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Safety Management Basic Concepts

Eddian Méndez

ICAO NACC ATM/SAR Regional Officer

ICAO NACC Regional Office/13 August 2019



Objective

✈ Reaffirm the understanding of the fundamental principles supporting safety management.



SAFETY MANAGEMENT

WHAT IS SAFETY MANAGEMENT?

- ✈ Safety management seeks to proactively mitigate safety risks before they result in aviation accidents and incidents. Through the implementation of safety management, States can manage their safety activities in a more disciplined, integrative and focused manner.
- ✈ Possessing a clear understanding of its role and contribution to safe operations enables a State, and its aviation industry, to prioritize actions to address safety risks and more effectively manage its resources for the optimal benefit of aviation safety.
- ✈ The effectiveness of a State's safety management activities is strengthened when implemented in a formal and institutionalized way through a State safety programme (SSP) and through safety management systems (SMSs) for its service providers. A State's safety programme, combined with the SMSs of its service providers, systematically addresses safety risks, improves the safety performance of each service provider, and collectively, improves the State's safety performance.



SMS Reconsidered

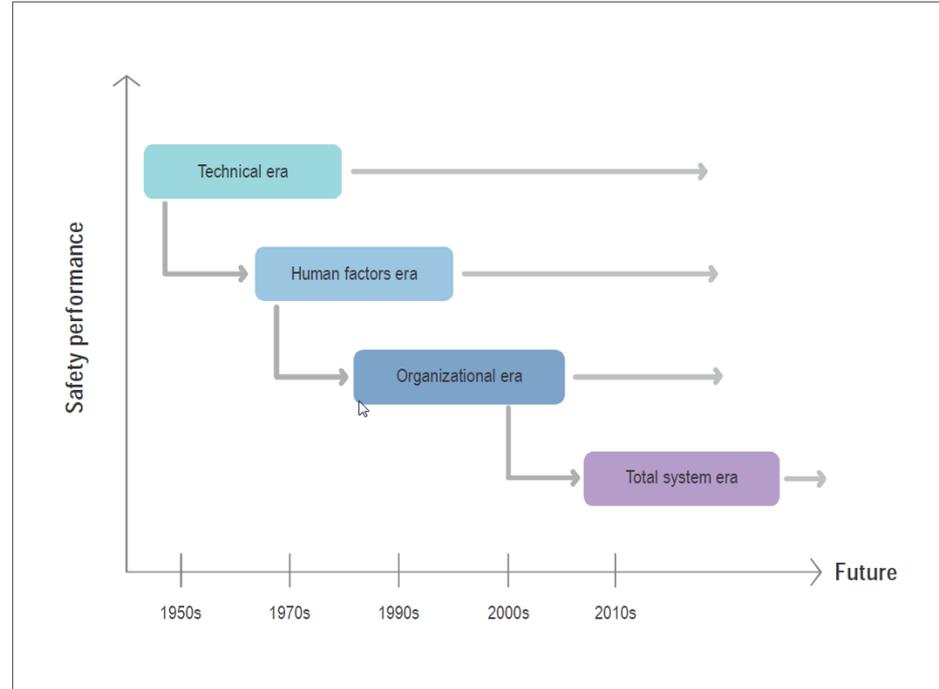
by William R. Voss | May 17, 2012

- ✈ SMS was meant to do one simple thing — allocate resources against risk.
 - ✈ Go back to last year's budget, and see if you can find one single instance where information from your SMS caused you to spend money differently than you had planned. If you cannot find an example of that in your operation, you either have an extraordinarily brilliant budgeting process, or an SMS that is not delivering.
- ✈ Four simple questions, that are really easy to answer if you have an effective SMS, and impossible to answer if you don't:
 - ✈ What is most likely to be the cause of your next accident or serious incident?
 - ✈ How do you know that?
 - ✈ What are you doing about it?
 - ✈ Is it working?



SAFETY

- ✈ Within the context of aviation, safety is “the state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level”.
- ✈ Aviation safety is dynamic. New safety hazards and risks continuously emerge and must be mitigated. As long as safety risks are kept under an appropriate level of control, a system as open and dynamic as aviation can still be kept safe.
 - ✈ It is important to note that acceptable safety performance is often defined and influenced by domestic and international norms and culture.





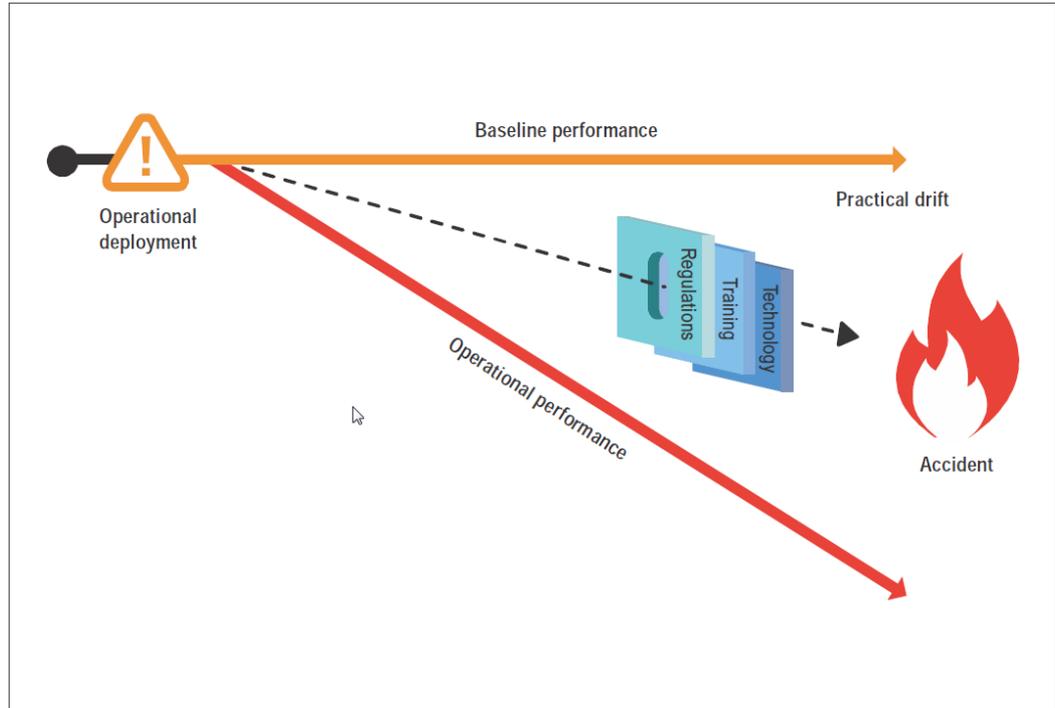
SAFETY MANAGEMENT APPLICABILITY

- ✦ Total system safety approach
 - ✦ A total system safety approach considers the entire aviation industry as a system. All service providers, and their systems for the management of safety, are considered as sub-systems. This allows a State to consider the interactions, and cause and effect, throughout the whole system.
- ✦ Subcontracting implications
 - ✦ For Safety Risk Management (SRM) to be effective across service providers it is important to clearly define the responsibilities for the identification of hazards and management of associated safety risks for the entire chain of services within the system, without gaps or overlaps. Where a service provider with an SMS requirement contracts to an organization not subject to SMS, the hazards and safety risks potentially introduced by the contractor are addressed by the SMS of the service provider. This places additional SRM responsibilities on the service provider to ensure they are knowledgeable about the safety risks induced by the activities of their contractor(s).
- ✦ Safety risk control through regulations
 - ✦ States should assess whether the existing legislation and regulations effectively address the hazards entailed by the activity. It could be that existing requirements provide sufficient safety risk mitigation and imposing a requirement for SMS for those organizations not applicable under Annex 19 may not yield substantial safety benefit.
- ✦ Safety management responsibility
 - ✦ No provision of Annex 19 is intended to transfer to the State the responsibilities of the aviation service provider or operator. States possess many tools to manage safety within their system. As part of its SSP, each State should consider the best options for the oversight of aviation activities that may not fall within current ICAO Annexes or that of new or emerging activities.



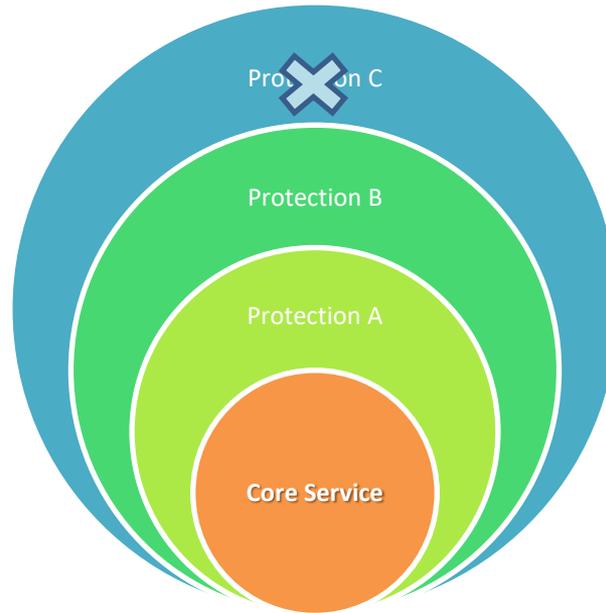
PRACTICAL DRIFT

- ✦ Scott A. Snook's theory of practical drift is used to understand how performance of any system “drifts away” from its original design.
- ✦ Once operationally deployed, the system should ideally perform as designed most of the time. In reality, the operational performance often differs from the assumed baseline performance as a consequence of real-life operations
- ✦ Snook contests that practical drift is inevitable in any system, no matter how careful and well thought out its design. In reality people will generally make the system work on a daily basis despite the system's shortcomings, applying local adaptations (or workarounds) and personal strategies. These workarounds may bypass the protection of existing safety risk controls and defences.
- ✦ Safety assurance activities such as audits, observations and monitoring of SPIs can help to expose activities that are “practically drifting”. Analysing the safety information to find out why the drift is happening helps to mitigate the safety risks.





Levels of protection /Levels of degradation of ATS





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Services Limitation /Degradation





What is Normal Operations?

- ✈ Conforming to a standard; usual, typical, or expected.
- ✈ Serves as the standard.





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.





SAFETY RISK MANAGEMENT

- ✈ Hazard. A condition or an object with the potential to cause or contribute to an aircraft incident or accident.
- ✈ 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.
- ✈ Hazard identification methodologies. The two main methodologies for identifying hazards are:
 - a) Reactive. This methodology involves analysis of past outcomes or events. Hazards are identified through investigation of safety occurrences. Incidents and accidents are an indication of system deficiencies.....
 - b) Proactive. This methodology involves collecting safety data of lower consequence events or process performance and analysing the safety information or frequency of occurrence to determine if a hazard could lead to an accident or incident.



SAFETY RISK MANAGEMENT

- ✈ Safety risk. The predicted probability and severity of the consequences or outcomes of a hazard.
 - ✈ Safety risk probability: Safety risk probability is the likelihood that a safety consequence or outcome will occur.
 - ✈ Safety risk severity: Once the probability assessment has been completed, the next step is to assess the severity, taking into account the potential consequences related to the hazard. Safety risk severity is defined as the extent of harm that might reasonably be expected to occur as a consequence or outcome of the identified hazard.
- ✈ Safety risk tolerability. Safety risks are conceptually assessed as acceptable, tolerable or intolerable.
 - ✈ Safety risks assessed as initially falling in the intolerable region are unacceptable under any circumstances. The probability and/or severity of the consequences of the hazards are of such a magnitude, and the damaging potential of the hazard poses such a threat to safety, that mitigation action is required or activities are stopped.



Management Dilemma

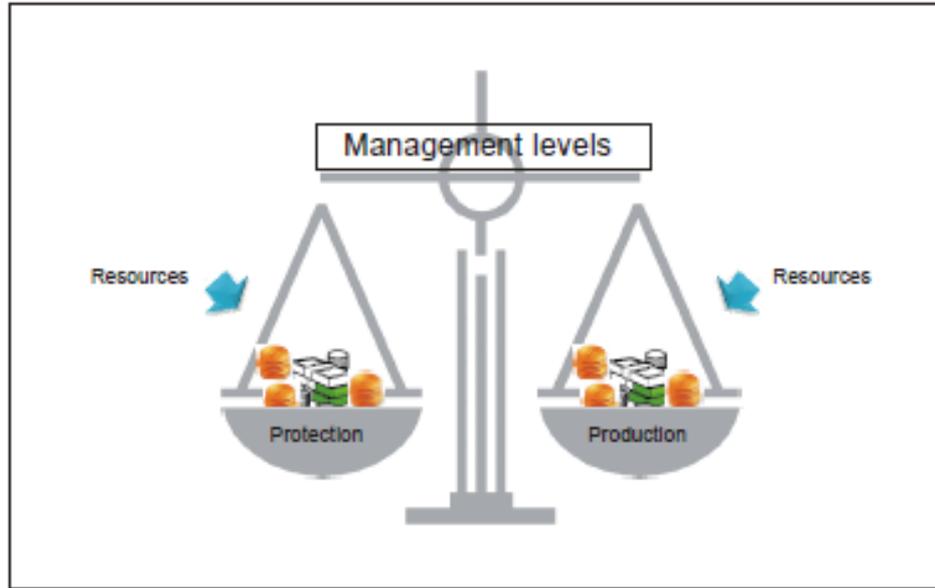


Figure 3-1A. The management dilemma



SAFETY CULTURE

- ✈ Safety culture has been described as “how people behave in relation to safety and risk when no one is watching”. It is an expression of how safety is perceived, valued and prioritized by management and employees in an organization, and is reflected in the extent to which individuals and groups are:
- aware of the risks and known hazards faced by the organization and its activities;
 - continuously behaving to preserve and enhance safety;
 - able to access the resources required for safe operations;
 - willing and able to adapt when facing safety issues;
 - willing to communicate safety issues; and
 - consistently assessing the safety related behaviours throughout the organization.





Compliance + Performance





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North Atlantic
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Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Sub-office
Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU



STATES' SAFETY OVERSIGHT RESPONSIBILITY

- ✈ While recognizing the fundamental principle that every State has complete and exclusive sovereignty over the airspace above and within its territory, the Chicago Convention also establishes the privileges and obligations of all Contracting States on civil aviation activities. It is the articles of the Chicago Convention and its 19 Annexes, covering the entire spectrum of civil aviation operations, that underpin the safety oversight responsibility of Contracting States.



SAFETY OVERSIGHT

✈ Annex 19 — Safety Management (Second Edition, July 2016) defines safety oversight as:

“a function performed by a State to ensure that individuals and organizations performing an aviation activity comply with safety-related national laws and regulations”.



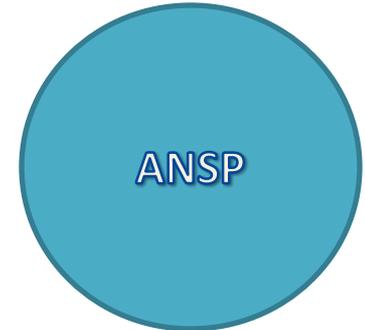
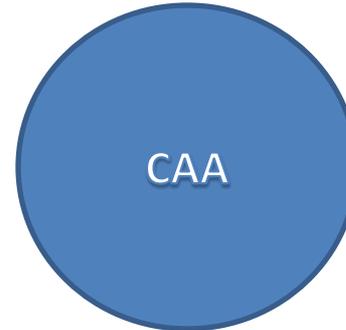
ESTABLISHMENT OF SERVICE PROVIDERS

- ✈ Civil aviation authority (CAA). The governmental entity or entities, however titled, that are directly responsible for the regulation of all aspects of civil air transport, technical (i.e. air navigation and aviation safety) and economic (i.e. the commercial aspects of air transport).
- ✈ Service provider. An organization providing aviation products and/or services. The term thus encompasses approved training organizations, aircraft operators, approved maintenance organizations, organizations responsible for type design or manufacture of aircraft, engines or propellers, air traffic service providers and other air navigation service providers and aerodrome operators.



ESTABLISHMENT OF SERVICE PROVIDERS

- ✈ Whether or not the provision of ANS and/or the operation of aerodromes is vested outside the CAA, States have to ensure effective and independent safety oversight by the CAA in its role as the regulator. A clear separation of functions and responsibilities between the regulatory authority and the service provider needs to be established, including mechanisms to avoid perceived, potential or actual conflicts of interest.
- ✈ The regulatory authority and service providers should not overlap in structure, responsibility or function. In particular, for the regulatory authority to be able to take effective and independent actions, including enforcement action, if necessary, the regulatory authority and service provider should not report to the same higher level management, unless the State can demonstrate that a “functional” separation has robust checks and balances, and there is no possibility of conflict of interest, including when enforcement action is taken.





ESTABLISHMENT OF SERVICE PROVIDERS

- ✈ In a stringent regulatory role, close day-to-day involvement in the civil aviation industry direction and control of activities would be carried out by the State through an assessment organization. In a passive role, the State would intervene only to institute proceedings or investigatory action in the case of an accident/incident or of a violation of the regulations.
- ✈ The public interest would best be served by a balanced approach, where both the State and the aviation community have clearly defined responsibilities for the safe and efficient conduct of their functions.
- ✈ The State should retain effective control of important inspection functions. Such functions cannot be delegated;
- ✈ A balanced safety oversight system is one in which both the State and the aviation community share responsibility for the safe, regular and efficient conduct of civil aviation activities. This relationship should be established in the primary aviation legislation, regulations and requirements and put into practice.

