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SG 912: Aviation Safety Culture

Original Issue



Airlines for America
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Highlights

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Introduction

In late 2021, the Airlines for America Safety Council created the Safety Culture Working Group with the following objectives:

- Define safety culture
- Describe specific characteristics of safety culture
- Identify measurable indicators

The established working group referenced inside and outside industry materials, educational/academic references, U.S and international regulations and guidance and used their own subject matter expertise to create the following document.

This document is meant to serve as a guidepost for airlines evaluating safety culture. It is not necessarily meant to be a detailed roadmap on how to implement a safety culture.

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Chapter 1. Safety Culture Introduction

Corporate culture is complex, multi-layered and constantly evolving. There are a number of components that make up a company's culture. One of the key components is an organization's approach to safety, and its effects on personnel behavior, which will be referred to in this document as "safety culture". Over the years, safety culture has been an important and often discussed theoretical concept (particularly in the context of a Safety Management System (SMS)).[1] As the airline industry continues its journey into a more data driven, risk-based decision-making mindset, there is a need to shift from theory to a more practical understanding of safety culture. This can be achieved by defining safety culture, determining its key characteristics, developing measurements and interpreting the measurements of any given organization's safety culture. As noted above, safety culture is a subset of an organization's overall culture, and each influences the other.

1-1. Section – Scope

We have worked with several aviation industry subject matter experts and stakeholders to build a safety culture framework for the aviation industry. The scope of this paper will be to:

- Define safety culture for aviation purposes
- Identify drivers of safety culture
- Provide ways to measure safety culture
- Introduce ways to interpret those measurements of safety culture

The intent is to create guidance for the industry while allowing for flexibility of an organization's size and mission.

This paper is not meant to restrict or critique an organization but rather provide guidance to assist an aviation company in assessing their own safety culture.

[1] SMS is the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls. It includes systematic procedures, practices, and policies for the management of safety risk. (FAA Order 8000.369)

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Chapter 2. Safety Culture Definition

Prior to the work of A4A on safety culture, the aviation industry has not agreed upon a definition for safety culture. The FAA has no direct definition of safety culture per se, however, in AC-120-92B it describes safety culture as follows:

> *Safety Culture. Cultures are the product of the values and actions of the organization's leadership as well as the results of organizational learning. Cultures are not really "created" or "implemented;" they emerge over time and as a result of experience. Organizations cannot simply purchase a software program, produce a set of posters filled with buzzwords, require their people to attend an hour of slide presentations, and instantly install an effective SMS. As with the development of any skill, it takes time, practice and repetition, the appropriate attitude, a cohesive approach, and constant coaching from involved mentors.* (p. 3)

It is important for the aviation industry (e.g., airlines, airports, business partners, charter operations, air traffic control) to have a definition that aviation industry organizations can reference when thinking about their own safety culture and its evaluation.

2-1. Airlines for America Definition of Safety Culture

After studying multiple definitions of safety culture across multiple organizations and industries, the Airlines for America Safety Culture Working Group's current definition of Aviation Safety Culture is:

> *Safety culture, subject to the influences of overall culture, is the resultant characteristics and behaviors of an organization with respect to operational risk management. It describes the overall employee operational safety risk experience.*

2-2. Interpretation of Safety Culture Definition

Although the definition of safety culture is brief in principle, the interpretation of the different components of the definition shows the level of complexity associated with an organization's safety culture.

- The first component relates to the relationship between an organization's culture and its safety culture. Safety culture is always subjected to the influences of overarching organization's culture. Therefore, safety culture is not detached from the general culture

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of a given organization, both safety and organizational cultures do influence/impact one another. Just like any culture, safety culture is fluid, dynamic, and prone to change. The dynamic nature of an organization's safety culture is not unidirectional. Safety culture can change in positive, negative or neutral directions at any given point in time. These changes are influenced by the overarching organization's culture, change in leadership, external regulatory influences (e.g., FAA guidance), incident/accidents, environmental or other factors.

- The second component relates to the characteristics and behaviors of an organization with respect to the management of operational safety risk. It is driven by a set of standards and behavior patterns by which an organization operates. This is reflected by the organization's transmitted ideas, values, perceptions, and actions around safety and the management of operational safety risk. These characteristics are then used to assess the acceptable/unacceptable levels of safety risk at the organizational level which then serves as a guideline to assess individual members' adherence to the organization's safety principles and expected behaviors. These characteristics and behaviors lead to actions by stakeholders contributing to the employee operational safety risk experience.

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Chapter 3. Safety Culture Drivers

3-1. Introduction

"Accident investigations have identified a poor safety culture as a factor that increases the probability and severity of occurrence of accidents. The existence and understanding of an organization's safety culture is a prerequisite for successful and effective SMS. Consequently, to improve safety performance, it is necessary for all organizations to continuously improve their safety culture through a cycle of self-assessment, understanding and action. A strong and positive safety culture provides the foundation for aviation organizations to continuously improve safety and proactively mitigate risks, for example through voluntary reporting of safety hazards." (International Air Transport Association (IATA))

To understand and then influence safety culture, this section provides a breakdown of safety culture divided into a set of categories. These categories help focus continuous improvement efforts into actionable levers. These categories then become drivers to a stronger, more positive safety culture, thus improving the employee safety experience. These categories are also drivers that are specifically subject to management influence, thereby inclusive of what can be intentionally driven, rather than those that are not influenceable by management, such as weather, acts of nature, geopolitical situations, etc.

3-2. Safety Culture Drivers

The following nine safety culture drivers (many from IATA) encompass primary controllable influences that can affect a safety culture. The strength of each of these influences as well as the importance of the value to a particular work group will determine the magnitude and direction that each of these drivers affect safety culture within a particular work group. The drivers are interconnected and sometimes overlapping, as events and activities that drive culture are not limited to a single line of influence. The descriptions below offer some of the actionable possibilities that may be effective in an organization's safety culture continuous improvement. The strength and impact of each driver is unique to each organization; therefore, the following list is not in rank order.

1. Management Commitment
    - Management actions and reactions drive employee experiences and as such affect employees' perception of safety culture. The more an employee feels their manager takes safety matters seriously, the stronger they feel about the overall safety of the organization. Additionally, employees feeling that their suggestions for improving safety are taken into account by their immediate managers has a strong impact on the overall perceived safety. Consistency in what the managers say and what the mangers do will contribute to a strong safety culture among the workforce. Relatedly, the consistency in messaging up, down and across

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stakeholders with respect to operational safety reinforces a culture of safety. The perceived fairness in which mistakes are managed has a visible impact on employees' trust and confidence, thereby management's commitment to safety and fairness has a notable influence on safety culture.

2. Senior Management Commitment
    - The senior manager's commitment is often upstream of the front-line employees' perception of safety culture; however, the commitment's impact is real. Senior management, generally considered to be more than two levels removed from the front-line employee, up to and including board of directors or governing body, is typically responsible for balancing the commercial and operational priorities. The senior management is typically responsible for resourcing the operation, and when there is a competition between operational performance and safety, the delicate balance drives a perception among front line employees. The messaging and activities surrounding the resourcing and prioritization of compliance during pressure operations may fall largely in this driver. As a team manages operating conditions, the senior management commitment is informally graded commensurate with how supported the employees feel.
3. Co-worker Commitment
    - The running of an aviation organization typically requires teamwork in every function. Safety culture can be influenced by the confidence and competence one team feels about another. One team's output is often another team's input, and the quality of the first may drive the performance of the latter. The perception of the competence of a team and the degree of confidence another group or team has with that team drives a segment of culture that has to do with trust, dependability and even accountability. A low sense of confidence leaves others feeling like they are on their own, where a higher confidence will leave teams feeling that others are watching out for one another. Another indicator in this driver is the ability to address safety issues among peers, superiors and subordinates alike. The level of comfort in both delivering and receiving safety concerns amongst co-workers affects safety culture.
4. Personal Commitment / Empowerment
    - While co-worker commitment to safety is the perception of others, the driver of personal commitment is an internal/self perspective of that same commitment. The other part of this driver is how an individual feels about their ability to make or enact change that impacts safety.
5. Safety Awareness
    - The safety awareness driver is employees' knowledge of the things that they have to know to keep themselves and others doing their job safely. It is often limited to the initial training, the continuous improvement and their own commitment. The accuracy of training, and communications as they relate to the day-to-day responsibilities contribute to this driver. The reverse is also true, employees' perspectives being aligned with publications and senior management messaging indicates a strong safety awareness driver.
6. Communications
    - Clear and consistent two-way dialogue regarding safety matters is conducive to a strong safety culture. Communication must flow through multiple layers of

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management to get to the front line, and each front line group may require its own approach to keep it relevant, however the messaging needs to remain connected to the original intent. With respect to safety, having a significant amount of specific job-related information keeps the attention of the front-line employee. Having the communications relatable and two-way, will increase empowerment and engagement on safety matters. If conveying changes that will occur, the communication should include the reasoning behind why the changes will occur. Communications form the foundation of most of the safety culture drivers and need to be intentional. As a best practice, weaving safety related information and sentiment into routine communications is a force multiplier for other drivers. In doing so, safety is continuous and ubiquitous, not just a stand-alone message.

7. Policies. Procedures & Training
    - One fundamental purpose of aviation policies, procedures and training is to keep people and assets safe. Policies direct how things should be done. Procedures specify what is to be done. Training familiarizes employees with both of these. Ideally, policies, procedures and training are fully aligned. As work and working conditions evolve, there are often changes to one or all of these components, which makes it labor intensive to keep these factors in alignment. Compromises in alignment may cause confusion and/or variance in how work is done. This can create confusion at a minimum, but can also be an extraordinary gap in your operation if the gaps are in critical areas. This driver has a large impact on trust among team members and management. Aviation industries' change management process plays a vital role in helping to ensure alignment of the policy, procedures and training.
8. Continuous Improvement / Learning Organization
    - Maintaining or strengthening safety culture requires attention to continuous improvement and learning organization concepts. As an operation evolves, technology transforms, and different perspectives are brought into an organization, an opportunity to improve may arise. An organization's adaptability and ability to manage these changes are key to keeping the policies, procedures, and training updated. This adaptability and ability to manage changes leads to organizational resiliency. The employee's empowerment is affected by their ability to be heard, and feedback directly affects their willingness to continue to engage. This driver is directly related to the ability of an organization to ingest opportunities and act on them when deemed appropriate. The transparency, fairness and transmission of the results is a key factor in the strength of this driver. How an organization handles mistakes is additionally, an important component of this driver.
9. Reporting & Feedback
    - Employee safety reporting is a key indicator of employee engagement. Employees' engagement in the safety system and how the system responds to them relates to many of the drivers. Therefore, the formality and effectiveness of this engagement will indicate the magnitude and direction of influence this driver has. As feedback is a large influencer of the continuous improvement efforts, promotion and encouragement will positively influence both of these drivers.

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Chapter 4. Measuring Safety Culture

This chapter provides guidance on how to use current research methods and SMS programs to gather data pertaining to an operator's safety culture.

There is no one clearly defined method to measure safety culture. Rather, safety culture can be assessed using a variety of tools and measurements such as described in 4-1 below.

It's important to note that every aviation organization's safety culture is unique. Additionally, the number of measurement tools in use doesn't equate to a good or bad safety culture and will vary as the organization matures and is exposed to ambient influences. An operator should deploy the most effective tools and target the most appropriate drivers based on their particular operational safety goals and constantly evaluate and adjust those tools.

Modern aviation safety is inseparable from concepts in SMS. Many aviation organizations will already possess programs in their SMS toolkit that personnel use regularly to assess and infer an operator's relative safety. Following tenants of SMS (14 CFR, Part 5), safety programs singularly look at specifics that must be reviewed in totality to comment with any confidence on safety. These same programs can be used to gauge safety culture as well, by not only collecting data with the specific intent of measuring culture, but by examine existing data sources to identify leading and lagging indicators change within a cultural attribute.

To do so, we must acknowledge some important points:

- Every organization has a unique safety culture that is not static
    - It is important to understand how the influence of corporate culture, resource levels, employee/union relations, financial health, and numerous other stimuli may affect safety programs and safety culture.
- Context matters
    - It is difficult to view a safety culture from the outside, one must be in a culture to credibly recognize and/or weigh these factors in safety data such as experience of personnel, changes to environment or procedures, etc. For example, an increase in Aviation Safety Action Program (ASAP) reports from airport operations could be due to restructured ramp positions or employee "buy in" after deployment of new safety training. The safety variables must be analyzed with local understanding.
- Each organization's "positive safety culture" differs
    - Taking into account an organization's unique cultural strengths and weaknesses, one must envision what positive, or negative, safety culture changes would look like in specific safety programs if the indices were to move.
- Recognize current aviation programs or training were influenced by safety culture
    - For example, the behaviors in Crew Resource Management (CRM) and Threat & Error Management (TEM) that are evaluated in simulator training today evolved culturally because airline organizations started looking for certain behaviors and outcomes on the flight deck.

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4-1. Relating Safety Programs to Safety Culture

The following discussion will look at potential safety culture implications in some common safety programs.

Surveys

- Surveys are a familiar tool associated with measuring safety culture. Surveys can be helpful, but awareness of their limitations is critical. Sampling bias, question validity and reliability, respondent interpretation error and misrepresentation error, etc. all present challenges to valid data collection. However, a well-designed survey can be an invaluable and informative data collection method on perceptions of safety culture.

Reporting

Reporting has several ways to inform safety culture within the proper context, as mentioned above.

- Volume of reporting can be informative. One would expect reporting in general to be higher in a positive safety culture versus a negative one due to the implied psychological security.
- While all reporting reactive or proactive is valuable, changing ratios of reporting may be instructive. If an operator's ratio of incident reports versus hazard reports were to change with hazard reports increasing, it may mean that safety ownership has increased, and personnel are engaging more.
- The use of various reporting programs may be an indicator of shifting safety culture when distribution ratios across platforms change, or silos in reporting emerge. For example, if safety and hazard reporting in company programs goes down while ASAP goes up, that could mean personnel are gravitating to the immunity of the ASAP due to a negative shift in the safety culture

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Investigations

- An operator's focus of attention in investigations can reflect on that culture's application of the positive safety culture. For example, is the investigation focused on the who of the incident or the why of the incident? As safety culture improves, one would expect investigations to be focused on quality root cause, continuous improvement, just culture, input from stakeholders, effective mitigations, etc. versus being primarily focused on who made the error.

- The degree of transparency and communication of investigation results could also be considered a measure of safety culture.

Safety Assurance

- Safety assurance looks at operational safety drift and the effectiveness of mitigations/improvements. While there are many factors to consider, uptake or resistance of new policies and the impact on safety performance can be related to cultural factors. Compliance, conformance and the effectiveness of current policies, procedures and training is valuable information to consider as part of safety assurance.

Engagement

- In simple terms, employee engagement means that workers are committed to the organization and its objectives. Engaged employees feel connected to their employer, are highly motivated, and put forth their best effort at work.

- With respect to employee engagement with safety, engagement involves employees who have a clear understanding of the organization's safety objectives and are personally invested in achieving those outcomes.[2] Reporting is an example of engagement, not just the number of reports, but the sentiment of the reports, and the number of people making the reports. The drivers of policy changes, whether or not they are proactive based on employee feedback or as a result of a failure. Another measure, peer to peer discussion/correction is an example of engagement, where employees have a high level of trust and attention toward each other's wellbeing.

Safety Promotion

- The FAA indicates that safety promotion, "[i]ncludes training, communication, and other actions to create a positive safety culture within all levels of the workforce."[3] A measure can be the amount of safety promotion being integrated into all messaging vice stand-

[2] Safety Engagement: How to Engage Employees with Safety (perillon.com)
[3] Safety Management System Components, Safety Management System | Federal Aviation Administration (faa.gov)

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alone only. Is safety promotion prominent in training, communications, meetings and other?

Audits or Evaluations

- Internal evaluation programs (IEP) provide insight through inspections, audits, evaluations, assessments on the adequacy of managerial controls, processes in critical safety systems and other, including corrective action programs. An organization's commitment and use of IEP can provide information relative to its safety culture from a perspective of both the deployment and effectiveness of the IEP and the actual findings and follow-up within the organization.

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Chapter 5. Interpreting Safety Culture Measurements

This chapter reviews and expands on the measurement tools described in Chapter 4. The intent of this chapter is to provide considerations for the interpretation of safety culture measurements.

5-1. Interpreting Safety Culture Measurement (Tools & Results)

As indicated in Chapter 4, there is no single set of measurement tools available to assess the state of an airline's safety culture. Airlines may employ all, some, none, or more than the measurements and considerations listed here and in Chapter 4 and to various degrees. However, it is important to note that the deployment or use of measurement tools does not indicate the state of an airline's safety culture but more so to the degree to which the airline attempts to measure it.

And, while airlines may use similar tools as their industry counterparts, due to the variability of tools, application, distribution and other, there are limits on the ability to draw comparisons from airline to airline or airline to other aviation organizations specifically from these tools.

Surveys

- As mentioned in Chapter 4, surveys are a familiar and often used tool to attempt to assess safety culture within an aviation organization. Considerations for the use of surveys includes, but is not limited to:
    - Sample size and understanding the populations represented within the sample.
    - Timing and events occurring during the survey.
    - The general attitude of respondents to surveys (i.e., the number of various surveys the organization issues, the follow up and response to previous surveys, if applicable, the union support of surveys, the ease of access and use of the survey, etc.)

Employee Reporting

- As illustrated in the previous chapter, the volume of reports received can be informative, however, is not necessarily indicative of a positive or negative safety culture. For example, reports going down may indicate the mitigation of a particular concern, while reports going up may show increased employee engagement due to Safety Promotions. A robust employee reporting program is an important part of an aviation organization's safety culture. Items to consider when evaluating employee reporting include, but are not limited to:
    - The ease at which employees can report safety concerns.

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- The degree to which the organization offers non-punitive reporting options for employees (see Just Culture in 5-2-1).
- Evaluation of the general employee sentiment associated with reporting (both from a frontline and management perspective).
- The level of recognition provided for reporting, including near misses.
- The amount of training provided to employees, including management responders/investigators on their roles related to reporting.

Investigations

- Chapter 4 describes how an aviation organization's emphasis on the investigation process (of accidents or incidents) can provide insight into its safety culture. Some considerations of investigations include:
  - The amount of training provided to investigators and their level of influence in the field (during the investigation)
  - The level of root cause analysis
  - Effectiveness of mitigations and focus on continuous improvement
  - The level of involvement from various levels of the organization (from the Accountable Executive. to the front-line employee, as applicable)

Safety Assurance

- The FAA provides the following regarding safety assurance: "Evaluates the continued effectiveness of implemented risk control strategies; supports the identification of new hazards."[4] It is reasonable that both the degree of implementation/maturity and the outputs of safety assurance can provide information regarding an airline's safety culture. Considerations can include:
  - The scope of data/activities included in safety assurance
    - The quality and quantity of data evaluated in the safety assurance process
  - The level and type of assessment/analysis of acquired safety assurance data
  - The actions, controls and/or mitigations instituted as a result of safety assurance activity

[4] Safety Management System Components, Safety Management System | Federal Aviation Administration (faa.gov)

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Employee Engagement

- As discussed in Chapter 4, employee engagement refers to the level of commitment individuals within the organization have towards safety. General considerations include:
    - The demonstrated level of top leadership support (i.e., Senior Leadership engagement).
    - An environment that promotes information sharing.
    - The importance of Just Culture[5] within the organization.
    - The degree of frontline employee and management participation in safety reporting.
    - The level of involvement of frontline employees in safety committees and development of safety recommendations.

Safety Promotion

- The FAA describes safety promotion[6] as a method to, "ensure employees have a solid foundation regarding their safety responsibilities, the organization's safety policies and expectations, reporting procedures, and a familiarity with risk controls." General considerations include:
    - The level and frequency of safety promotions.
    - The accessibility of the aviation organization's safety policy.
    - The degree to which real life safety examples are utilized as learning opportunities.
    - The level of readership or participation in reviewing safety promotions.
    - The completion rate, and on-time rate of periodic training.
    - The review cycle of the training content.
    - Supervisors receive a commensurate amount of safety training as compared to frontline employees.
    - The content of the training is refreshed and tailored to the manager.

[5] Just Culture Definition, "An atmosphere of trust in which people are encouraged (even rewarded) for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior.", Reprinted by permission from the Global Aviation Information Network, as found at https://flightsafety.org/files/just_culture.pdf

[6] FAA Advisory Circular 120-92B, Section 2.2.e

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Audits and Evaluations

- An aviation organization's IEP, which provides independent review of company policies, procedures and systems can provide insight into the organization's safety culture in specific locations and provide information on safety trends for the organization as a whole. General considerations include:
    - To what extent does your IEP team have safety training?
    - What level of engagement does your IEP have in assessing safety culture influencers discussed in this section?
    - What is the depth and frequency of safety reporting provided by the IEP to upper management within the organization?

Additional Areas of Consideration

- Recognition and Motivation
    - The degree to which the organization motivates employees to participate in the safety process and recognizes activities within the safety programs. General considerations include:
        - The amount, type or frequency of recognition of employee and/or organizational safety results.
        - The types of motivation and recognition for employees participating in the safety reporting process.
- Prioritization of Safety within the Organization
    - A common theme within the aviation industry is the need to balance and manage safety (protection) with the organization's production, performance, or other goals. The organization can recognize, communicate and demonstrate that safety policies and guidelines should never be circumvented in the name of service (production/performance). General considerations include:
        - Consistent messaging from leaders identifying the priority of safety.
        - Transparency and education on any perceived conflicts between safety and production.
        - Determination if management leads by example.
        - The level and frequency of communication empowering employees to call a safety timeout.

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        - The degree to which the organization addresses any misperceptions that safety is slow or more costly.

- Accountability
    - In this context, accountability speaks to the organization's level of tolerance to a lack of adherence to safety policies or guidelines. General considerations include:
        - To what degree is performance rewarded over safety? If performance is achieved through "heroic acts" which required deviation from normal safety standards, is that rewarded or corrected?
        - To what level are all employees educated and held responsible for reporting unsafe acts?
        - The amount of reinforcement for positive safety behaviors.
        - What is the level of Just Culture within the organization?
- Safety Ownership
    - Safety ownership is generally understood to mean the level of understanding of how an employee's performance of safety related duties and activities contributes to the overall safety of the airline. General considerations include:
        - The level of acceptance and recognition that safety is everyone's role, not someone else's (i.e. the Safety Department).
        - The degree to which employees arrive to work physically and mentally prepared to do their jobs.
        - Employees' ability to recognize and manage distractions.
        - The level at which personnel identify and report hazards in the operations.
        - The degree to which employees comply with company, regulatory and safety procedures and policies.

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Chapter 6. Summary

As described in this document, safety culture is a subset of an organization's overall culture and is the resultant characteristics and behaviors of an organization with respect to operational risk management.

There are many factors described in Chapter 3 that can drive a safety culture. They include Frontline Management Commitment, Senior Management Commitment, Co-worker Commitment, Personal Commitment, Safety Awareness, Communications, Policies/Procedures/Training, Continuous Improvement/Learning Organization and Reporting/Feedback.

Safety culture can be assessed using a variety of tools and measurements, most notably, Surveys, Employee Reporting, Investigations, Safety Assurance, Employee Engagement, Safety Promotions and Audits & Evaluations. Safety Performance indicators can be derived and tailored for your organization from these measurements.

It's important to note that every aviation organization's safety culture is unique. Additionally, the number of measurement tools in use doesn't equate to a good or bad safety culture and will vary as the organization matures and is exposed to ambient influences. An operator should deploy the most effective tools and target the most appropriate drivers based on their particular operational safety goals and constantly evaluate and adjust those tools.

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Appendix A. Ideas for later consideration

Listed below are a few ideas or concepts that could be given further attention in future safety culture guidance efforts:

- Collaboration and sharing between aviation organizations on ideas, concepts, tools, such as:
  - The types of questions to use in safety culture surveys.
  - Best methods to engage employees in safety culture.
  - Best practices for implementing tools for measuring or enhancing safety culture.
- Recognize, communicate and educate on the impacts/affects of decisions made by non-operational personnel within the airlines (e.g., Network/Revenue Management, Finance, Human Resources, Fleet Procurement, etc.).
- Aviation organization safety culture interfaces, integration and influences on and from other participants or systems in the aviation industry ecosystem (e.g., airports, ATC, artificial intelligence, cyber security, etc.)
- Further research on the practicality, considerations and limitations of using certain data collection tools, such as, surveys, in-depth interviews, focus groups, etc.

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Appendix B. Resources and Reading

Books

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