



COMPARISON - SMS AND QMS

SMS is not an island! It was originally designed to work in harmony with other programmes and systems such as a Quality Management System (QMS). Therefore, many of the required SMS components, programmes and systems, including certain Best Practice (BP), may already be identifiable and/or established within an Organisation (*albeit*, working in isolation), before the SMS was implemented. Furthermore, those systems and processes may have been functioning safely and efficiently before formal implementation of the SMS.

So why implement an SMS?

A formal SMS brings together and delivers all isolated systems under a singular collective control process. Therefore, often the most significant change, when implementing a SMS, is in 'formalising' existing systems and supporting other philosophies, such as Quality Assurance / Quality Management System (QMS).

Therefore, bearing the above in mind, it is restrictive to discuss a SMS without including its symbiotic partner – QMS. Furthermore, it is essential to examine the relationship between SMS to that of a QMS, if either one is to be completely understood.

In brief, a SMS cannot accomplish its desired Safety mandate alone, it must work in association with other programmes, and the primary one is 'Quality Management (QM). Various systems and components collectively constitute a QMS. Although SMS and QMS share a similar mandate (the prevention of error and loss), they nevertheless serve different masters and perform different functions working toward a common goal. In other words, although SMS and QMS are naturally synergistic, when required to work in isolation, there is an inherent danger of compromise. Table No. 1 clearly illustrates the commonality of the two programmes and what each is trying to achieve in support of the other.

In practical terms, 'Training' is considered to be the third partner or 'leg' that supports both QMS and SMS. Without either one of the three 'Assurance Programmes' (Safety, Quality & Promotion), the proverbial 'three legged stool' will topple and collapse. The relationship to training is obvious and since you are reading this as part of an introduction to SMS, it can be assumed that the training 'leg' is strong and supporting the other two dependent programmes.

The relationship between SMS and QMS is so important that the last release of ISO 9001:2015 incorporated several traditional components of a SMS, including 'Risk Management' and 'Change Management' as principle constituents within a Quality Management System.

Nevertheless, misconception continues to prevail as a result of parallel methods, techniques, tools, terms and references employed between QMS and SMS. As a consequence harmonization between the two respective philosophies is made just that much more challenging. A major difference that separates a QMS from SMS is found within their distinct and quite unique objectives. A QMS primary objective is 'Customer Satisfaction', while a SMS objective is focused on 'End user Safety'.

Further care needs to be taken not to confuse the requirements of an Occupational Health & Safety (OH&S) programme (often referred to as a SMS) with that of an Aviation style SMS. Misperception is further raised when trying to incorporate OH&S requirements into a SMS, although it may at times makes sense to dovetail each under a single yet distinct package (remembering they serve different masters). Obviously, OH&S is an important consideration in running any Organisation; nevertheless, OH&S is quite distinct and is not interdependent on either SMS or QMS. Therefore, in order to keep this narrative short, OH&S will not play a part of this discussion, other than to state categorically that OH&S is not a SMS in an aviation regulatory environment.

In short, Safety Management and Quality Management are highly complementary, working closely together to achieve overall 'Customer Satisfaction' while maintaining and improving recognisable industry Safety Goals. SMS is '**what we do**' while QMS is '**how we do it properly**'.

A golden rule is that QMS must not be allowed to conflict with the SMS or *vice versa*. Although similar functions and processes are employed under each practice, the results are different and quite diverse from each other, albeit, both are accountable for achieving specific results.

It is often erroneously assumed that processes designed to produce a quality product and/or service, by repeatedly performing a function without variation, equates to systematically producing a safe product and/or service; this is not only incorrect but a very dangerous assumption to make. For example, a quality product or service, as defined by an ISO Standard, may nevertheless fail to be a safe product and/or service even though it met all of the Quality specifications.

Why is this?

Because Quality Systems are not designed to investigate incidents or accidents or undertake Risk Assessments *per se*, what they do and do very well, is Audit the '**output of a process**' for variance, which may include examining the cause of the problem i.e. Root Cause Analysis, etc.. On the other hand, although an SMS will also investigate events, the primary focus is concentrated more on 'contributing factors' from all influencing sources. The intent is to improve safety and not just reliability by being more 'Proactive' rather than mostly 'Reactive,

albeit, both have usefulness and purpose. Therefore, a key objective of a SMS is to improve 'Safety Performance' via the reduction and exposure to risk.

A QMS is a means of ensuring that an Organization is meeting Customer (internal & external) requirements (satisfaction) and is continuously improving its processes. A QMS requires a Quality Policy, objectives, process documents and measures that focus on achievement. A QMS ensures that requirements for services, regulations and other policy and control documents are adhered too. Consequently, a QMS is often cited as being the foundation upon which an SMS must first be established.

A QMS has many of the processes that a SMS requires, such as Management Review, analysis of data, Corrective Action, Key Performance Indicators (KPI) and Internal Audit, etc. However, some SMS conceptual differences to QMS processes are quite diverse and include features such as identifying hazards and establishing processes to measure the effectiveness of risk management, mitigation and control.

In essence, QMS is not overly focused on the 'safety record' as such, although it is of concern. A Quality System concentrates predominately on 'Continuous Improvement', as may be accomplished by improving the service/production record rate or refining a process/procedure for efficiency and improved overall performance. Nevertheless, improving 'safety performance' is not the same as improving a 'safety record' (often another source of confusion between the two systems). For example, many Organisations (inclusive of airports and airlines) have exemplary safety records but are still operating with 'high risk behaviour' and/or 'inadequate organizational structure'; typically, without even knowing it. Ironically, these same companies are characteristically compliant in all areas and pass Quality Audits' splendidly every time. Consequently, although these Organisations may not have had a significant incident, they are potentially primed for disaster to strike. In other words, a good safety record, just like a good quality record, does not guarantee future safety. ICAO DOC 9859 is quite specific with regard to the two program's respective separate functions.

What's to be done?

An astute organisation should implement an enterprise-wide Safety Management Systems and organizational safety performance standards, dependent on the effective integration of these two systems to support the delivery of products and services. In the context of SMS, the most significant aspect of integration is with the Company's QMS.

QMS is generally defined, as the organizational structure and associated accountabilities, resources, processes and procedures necessary to establish and promote a system of continuous Quality Assurance (QA) and improvement, while delivering a product or service. Although a Quality Assurance Programmes (QAP) may often be an existing component within an aviation-based organisation, a system wide QMS is typically not: i.e. a QAP is limited within Flight Operations, or may even be absent altogether!

Nevertheless, QA is so important in aviation, Transport Canada has included a requirement for Quality (Note: also read Training) as a separate component within their 6 part SMS Framework. However, it is important to remember that you can only Audit a SMS for 'compliance' (i.e. *are we doing what it is we say we are doing?*) and consequently, the Audit process is not the medium to determine the effectiveness of the SMS programme.

As already stated QMS and SMS are complementary and share similar tools. Nevertheless, QMS is focused on compliance under prescriptive policy/rules and other requirements to meet Customer expectations and contractual obligations; while SMS, is focused on **Safety Performance**. The primary objective of any SMS is to identify safety-related hazards, assess the associated risk and implement effective risk controls. In contrast, a QMS focuses on consistent delivery of products and services that meet relevant specifications. Therefore, both the SMS and QMS must:

- a) be planned and managed;
- b) depend upon measurement and monitoring of performance indicators;
- c) involve all organizational functions related to the delivery of aviation products and services; and,
- d) strive for continuous improvement.

As identified, SMS and QMS utilize similar Risk Management (RM) and Assurance processes, wherein the objective of the SMS is to identify safety-related hazards the Organization must confront and to control the associated risks. SMS is designed to manage 'Safety Risk' and measure 'Safety Performance' during delivery of products and services in a 'proactive' fashion. The Safety Risk Management process aims to eliminate hazards while providing effective controls to mitigate safety risks by maintaining an appropriate resource allocation balance, between production and protection, to meet safety performance requirements.

Nevertheless, a QMS provides consistency in the delivery of products and services to meet performance standards as well as Customer expectations, primarily under a 'reactive' system. To achieve this, a QMS must have an independent assurance function that utilizes a feedback loop to assure delivery of products and services that are fit for purpose and free of defects or errors. It is the independent QA function, which identifies ineffective processes and procedures for further refinement, efficiency and effectiveness.

The two programmes really synchronize when viewed in terms of error and loss, both being applicable in terms of financial waste. Both Quality and Safety practitioners are essentially focused on the same goals, that of providing safe and reliable products and services to Customers and therefore, ought to be trained on various analysis methods including root-cause analysis and statistical trending analysis. Given the complementary aspects of SMS and QMS, it is possible to establish a synergistic relationship between both systems that can be summarized as follows:

- a) SMS is supported by QMS processes such as Auditing, inspection, investigation, root cause analysis, process design, statistical analysis and preventive measures;
- b) QMS may anticipate certain safety issues that exist despite the organization's compliance with standards and specifications; and,
- c) Quality principles, policies and practices are linked to the objectives of Safety Management.

In conclusion, the relationship between SMS and QMS leads to the complementary contributions of each system to the attainment of the Organization's Safety and Quality goals. A summary comparison of the two systems is provided in Table 1.

Table 1 - Summary Comparison of QMS and SMS as a useful analogy of the two disciplines.

QMS	SMS
Quality	Safety
Quality Assurance	*Safety Assurance
Quality Control	Hazard Identification & Risk Control
Quality Culture	Safety Culture
Compliance with Requirements	Acceptance level of Safety Performance
Prescriptive	Performance-based
Standards & Specifications	Organisational and Human Factors
Reactive > Proactive	Proactive > Predictive

*Transport Canada has renamed 'Safety Assurance' within the TC SMS Framework to "Safety Oversight" (Ref. Component 3).