1. PURPOSE

The purpose of this Advisory Circular (AC) is to provide guidance on the conduct of safety performance monitoring and measurement within an organization.

2. REFERENCES

Civil Aviation (SMS) Regulations
Other related Tanzania Civil Aviation Regulations
ICAO Safety Management Manual (Doc 9859)
ICAO Annexes 1, 6, 8, 11, 13 and 14

3. GUIDANCE INFORMATION

3.1 Regulation 20 (1) of the Civil Aviation (SMS) Regulations requires that a service provider shall, as part of the SMS safety assurance activities, develop and maintain the necessary means to verify the safety performance of the organization in reference to the safety performance indicators and safety performance targets of the SMS.

3.2 The primary task of safety assurance is control. This is achieved through safety performance monitoring and measurement. Safety performance monitoring and measurement is the process by which the safety performance of the organization is verified in comparison with the safety policy and approved safety objectives. Safety assurance control is conducted by monitoring and measuring the outcomes of activities that operational personnel must engage in for the delivery of services by the organization.

3.3 Most assurance activities under safety performance and monitoring are focused on conditions in the workplace that affect how people perform necessary activities for the delivery of services.

3.4 The following provides a list of generic aspects or areas to be considered to “assure safety” through safety performance monitoring and measurement:

a) ***Responsibility.*** Who is accountable for management of the operational activities (planning, organizing, directing, controlling) and its ultimate accomplishment.

b) ***Authority.*** Who can direct, control or change the procedures and who cannot as well as who can make key decisions such as safety risk acceptance decisions.
c) ***Procedures.*** Specified ways to carry out operational activities and that translate the "what" (objectives) into "how" (practical activities).
d) ***Controls.*** Elements of the system, including, hardware, software, special procedures or procedural steps, and supervisory practices designed to keep operational activities on track.
e) ***Interfaces.*** An examination of such things as lines of authority between departments, lines of communication between employees, consistency of procedures, and clear delineation of responsibility between organizations, work units and employees.
f) ***Process measures.*** Means of providing feedback to responsible parties that required actions are taking place, required outputs are being produced and expected outcomes are being achieved.

4. SAFETY PERFORMANCE MONITORING AND MEASUREMENT

4.1 General

Information for safety performance and monitoring comes from a variety of sources (means), including formal auditing and evaluation, investigations of safety-related events, continuous monitoring of day-to-day activities related to the delivery of services, and input from employees through hazard reporting systems. The Safety performance monitoring and measurement means as listed in Regulation 21 (2) of the Civil Aviation (SMS) Regulations shall include-

a) hazard reporting systems;
b) safety audits;
c) safety surveys;
d) safety reviews;
e) safety studies; and
f) internal safety investigations.

4.2 Hazard reporting systems

4.2.1 Hazard reporting systems are essential elements in hazard identification.

There are three types of reporting systems:

a) mandatory reporting systems;
b) voluntary reporting systems; and
c) confidential reporting systems.

4.2.2 In ***mandatory reporting systems***, service providers are required to report certain types of events or hazards. This necessitates detailed procedures outlining who shall report and what shall be reported. Since mandatory systems deal mainly with "hardware" matters, they tend to collect more information on technical failures than on other aspects of operational activities. To help overcome this bias, voluntary reporting systems aim at acquiring more information on those other aspects.

4.2.3 In ***voluntary reporting systems*** the reporter, without any legal or administrative requirement to do so, submits voluntary event or hazard information. In these systems, organizations may offer an incentive to report. The reported information should not be used against the reporters, i.e. such systems must be non-punitive and afford protection to the sources of the information to encourage the reporting of such information.

4.2.4 ***Confidential reporting systems*** aim to protect the identity of the reporter. This is one way of ensuring that voluntary reporting systems are non-punitive. Confidentiality is usually achieved by de-identification, and any identifying information about the reporter is known only to "gatekeepers" in order to allow for follow-up or "fill in voids" in the reported event(s). Confidential incident reporting systems facilitate the disclosure of hazards leading to human error, without fear of retribution or embarrassment, and enable broader acquisition of information on hazards.

4.2.5 While the basic processes underlying reporting systems are standardized, the actual reporting requirements may vary among organizations. It is also important to note, in order to ensure the success of the reporting systems, that there is a normal reluctance by operational personnel to report. This statement is valid for all types of reporting, and particularly applicable where self-reporting of errors is involved. The reasons for this reluctance include retaliation, self-incrimination and embarrassment. Education in terms of the importance of safety reporting in hazard identification systems, and the protection of the sources of safety information are essential strategies to circumvent reluctance to report and to ensure an effective safety reporting environment. Typical qualities of successful safety reporting systems include:

a) the reports are easy to make;
b) there are no disciplinary actions as a result of the reports;
c) the reports are confidential; and

d) feedback is rapid, accessible and informative.

4.3 Safety audits

Audits focus on the integrity of the organization's SMS and periodically assess the status of safety risk controls. Audits are performed at the functional level, allowing for a broad range of complexity, commensurate with the complexity of the organization. While audits are "external" to the units involved in activities directly related to the provision of services, they are still "internal" to the organization as a whole. Audits are not intended to be in-depth audits of the technical processes but rather they are intended to provide assurance of the safety management functions, activities and resources of line units. Audits are used to ensure that the structure of the SMS is sound in terms of staffing, compliance with approved procedures and instructions, levels of competency and training to operate equipment and facilities and maintain required levels of performance, etc.

4.4 Safety surveys

Safety surveys examine particular elements or procedures of a specific operation, such as problem areas or bottlenecks in daily operations, perceptions and opinions of operational personnel and areas of dissent or confusion. Safety surveys may involve the use of checklists, questionnaires and informal confidential interviews. Since surveys are subjective, verification may be needed before corrective action can be taken. Surveys may provide an inexpensive source of significant safety information.

4.5 Safety reviews

4.5.1 Safety reviews are conducted during introduction and deployment of new technologies, change or implementation of procedures, or in situations of a structural change in operations. Safety reviews are a fundamental component of the management of change. They have a clearly defined objective that is linked to the change under consideration. For example, if JNIA is considering implementing airport surface detection equipment (ASDE), the objective of the safety review would be to assess the safety risks associated with implementing an ASDE at JNIA by evaluating the appropriateness and effectiveness of the safety management activities related to the project. Safety reviews are conducted by Safety Action Groups (SAG), which look for effective performance of the following safety management activities under the proposed changes:

a) hazard identification and safety risk assessment/mitigation;
b) safety measurement;
c) management accountabilities;
d) operational personnel skills;
e) technical systems; and
f) abnormal operations.

4.5.2 Once performance of each safety management activity under the proposed changes is reviewed, the SAG produces a list of hazard concerns for each activity, the response/mitigation proposed by the line manager, and an assessment of the appropriateness and effectiveness of the mitigations to address the hazards. The mitigation will be appropriate if it actually addresses the hazard. The mitigation will be effective if it consistently manages the safety risks under normal operating conditions in order to reduce the safety risks to a level as low as reasonably practicable (ALARP). The SAG also proposes a prioritization of the responses/mitigations, by allocating importance and urgency to each hazard. Safety reviews thus ensure safety performance during periods of change, by providing a roadmap to safe and effective change.

4.6 Safety studies

Safety studies are rather large analyses encompassing broad safety concerns. Some pervasive safety issues can best be understood through an examination in the broadest possible context. An organization might experience a safety concern which is of a global nature, and which may have been addressed on an industry- or Statewide scale. For example, an airline may experience an increase in approach and landing related events (unstable approaches, deep landings, landings with excessive airspeed and so forth). At a global level, the industry has been concerned with the frequency and severity of approach and landing accidents (ALA) and has undertaken major studies, produced many safety recommendations and implemented global measures to reduce such events during the critical approach and landing phases of flight. Thus, the airline in question can find in these global recommendations and studies convincing arguments for its own, in-house safety analysis. Such arguments are necessary to achieve large-scale changes requiring significant data, appropriate analysis, and effective communication. Safety arguments based on isolated occurrences and anecdotal information may not be enough. Because of their nature, safety studies are more

appropriate to address system safety deficiencies rather than identify specific, individual hazards.

4.7 Internal safety investigations.

Internal safety investigations include occurrences or events that are not required to be investigated or reported to the State, although in some instances organizations may conduct internal investigations notwithstanding the fact that the event in question is being investigated by the State. Examples of occurrences or events that fall within the scope of internal safety investigations include: in-flight turbulence (flight operations); frequency congestion (ATC); material failure (maintenance), and ramp vehicle operations (aerodrome).

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DIRECTOR SAFETY REGULATION