Safety Management System Inspector Competency Guidance

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1. Introduction

Aviation regulator workforces include highly skilled positions with significant technical and educational requirements. As Safety Management System (SMS) implementation progresses, it will become necessary for regulators to define SMS-related competencies for their inspector workforce, which will ensure that personnel requirements are aligned with the SMS and employees have the requisite skills and knowledge to perform SMS oversight effectively.

This document provides core SMS competencies for inspectors tasked with accomplishing oversight activities, as recommended by the Safety Management International Collaboration Group (SM ICG) and the guidance used to develop these competencies and behaviors that demonstrate proficiency. It does not establish metrics for performance standards. Although this document only provides competencies for inspectors, the framework provided can be used to develop other position competencies as needed by a regulator.

Although this document focuses on competencies related to SMS, regulators should also consider how these competencies fit into their overall authority level competencies. It is not recommended or intended for regulators to have multiple sets of competencies that could be inconsistent or divergent from each other.

2. What Is a Competency?

A competency is:

> "A capability that allows a person to perform various processes or tasks and achieve outcomes. It is a combination of relevant knowledge, skills, and attitudes. It is the demonstrated ability to apply knowledge and skills."

In essence, competencies are the integrated knowledge, skills, judgment, and attributes that people need to perform a job effectively. By having a defined set of competencies for each role, the organization shows employees the kind of behaviors it values and those it requires to help achieve its objectives.

A competency framework is a structure that identifies and defines each individual competency required to work in an organization or part of an organization. Competency frameworks are normally structured by subject areas and roles in an organization.

3. Why Do We Need Competencies?

Defining which SMS-related competencies are necessary for success can help regulators to:

- Recruit and select new staff more effectively;
- Ensure that employees demonstrate sufficient expertise;
- Evaluate performance more effectively;
- Identify skill and competency gaps more efficiently;
- Provide more customized training and professional development; and
- Plan for succession.

Using a competency framework, regulators can define the set of practices needed for effective inspection and oversight of an SMS. By collecting and combining competency information, they can create a standardized approach to inspection that is clear and accessible to everyone in the

organization. The framework is designed to outline specifically what inspectors need to do to be effective in their SMS-related roles, and to clearly establish how their roles relate to effective inspection and oversight. The competencies can be used as a basis for developing and delivering needed training to inspectors.

Meeting Organizational Goals

As SMS implementation progresses, regulators will need to identify SMS-related goals, establish corresponding competencies, and assess the skills of their current workforce against those competencies to identify any gaps that need to be filled.

4. Recommended SMS Competencies

The recommended SMS-related competencies identified in this section are those developed and agreed by the SM ICG and may be used as a starting point for developing inspector competencies. Each regulator may have other competencies it expects its inspectors to possess. This is intended to be a common set needed for SMS oversight and evaluation. These competencies were developed using the strategy defined in Sections 5 and 6 of this document. It is recommended that any regulator reviews the methodology before wholly accepting these as applicable to its organization.

Core SMS Competencies

Regulators may choose to create competencies with more specifics about how the safety management knowledge, skills, and attributes apply to the organization's core mission. These are the core competencies recommended by the SM ICG:

- Working understanding of management systems to be able to evaluate how an organization ensures compliance with regulatory requirements on an on-going basis.
- Understanding the regulatory framework and its intent to ensure an organization meets the requirements for its certificates.
- Understanding of SMS oversight techniques.
- Understanding how organizational safety performance framework and indicators are developed and used in a management system.
- Understanding of the different types of cultures found in an organization and how they can affect the system performance.
- Understanding sensitivity of confidential issues to prevent inadvertent disclosure of specific organizational data by the regulator.
- Communication skills necessary to interface effectively between industry and internal stakeholders.
- Analytical skills commensurate with roles and responsibilities to assess the organizations safety performance.
- Decision making skills necessary to exercise judgment based on all available information.

- Open-mindedness: To be able to accept new ideas or different viewpoints including being able to recognize that a management system is proportionate to the size and complexity of the organization.
- Systems thinking: The ability to recognize the components of a system and how they interact and interface.
- Assertiveness: The quality of being able to confidently and vigorously state and defend one's opinion.
- Teamwork: SMS assessment is often carried out as part of a team so there is a need to be able to work in a multi-disciplinary environment in a cooperative manner.
- Appreciation of the subjectivity of safety management and the need to establish objective evidence where possible.
- Understanding of human performance and limitations and understanding of the organizational factors that may influence these.
- Understanding risk to evaluate issues or proposed changes and the impact on the organization and the aviation system; and to evaluate the need for safety risk controls.

Competency Categorization: Using Subgroups

As described further in Section 5, competencies may have varying degrees of detail. In creating a competency framework for SMS, regulators may wish to group competencies into high-level groups and subgroups. To illustrate this idea, Table 1 shows SMS Core competencies, including a subgroup of competencies with greater detail.

Table 1: Core Competency Group and Subgroup

SMS Core Competency	Competency Subgroup
1. **Working understanding of management systems** to be able to evaluate how an organization ensures compliance with regulatory requirements on an on-going basis	▪ Understands the role of the accountable manager (See SM ICG pamphlet, *The Senior Manager's Role in SMS*). ▪ Understanding of basic components of a management system. ▪ Understands the need for management system components to be integrated and operate as one system. ▪ Recognizes whether management systems are appropriate for the type, size and operating environment of the organization. ▪ Understanding of change management principles. ▪ Understanding of best practices for continuous improvement.

SMS Core Competency	Competency Subgroup
2. **Understanding the regulatory framework and its intent** to ensure an organization meets the requirements for its certificates	▪ Understanding of legislation and regulations (international/national). ▪ Understanding of background/intent of legislation and regulations. ▪ Understanding of acceptable means of compliance. ▪ Understanding of state policies such as enforcement policies. ▪ Ability to evaluate the acceptability of implementation of an organization with regard to legislation and regulations. ▪ Ability to assist an organization in the interpretation of applicable regulatory requirements.
3. **Understanding of SMS oversight techniques**	▪ Training and demonstrated experience in regulatory surveillance activities. ▪ Ability to plan, conduct and debrief compliance-based audits and inspections. ▪ Ability to identify significant safety deficiencies in a system. ▪ Ability to include performance-based elements in routine oversight activities. ▪ Understanding difference between compliance- and performance-based oversight.
4. **Understanding how organizational safety performance framework and indicators are developed and used in a management system**	▪ Understands different types of indicators and their use and needs. ▪ Differentiates between effective and ineffective indicators. Effective indicators are those that are directly related to performance goals, while ineffective ones do not tell the inspector much about the performance. ▪ Understands how data is collected and analyzed in the organization ▪ Ability to evaluate effectiveness of indicators and review as necessary. ▪ Knowledge of target setting and its limitations. ▪ Awareness of best practices with measuring performance in the same aviation sector. ▪ Awareness of major risk areas/concerns at the national/regional level and how the organization may contribute to them. ▪ Ability to translate the information obtained from the safety performance into messages that are suitable for various audiences (e.g., accountable executive, national safety teams, staff). ▪ Familiar with State safety performance Indicators and expectations of how organizations are expected to consider them.
5. **Understanding of the different types of cultures found in an organization** and how they can affect the system performance	▪ Recognizes different types of national, ethnic, and professional cultures and how they may affect the safety culture of an organization. ▪ Recognizes different types of organizational culture and their impact on personnel at various levels of the organization. ▪ Ability to assess whether, and to what extent, a just culture exists within an organization. ▪ Ability to assess whether, and to what extent, a safety culture exists in an organization.
6. **Understanding sensitivity of confidential issues** to prevent inadvertent disclosure of safety data by the regulator	▪ Understands legislation and regulations regarding data disclosure and protection. ▪ Recognizes the importance of an open reporting environment and its impact on the effectiveness of a management system. ▪ Understands the limitations on the use of safety information and the potential impact of data release or inappropriate usage including inadvertent disclosure. ▪ Understands the sensitivity of dealing with an organization's confidential reporting system/just culture and the damage that a regulator could have on that system/culture.

SMS Core Competency	Competency Subgroup
7. **Communication skills** necessary to interface effectively between industry and internal stakeholders	▪ Highly developed written communication skills including the ability to write detailed technical reports. ▪ Experience and ability to communicate effectively in a complex technical environment. ▪ Demonstrates a high level of interpersonal, oral, and written communication skills, including the ability to liaise effectively at a senior level and influence outcomes both internally and with external organizations. ▪ Demonstrate sound interviewing skills such as being an active listener, speaking clearly, and being able to articulate thoughts and formulate questions appropriately. ▪ Ability to adequately manage conflict and confrontation in a work environment.
8. **Systems thinking:** The ability to recognize the components of a system and how they interact and interface	▪ Ability to identify indicators of a systemic failure in addition to indications of a single point failure. ▪ Experience and ability to understand a complex technical operating environment. ▪ Demonstrate clear understanding and application of accident causality models. ▪ Understanding of the potential impact of interactions (both positive and negative) between systems and at interfaces within a system (e.g., Quality Management Systems (QMS), maintenance control systems, error management systems, Air Traffic Control (ATC) systems).
9. **Analytical skills commensurate with roles and responsibilities** to assess the organizations safety performance	▪ Ability to verify that the organization data collection processes capture appropriate information. ▪ Ability to verify the effectiveness of the risk analysis process. ▪ Ability to use causal analysis methods. ▪ Ability to evaluate trends in safety and compliance issues. ▪ Ability to assess the service provider's safety accomplishments compared with its safety performance objectives. ▪ Ability to understand the limitations of data and how it can be used in analyzing safety performance.
10. **Decision making skills** necessary to exercise judgment based on all available information	▪ Ability to critically and accurately analyze trends, problem situations, and issues. ▪ Ability to use logic and analysis to arrive at appropriate conclusions from relevant information and assumptions. ▪ Ability to infer, categorize, organize, and connect related concepts. ▪ Ability to exercise judgment, intelligence, and discretion in making decisions. ▪ Skills that can help identify decision alternatives. ▪ Ability to envision possible future consequences of alternative solutions. ▪ Ability to collaborate, communicate, cooperate, learn, negotiate, and listen to ensure effective group decision making. ▪ Skilled in managing emotions and perception issues to ensure objectivity in stressful decision situations. ▪ Ability to discern what factors contribute to a situation allowing for focusing on appropriate solution.
11. **Open-mindedness:** To be able to accept new ideas or different viewpoints including being able to recognize that a management system is proportionate to the size and complexity of the organization	▪ Ability to assess whether a management system is appropriate to the operations of the organization. ▪ Understanding of the criteria for differentiating the size and complexity of each organization, taking into account its type(s) of certificate(s). ▪ Skilled in recognizing that different processes and procedures may lead to the same result. ▪ Ability to listen to and understand what the organization performs to achieve an effective management system.

SMS Core Competency	Competency Subgroup
12. **Assertiveness:** The quality of being able to confidently and vigorously state and defend one's opinion	▪ Rigorous and tenacious in finding proof or objective evidence. ▪ Ability to state opinions firmly without either aggressively threatening or submissively accepting the opinions of others.
13. **Teamwork:** SMS assessment is often carried out as part of a team so there is a need to be able to work in a multi-disciplinary environment in a cooperative manner	▪ Ability to collaborate and cooperate to achieve a common goal. ▪ Ability to employ cooperative behavior to resolve interpersonal problems and optimize member interaction. ▪ Ability to build trust and respect among team members. ▪ Ability to receive and offer constructive feedback to other team members. ▪ Ability to work with specialists from other technical disciplines.
14. **Appreciation** of the subjectivity of safety management systems and the need to establish objective evidence where possible	▪ Ability to recognize and mitigate personal biases and emotional involvement when conducting inspections. ▪ Ability to justify and document major decisions based on observable signals. ▪ Ability to apply subjective judgments where necessary and to establish objective evidence where possible.
15. **Understanding of human performance and limitations** and understanding of the organizational factors that may influence these	▪ Understanding of human factors and human performance limitations to be able to recognise weak risk mitigations, processes, and procedures that are open to human errors. ▪ Ability to analyze incidents/events using human factors models (e.g., SHELL, HFACS). ▪ Ability to identify and articulate the effects of organizational culture on operational safety. ▪ Ability to identify human factor related risks within an organisation's SMS.
16. **Understanding risk** to evaluate issues or proposed changes and the impact on the organization and the aviation system; and to evaluate the need for safety risk controls	▪ Understanding of the relationships between hazards and their consequences and how they contribute to accidents and incidents. ▪ Ability to identify the precursors to safety issues. ▪ Ability to assess factors contributing to risk, and evaluate the effectiveness of implemented mitigation strategies. ▪ Ability to share data and work cooperatively to determine risks. ▪ Ability to recognize technical issues that may have safety-critical implications.

Levels of Proficiency

While basic SMS competencies may be necessary for all safety professionals, the level of expertise will vary among individuals. It may also be necessary to define additional proficiency levels for each competency based on job function and safety professional roles. Figure 1 is an example of SMS competencies for an SMS Inspector at various levels. It assumes both phased SMS implementation on the part of the product/service provider and phased approvals on the part of the oversight organization.

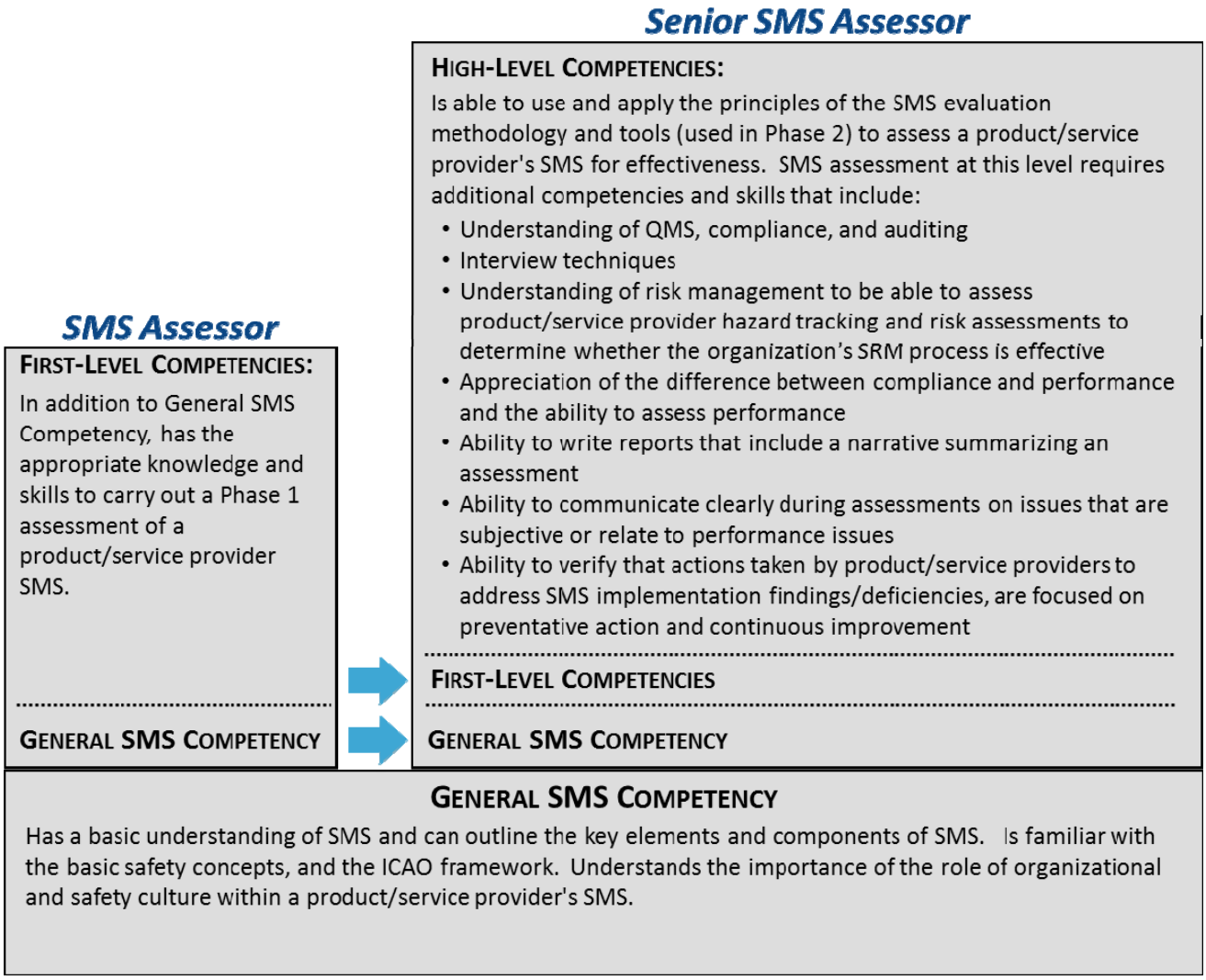

Figure 1: Example of Competency Levels[1]

Additional levels of proficiency could be defined for SMS focal leads, trainers, program managers, and other relevant roles.

[1] Adapted from draft Safety Management Competencies from the Civil Aviation Authority of United Kingdom (UK CAA).

5. How to Develop a Competency Framework

A competency framework defines the knowledge, skills, and attributes needed for various roles within an organization. Each individual role will have its own set of competencies needed to perform the job effectively. To develop SMS-related competencies, there needs to be an in-depth understanding of the roles within the organization. To create a competency framework, regulators can:

- Use a pre-set list of common, standard competencies, and then customize it to the specific needs of the organization.
- Create a general organizational framework, and use it as the structure for developing competencies.

Developing a competency framework can be a considerable effort. To make sure the framework is actually used as needed, it is important to make it relevant to the people who will be using it. Figure 2 illustrates the four main steps used/required to develop a competency framework: preparation, information gathering, categorization, and validation. Each step contains key actions that will encourage people to accept and use the final product.

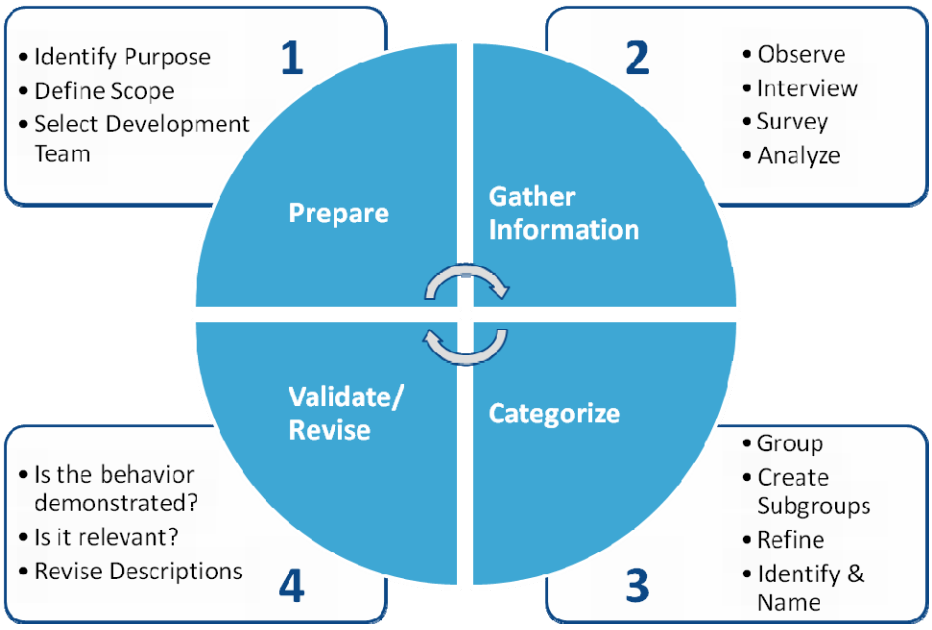

Figure 2: Competency Framework Development Steps

Prepare

Before starting to analyze positions and determine what each needs for success, it is important to look at the purpose of creating the SMS-related competencies. How the organization plans to use them will determine the scope of the effort and the composition of the development team. For example, a framework for filling a job vacancy will be very specific, whereas a framework for evaluating organizational staffing for a new project will need to cover a wide range of roles.

When composing a competency development team, include people from all areas of the organization that will use the competency framework. As far as possible, aim to represent the diversity of the organization. It is also important to think about long-term needs, so that the framework can remain updated and relevant.

Gather Information

Generally, the better the data collected, the more accurate the competency framework will be. For this reason, it is a good idea to consider which techniques to use to collect information about the roles and the work involved in each one. In order to determine current roles and the SMS-related skills needed, the regulator may want to use the following:

- **Observe** – Watch people while they perform their roles within an organization.
- **Interview people** – Talk to every person individually, choose a sample of people to interview, or conduct a group interview. It is also helpful to interview the supervisor of the job being assessed, which will give an understanding of what a wide variety of people believe is needed for the role's success.
- **Create a questionnaire** – A survey is an efficient way to gather data. Spend time making sure to ask the right questions and consider the issues of reliability and validity. If preferred, an organization may choose to purchase off-the-shelf, standardized job analysis questionnaires, rather than attempting to create them.
- **Analyze the work** – Determine which behaviors are used to perform the jobs covered by the competency framework. Job analyses that include a variety of techniques and considerations will produce the most comprehensive and accurate results. If creating a framework for the entire organization, make sure to use a sample of roles from across the organization. This will help capture the widest range of competencies that are still relevant to the whole organization.

  Consider the following:
  - Plans, strategies, and objectives,
  - Organizational principles,
  - Job descriptions,
  - Regulatory issues, and
  - Predictions for the future of the organization or industry.

The next step of competency development involves organizing the information into larger competencies, so it helps to analyze and group raw data effectively.

Divide Into Categories

This stage involves grouping all of the behaviors and skill sets into competencies. Follow these steps to help with this task:

- **Group the statements** – Ask competency development team members to read through the behavior statements, and group them into piles. The goal is to have three or four piles at first – for instance: technical skills, decision-making and judgment skills, and interpersonal skills.
- **Create subgroups** – Break down each of the larger piles into subcategories of related behaviors. Typically, there will be three or four subgroups for each larger category. This provides the basic structure of the competency framework.
- **Refine the subgroups** – For each of the larger categories, define the subgroups even further. Ask why and how the behaviors relate to one another (or not), and revise the groups as necessary.

- **Identify and name the competencies** – Have the team identify a specific competency to represent each of the smaller subgroups of behaviors. Then name the larger categories.

Table 2 shows an example of group and subgroup categorization for general management competencies.

Table 2: Example of Competency Categorization

General Management			
Supervising & Leading Teams	▪ Provide ongoing direction and support to staff; ▪ Take initiative to provide direction; ▪ Communicate direction to staff; ▪ Monitor performance of staff; ▪ Motivate staff; ▪ Develop succession plan; and ▪ Ensure that organizational standards are met.	**Training Development**	▪ Deliver training to junior staff; ▪ Deliver training to senior staff; ▪ Identify training needs; ▪ Support personal development; and ▪ Develop training materials and methodology.

Validate/Revise the Competencies

Validate and revise the competencies as necessary. For each item, ask these questions:

- Is this behavior demonstrated by the people who perform the work most effectively? In other words, are people who do not demonstrate this behavior less effective than those who do?
- Is this behavior relevant and necessary for effective work performance?

These questions are often asked in the form of a survey. It is important to look for consensus among the people doing the job, as well as areas where there is little agreement. Also, look for possible issues with language, or the way the competencies are described, and refine those as well.

6. Tips for Competency Development

Regulators should keep the following three principles in mind when developing competencies:

1. **Involve the people doing the work** – These competency frameworks should not be developed solely by human resources staff, who may not always know what each job actually involves. Nor should they be created solely by managers, who may not always understand exactly what each member of their staff does every day. To understand a role fully, one must go to the source – the person doing the job – as well as getting a variety of other inputs into what makes someone successful in that job. For SMS-related competencies, it is equally important to consult subject matter experts, as they are the people developing the safety management processes that inspectors will be expected to use.

2. **Communicate** – People can get nervous about performance issues. Let them know why your organization is developing SMS-related competencies, how they will be created, and how the organization plans to use them. The more the organization communicates in advance, the easier implementation will be.

3. **Use relevant competencies** – Ensure that the competencies being included apply to all roles covered by the framework: people may have a hard time relating to it if irrelevant competencies are included. For example, if the goal is to create a framework to cover the whole organization, then financial management would not be included unless every worker had to demonstrate that skill. However, a framework that covers management roles would almost certainly involve the financial management competency.

7. Implementation

As regulators finalize competencies, communication is vital. To help get buy-in from employees at all levels of the organization, it is important to explain why the competencies have been developed, how they will be used, and the process that will be used to update them.

This paper was prepared by the Documentation Workgroup of the Safety Management International Collaboration Group (SM ICG). The purpose of the SM ICG is to promote a common understanding of Safety Management System (SMS)/State Safety Program (SSP) principles and requirements, facilitating their application across the international aviation community.

The current core membership of the SM ICG includes the Aviation Safety and Security Agency (AESA) of Spain, the National Civil Aviation Agency (ANAC) of Brazil, the Civil Aviation Authority of the Netherlands (CAA NL), the Civil Aviation Authority of New Zealand (CAA NZ), the Civil Aviation Safety Authority (CASA) of Australia, the Direction Générale de l'Aviation Civile (DGAC) of France, the European Aviation Safety Agency (EASA), the Federal Office of Civil Aviation (FOCA) of Switzerland, Japan Civil Aviation Bureau (JCAB), the United States Federal Aviation Administration (FAA) Aviation Safety Organization, Transport Canada Civil Aviation (TCCA) and the Civil Aviation Authority of United Kingdom (UK CAA). Additionally, the International Civil Aviation Organization (ICAO) is an observer to this group.

Members of the SM ICG:

- Collaborate on common SMS/SSP topics of interest
- Share lessons learned
- Encourage the progression of a harmonized SMS
- Share products with the aviation community
- Collaborate with international organizations such as ICAO and civil aviation authorities that have implemented or are implementing SMS

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