.61%) have integrated HF/HP programs into their Safety Management Systems (SMS), demonstrating a commitment to comprehensive Safety management.

A significant portion (26.39%) have not integrated HF/HP programs into their SMS suggesting challenges in fully embedding HF/HP into broader Safety frameworks, and 34.78% have not established cross-department interfaces to manage HF/HP, highlighting difficulties in cross-functional collaboration. Holistic integration and cross-department collaboration are essential to overcome these challenges.

Policy and Documentation

Some airlines have developed HF policies and manuals, with 45.59% having HF policies integrated into other documents.

There is a need for more structured documentation, as 42.65% do not have a formal HF policy, and 61.76% do not have an HF manual, indicating a need for more structured documentation and guidelines. Developing comprehensive policies and regularly updating them can address this gap.

Training and Evaluation

HF training programs cover various operational roles, with high coverage for flight crew (89.23%), cabin crew (83.08%), and maintenance staff (70.77%). And 50.77% of respondents indicated that HF/HP training is not integrated between operational areas, suggesting challenges in cohesive training programs.

Integration of HF considerations into performance evaluations and technical training assessments is limited, with only 40% including HF aspects in Human Resources (HR) performance evaluations. And 41.94% align HR aspects with behavioural markers assessed in technical trainings. This shows a gap in integrating HF considerations into performance management.

Developing integrated training programs and incorporating behavioural markers into evaluations can enhance training effectiveness.

Fatigue Management

Many airlines have dedicated teams for fatigue management (78.69%) and have implemented Fatigue Risk Management Systems (FRMS) (72.13%).

Some airlines (21.31%) do not have teams dedicated to fatigue management, and 27.87% have not implemented Fatigue Risk Management Systems (FRMS).

There is room for improvement in integrating FRMS into HF/HP programs and SMS, as 54.10% have not integrated FRMS into HF/HP programs, and 22.95% have not integrated FRMS into SMS. Establishing dedicated fatigue management teams and implementing comprehensive FRMS can address these challenges.

Safety Culture and Change Management

Most airlines conduct Safety culture surveys (80.95%), which are crucial for understanding and improving organizational Safety culture and include HF elements in their change management processes (74.60%).

There is a need for more inclusive change management practices, as 25.40% do not include HF elements in their change management processes. Conducting regular Safety culture surveys and involving employees in change management can enhance organizational Safety culture.

External Learning and Support

Airlines widely use external resources from IATA (93.33%) and ICAO (88.33%) to learn about HF/HP. Leveraging a broader range of external resources and participating in industry forums can enhance knowledge sharing and continuous improvement.

The survey results reveal several challenges in regulatory framework, integration and implementation of HF/HP programs, policy and documentation, training and evaluation, fatigue management, Safety culture, change management, and external learning.

Addressing these challenges requires a concerted effort to enhance regulatory compliance, improve cross-departmental collaboration, develop comprehensive policies and manuals, integrate HF considerations into performance evaluations, establish dedicated fatigue management teams, conduct regular Safety culture surveys, and leverage external resources for continuous improvement.

Actionable Insights: Best Practices and Recommendations

To address the identified challenges and enhance HF/HP programs, airlines should consider the following best practices and recommendations:

1. **Engage with Regulators:** Actively participate in industry forums and working groups to advocate for Human Factors (HF) regulations and ensure compliance. Share best practices and lessons learned with regulatory bodies.

2. **Stay Informed:** Regularly review updates from national and international aviation authorities to stay in compliance with the latest Human Factors regulations.

3. **Ensure Compliance:** Adhere to the latest applicable Human Factors regulations to avoid potential penalties. Additionally, ensure conformity with IOSA standards and recommended practices related to Human Factors and Fatigue Risk Management as outlined in the latest edition of the IOSA Standard Manual (ISM).

4. **Leverage External Resources:** Utilize a wide range of external resources and participate in industry conferences, workshops, and webinars to share knowledge and learn from peers.

5. **Subscribe to Newsletters:** Subscribe to newsletters from ICAO, EASA, your national aviation authority, etc., to stay updated on best practices and emerging trends in Human Factors/Human Performance.

6. **Join Industry Groups:** Such as the Human Factors and Fatigue Group at IATA Connect and contribute to industry discussions on Human Factors/Human Performance.

7. **Benchmark Programs:** Compare your Human Factors/Human Performance programs against those of other airlines and Air Navigation Service Providers (ANSP) to identify areas for improvement and adopt best practices.

8. **Participate in Studies:** Engage in benchmarking studies and share your best practices with other organizations.

9. **Holistic Integration:** Embed Human Factors/Human Performance programs into the Safety Management System (SMS) for a comprehensive approach to Safety, integrating Human Factors considerations into all Safety processes and procedures.

10. **Integrate Risk Assessments:** Incorporate Human Factors risk assessments into your SMS processes and procedures.

11. **Cross-Department Collaboration:** Establish clear interfaces and communication channels between departments such as Occupational Health and Safety (OHS), Human Resources (HR), Training, Safety, and Flight Operations. Regular cross-functional meetings can help align Human Factors initiatives.

12. **Regular Meetings:** Hold regular cross-functional meetings to discuss Human Factors issues and share best practices.

13. **Develop Comprehensive Documentation:** Create a detailed Human Factors manual outlining the organization's approach to managing Human Factors. Ensure the document is accessible to all employees.

14. **Develop HF Policy and procedures:** Formulate a Human Factors policy that outlines the organization's commitment to Human Factors and defines specific procedures for Human Factors risk management.

15. **Regular Updates:** Periodically review and update Human Factors policy, manual and procedures to reflect changes in regulations, industry standards, and organizational practices. Schedule annual reviews and involve key stakeholders in the update process.

16. **Integrated Training Programs:** Develop Human Factors training programs that cover all operational areas and incorporate behavioural markers into performance evaluations.

17. **Diverse Training Methods:** Use a mix of classroom training, simulations, and on-the-job training to reinforce learning.

18. **Ongoing Training:** Ensure all employees understand and apply Human Factors principles in their roles. Provide ongoing Human Factors training and development opportunities, including refresher courses, workshops, and e-learning modules.

19. **Behavioural Markers:** Incorporate Human Factors behavioural markers into performance evaluations and technical training assessments to ensure Human Factors considerations are part of everyday operations.

20. **Assess Skills:** Use behavioural markers to evaluate communication, teamwork, and decision-making skills during training exercises.

21. **Dedicated Fatigue Management Teams:** Establish teams dedicated to managing fatigue risks, including representatives from various departments for a holistic approach. For example, form a Fatigue Risk Management Team with representatives from Human Resources, Safety, Flight Operations, and other relevant departments.

22. **Implement FRMS:** Develop and implement a Fatigue Risk Management System (FRMS) integrated into the Human Factors/Human Performance program and SMS. Regularly review and update the FRMS to address emerging risks.

23. **Utilize Data:** Use data from fatigue reports and biomathematical models to identify and mitigate fatigue risks.

24. **Fatigue Management Education:** Include fatigue management training in initial and recurrent training programs for all employees, including non-operational personnel. Promote awareness of the importance of managing fatigue.

25. **Conduct Safety Culture Surveys:** Regularly conduct Safety culture surveys to gauge the organization's Safety climate. Use the results to identify areas for improvement and track progress over time.

26. **Inclusive Change Management:** Incorporate Human Factors elements into all change management processes. Ensure that changes to the organization's structure, routes, management systems, and operating systems consider Human Factors impacts.

27. **Employee Involvement:** Involve employees in the change management process by seeking their input and feedback. This helps ensure changes are well-received and effectively implemented.

28. **Gather Feedback:** Hold town hall meetings and focus groups to gather employee feedback on proposed changes.

Implementing these best practices can help airlines overcome the challenges identified in the survey and enhance their Human Factors/Human Performance programs. The recommendations stress the value of collaboration among airlines and stakeholders to gather and disseminate industry-leading practices.

By fostering a culture of continuous improvement, collaboration, and learning, airlines can ensure that Human Factors are effectively managed, contributing to overall Safety and operational excellence.

The conclusions outlined in this Paper emphasize the IATA's role in providing guidance and support to airlines, helping them adopt and refine best practices.

By conducting follow-up studies and Strategy Papers, IATA can ensure continuous improvement and support for airlines in their journey towards excellence in Human Factors and Human Performance.

Appreciating Your Contribution

We especially thank the 72 airlines that generously completed our 57-question survey and shared their best practices with the industry. Your contributions are essential in advancing our collective knowledge.

We also wish to thank the members of the IATA Human Factors Task Force for their dedicated collaboration in disseminating the survey. Your efforts have been crucial to this initiative's success.

We welcome your feedback and insights at humanfactors@iata.org. Your comments are highly valued.