COMPARISON - SMS AND QMS

A Quality Management System (QMS) or a Safety Management System (SMS) are not an island!

SMS was originally designed to work in harmony with other programmes and systems such as a QMS. Therefore, many of the required programmes and systems of an SMS, including certain Best Practice, 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 very safely and efficiently before the SMS. This is one reason why a Gap Analysis (GA) is normally performed before implementing a formal SMS.

So why implement an SMS?

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

Bearing the above in mind, it is restrictive to discuss a SMS without referencing to its symbiotic partner – QMS and *vice versa*, therefore, it is worth comparing and examining the relationship between SMS and QMS.

In brief, a SMS or cannot accomplish its desired Safety mandate alone; it must work in association with other programmes and the primary one is 'Quality Management (QM). Under QM, various Systems and Components collectively establish 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, SMS and QMS are symbiotic and are consequently compromised when required to perform in isolation. 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' (Safety Promotion) is considered to be the third partner or 'leg' that supports QMS and SMS. Without either one of the three 'Assurance Programmes' (Safety, Quality & Safety 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 QMS and SMS, it may be assumed that the training 'leg' is strong and supporting the other two dependent programmes.

There above relationship is so important that the last release of ISO 9001:2015 incorporates 'Risk Management' (traditionally a SMS element) as a principle component 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. Nonetheless, a major difference that separates a QMS from SMS is found within their distinct and unique objectives. A QMS objective is '***Customer Satisfaction***', while a SMS objective is '***End user Safety***'.

Further care needs to be taken not to confuse the requirements of an OH&S (often referred to as a SMS) with that of an Aviation style SMS). Confusion 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 purposes). Obviously, OH&S is an important consideration in running any Organisation; nevertheless, OH&S is quite distant and is not interdependent on either SMS or QMS. Therefore, in order to keep this narrative short, OH&S will not be 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***'; QMS is '***how we do it properly***'.

A golden rule is that QMS and SMS must not conflict with each other. Although similar functions and processes are employed the results are quite distinct and diverse within each program.

It is often erroneously assumed that processes designed to produce a quality product and/or service, repeatedly performing a function without variation, equates to systematically producing a safe product and/or service; which 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 <u>safe</u> product and/or service, even though it met all of the Quality specifications.

Why is this?

Because Quality systems do not 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. Although an SMS can also investigate events, the primary focus is on the 'contributing factors' from all influencing sources - the intent being to improve safety. Therefore, a key purpose of an 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 followed. 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 Audit functions, etc. However, some SMS conceptual differences to QMS processes are quite obvious and include such features 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, as already stated, improving 'safety performance' is not the same as improving a 'safety record' (often another source of confusion between the two systems). For example, there are many companies (inclusive of airport and airlines) that have exemplary safety records but which are still operating with 'high risk behaviour' and/or 'inadequate organizational structure' – typically without even knowing it! Although these organisations may not have had a significant incident, they are primed for disaster to strike! In other words, a good safety record, just like a good quality record, does not guarantee future safety, albeit, a major component! ICAO DOC 9859 is quite specific with regard to their 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 QMS & SMS to support the delivery of products and services. Consequently, 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. QMS is often an existing component with many Organisations to some extent or other. It is so important that in Aviation, Transport Canada has included a requirement for Quality as a separate Component within their 6 part SMS Framework.

As already stated, QMS and SMS are complementary, sharing similar tools. 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 the consistent delivery of products and services that meet relevant specifications. Nonetheless, both a SMS and/or 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. The objective of the SMS is therefore 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. 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.

Furthermore, a QMS provides consistency in the delivery of products and services to meet performance standards as well as Customer expectations. 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 this independent QA function, which identifies ineffective processes and procedures for further refinement, efficiency and effectiveness.

Safety and Quality practitioners are essentially focused on the same goal of providing safe and reliable products and services to Customers. Both Quality and Safety specialists should be trained on various analysis methods including: Root Cause Analysis (RCA) and Statistical Trending Analysis (STA). Given the complementary aspects of SMS and QMS, it is possible to establish a synergistic relationship between both systems and 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 summary, 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 below under 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. TCCA SMS Six Part Framework - Component 3).