Problems of SMS Implementation in Transition

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Introduction

The Safety Management System (SMS) is the basis of the new proactive concept of accident/incident prevention, which in a methodological sense assumes risk identification within the latent phases of the potential accident/incident causal appearance. In comparison to the traditional approach, this concept features system analysis tools and failure detection within all segments and all levels of air transport governing ─ from regulator to operators of airports, to airlines and air traffic management.

For European transition countries, in regard to socio-economic status and strategic priority of regional development, safety culture development and safety management implementation have become a precondition for their integration and competitiveness in the international aviation market. An aggravating circumstance in this context is insufficient administrative capacity for regulation and oversight of safety standards implementation.

This paper elaborates the regulatory framework of SMS establishment, as well as the problems of SMS implementation in transition countries' air transport operations. Finally, the applicative

model of integrated SMS is suggested, which would balance the regulatory and operational safety processing of the air transport system in a synergistic way.

Following the principles of the EU Common Transport Policy, as well as best practices in transport management, strategic guidelines have also been defined in the field of air traffic. They can be generalized as follows: strict separation of the functions of regulators (CAAs) and operators (air carriers, air traffic control, airports), adopting of international rules and standards in national air regulations, commercialization and privatization of service providers, provision of fair business conditions in the free market (i.e., preventing monopolies), integration of local communities and the private sector into the investment projects, etc.

The problems arose during public discussion about the Transport Strategy, and the ideas expressed by the department administration and operators owned mainly by the state, as well as discussions regarding government interests, and the interests of local communities prove implicitly the existence of the "transition syndrome," i.e., the overlapping of politics, administration and state-owned industry with the single common denominator: the budget.

Although the government has declared its political willingness and readiness for structural reforms, because of its evident inertia toward changing the acquired routines and administrative principles, the lack of experienced managers and professional administrative staff, as well as the weak influence of the public, the development of safety culture is not sufficient.

Faced by the need to comply with the international standards, the industry adapts faster to the requirements set by international aviation associations and the international air services market, whereas the regulatory and administrative functions get continuously weaker.

The need to organize independent safety authority in Croatia can also be argued by the fact that it refers to a relatively small "aviation community," to a relatively small number of air operators and to a relatively small number of CAA employees, and that in a "known circle of professionals" who have been changing workplaces during one peacetime decade working both in the aviation industry and regulatory areas, it is difficult to expect consistency of regulation in implementing stricter safety control.

Experiences, however, also reveal the potential risks, which in the case of stronger budget discipline and substantial financial restrictions in the aviation operational area can negatively influence the implementation of the safety standards, especially under the conditions of insufficient activity of independent inspection or the dubious regulatory status of the CAA.

Definition of Safety

Because no regulation or standard offers an explicit definition of the term safety, the most appropriate and applicative definition we can select is: Safety is the state in which the risk of harm to persons or of property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management.[1]

The category of aviation safety and its maintenance is closely connected with terms of quality, transparency and process management of all entities involved in the aviation system. Therefore, the safety management system correlates to a great extent to quality management and human resources management. The analogous term for safety culture is not the question of implementation but rather development. That is the primary reason for huge differences in the application of safety standards.

Safety is the state, causal and principal, of a system in operation, which includes practical means of assurance — protection, regulation and control.[2]

From the civil aviation perspective, five generic features characterize a SMS. These are:[3]

- A comprehensive systematic approach to the management of aviation safety within an organization, including the interfaces between the company and its suppliers, sub-contractors and business partners.

- A principal focus on the hazards of the business and their effects upon those activities critical to flight safety.

- The full integration of safety considerations into the business, via the application of management controls to all aspects of the business processes critical to safety.

- The use of active monitoring and audit processes to validate that the necessary controls identified through the hazard management process are in place and to ensure continuing active commitment to safety.

- The use of quality assurance principles, including improvement and feedback mechanisms.

The main elements of safety management are:

- Safety Management Plan

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[1] Safety Management Manual. ICAO, Montreal, 2006, p. 1-1
[2] Source: Sanja Steiner: Elements of Aviation Safety, University Coursebook (in Croatian), University of Zagreb, Faculty of Transport and Traffic Sciences, Zagreb, 1998.
[3] Source: Guidance on Safety Management Systems Development, Advisory Circular, Transport Canada, http://www.tc.gc.ca/civilaviation/IMSdoc/ACs/100/107-001-toc.htm

- Documentation

- Training

- Safety Oversight: Reactive/Proactive

- Quality Assurance

- Emergency Response Preparedness

Figure 1: Ten Steps for Safety Management Development.

Source: Safety Management Manual. ICAO, Montreal, 2006, p. 12-3

Safety Management System: Revolutionary New Concept or a New Label for Something Old?

Although nobody can deny the apparent benefits of an SMS, there have been numerous opinions that the SMS as just another label for something already existent. Indeed the basic theoretical components have been here for decades: the vastly influential books of James Reason are almost two decades old, various data gathering systems have been here for a lot longer, etc. Indeed, "you may well have an SMS already."[4]

Reducing SMS into its basic components, it can be clearly established that at least two of the three building blocs were long ago defined and required by applicable regulations.

Three building blocs of an SMS are:

- Organizational structure with clearly defined processes and responsibilities;

- Structured and controlled data gathering, analysis and dissemination system; and

- Corporative safety policy extending throughout an organization into a safety culture.

A requirement for an organizational structure to explicate processes and responsibilities is included in JAR-OPS regulations, under the influence of ISO 9001 standards. A requirement for various data gathering systems is also included in JAR-OPS. What is really new is the component of management commitment and organizational safety culture.

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[4] Martin Ambrose, chairman of the regulatory European Aviation Safety Agency (EASA) safety standards committee and manager of air safety and maintenance at the European Regions Airline Association (ERA) on an ERA workshop. Turner, A.: *Beyond blame*. Flight International, 18-24 November 2008.

Unfortunately, that very component is the one that is hardest (if at all possible) to measure and therefore the most difficult to oversee. The need to assess if an organization's management commitment to safety is genuine and to assess the level of its safety culture is a challenge to regulatory agencies worldwide.

Regulatory Oversight Concept: Problems and Limitations

The traditional approach of regulatory oversight is the most up-front method of ensuring the safety standards of any organization. However, as the organization evolves in size and complexity, regulatory oversight becomes less effective.

Key reasons for regulatory oversight ineffectiveness are:

- Limited financial resources of national authorities;

- Limited human resources in terms of experience and know-how; and

- Limited scope of oversight.

Institutions entrusted with regulatory oversight are always limited in the financial and human resources at their disposal. This leads to less than adequate frequency and depth of oversight activities for larger organizations (for example airlines and major airports) and low prioritization for small organizations (for example corporate and general aviation) which are often left on their own.

The magnitude of the problem is in reverse proportion to the size of a state's aviation system. Compared to Western Europe, transition countries are not only less wealthy, but the

fragmentation of larger states at the beginning of 1990s led to the fragmentation of national civil aviation authorities, with related fragmentation of resources available.

The limitation in experience and know-how is partially related to the limitations in financial resources available. It is unrealistic to expect an industry expert to agree to civil servant rewards.

Even with a competitive rewarding scheme, an expert dedicated to oversight is slowly but surely losing expertise, being less in touch with industry developments. The problem is further extended by the apparent need of authority personnel to display a degree of stateliness, which sometimes prevents them from seeking additional understanding of industry practices.

In order to be objective, any oversight needs to be based on pre-defined requirements. The objective oversight process then comes down to whether a certain requirement is met or not.

Worldwide, the requirements that would cover all aspects of an effective SMS are not clearly defined. For example, it can be verified whether an organization has a safety reporting system, but there are no requirements or even guidelines for the reporting rate. Therefore, an organization can have a safety culture in which there are no incoming safety reports, but still be fully compliant with all requirements for a safety reporting system.

Inter-Airline Oversight Concept: A Solution?

The trend of airline code-sharing and alliances brought a possible solution to regulatory oversight limitations. Inter-airline auditing, meant as a means to ensure equal-or-higher level of safety as well as service, obliged airlines to adopt certain standards that could never be enforced by national authorities.

In inter-airline oversight the main limitations of regulatory oversight are removed: financial resources are easily justified by expected gains, people performing oversight have know-how and experience from their own operations and the scope is not limited by existing regulations.

This concept is applicable not only to airlines, but also airports and maintenance organizations, which are under airline oversight as contractors.

Although the benefits of inter-airline auditing are not doubtful, the concept is often compromised by profit-driven "flexibility" of standards in any commercial organization.

For example, an airline can demand a certain standard for airport safety. In Western Europe or North America, with a choice of airports and choice of ground handling organizations, these standards can be enforced. However, in other parts of the world there is often a single airport for a region (or even a state), with a single ground handling organization, which is at the same time an airport operator. In that case, there are no means to enforce a certain safety standard: an airline can operate at a given airport with its present safety standard — or not. Usually, airline management will accept such a degradation of established safety standards in order to keep (or win) market share.

Figure 2: Present State of Regulatory Oversight: Weak and Intermittent Oversight From National Authority, Oversight From Airlines Varying Depending On an Individual Airline's Needs
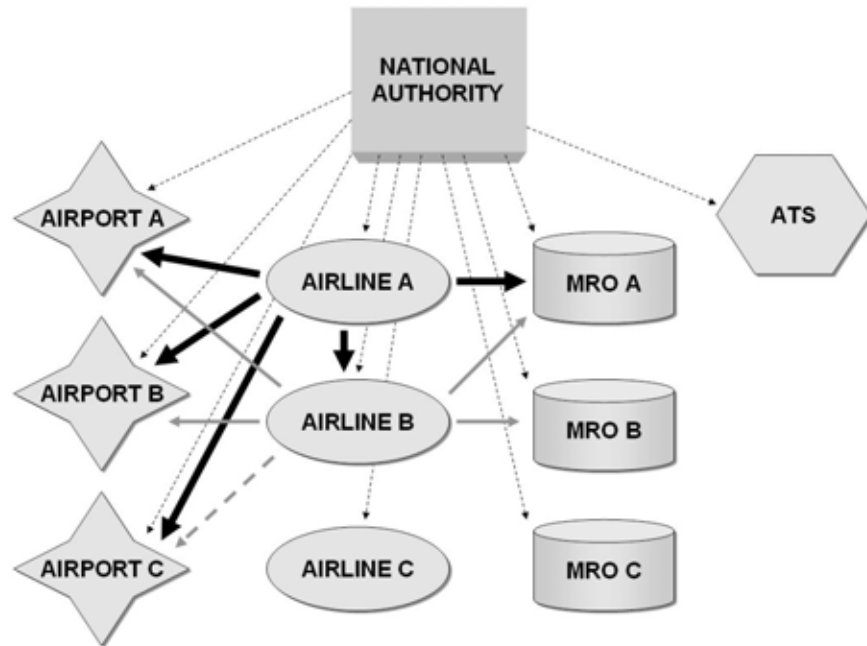
Challenges for an Airline in a Weak Regulatory Environment

The primary responsibility for safety of an organization is within the organization itself. The level of safety is established and maintained by management commitment as well as good safety culture. However, no matter how good (in safety terms) an organization is, the lack of regulatory oversight brings certain problems:

1. Inability to prove the established standard

2. Competitive disadvantage

3. International limitations

4.   Transition of a bad image

5.   Lack of guidance

Adequate regulatory oversight is taken for granted by the flying public as a guarantee of safety but also wished for by potential industry partners as a guarantee of quality. If the oversight is inadequate, a company has limited means to prove its value. Activities needed to additionally prove what adequate oversight should have already proven will then be paid for by the company, not authority.

This problem was partially solved with the establishment of the IATA Operational Safety Audit (IOSA), avoiding the need of multiple audits. However, an increasing number of applying airlines throughout the world inevitably puts pressure on the limited number of audit organizations available. Even if "softening" of criteria is avoided, the IOSA certificate is losing the image of industry leader it used to bring. The means to distinguish oneself from the competition as an industry leader must then be found elsewhere. Some carriers are exploring the concept of Alternative Training and Qualification Program (ATQP)[5] as the next benchmark.

The other limitation of IOSA as a potential substitute for authority oversight is its focus on airlines. After all, it was conceived by an airline association for the airlines. Maintenance, airports and air traffic services were never meant to be served by the system. It is the concept, not the product that could be usable elsewhere.

In the last two decades or so, we have witnessed a dramatic increase in the low-cost charter sector throughout Europe, Russia, the Middle East and North Africa. While most of these

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[5] European, known in the United States as Advanced Qualification Program (AQP).

carriers are genuine players, there are already proven cases of substandard safety organizations and many more are waiting to be discovered.

With deregulation and globalization, substandard practices of some third-world countries are pouring over to Western Europe, where sound safety standards are assumed. Although Europe is protecting itself with Safety Assessment of Foreign Aircraft (SAFA) inspections and blacklisting of carriers, these methods are doing nothing to improve the safety in the regions where the blacklisted carriers come from.

Malpractice carriers are not third-world exclusively. The combination of liberalization and wet/dry leasing is making it increasingly difficult to control any such operation. While it is all legal, in the real world it is hard to perform adequate oversight of an operation in country A, marketed by airline from country B, which is wet leasing aircraft and crew with an Air Operator's Certificate (AOC) of country C, whose crew is actually certified in country D and the responsible managers are managing it all from country E. Even when malpractice is proven and the AOC is lost, with no owned assets and a contract workforce it is too easy to just rebrand the carrier and apply for another AOC.

It can be argued that market forces should oblige carriers to "behave" if they don't want to be blacklisted from a certain market. However, market forces are also acting in the opposite way. If the operation is to be conducted in an area of weak regulatory oversight, a substandard carrier will have lower costs and therefore a competitive advantage over a carrier with an adequate safety standard. Balancing between production and protection, the area between bankruptcy and accident just got thinner. The moral for the carrier is clear: in order to keep a competitive

advantage one must not exceed what an authority can enforce (even if it is below the legal requirement).

While Western Europe chose the route of assessing and blacklisting the carriers, the United States's FAA is assessing national authorities and limiting or banning the whole countries' aviation systems. This system limited or banned some healthy air carriers from entering the U.S. market, because they were based in countries with insufficient regulatory oversight.

If the regulatory authority attains the image of sloppiness, the image will inevitably transfer to its industry, especially its flag carrier. For example, when Croatia was awarded Category II by FAA, the news in the media was often accompanied by a picture of Croatia Airlines airplane. Although Croatia Airlines never flew or intended to fly to the States, the transfer of a bad image was certainly there.

In the ever-changing world of aviation, there is often a need for coordination and synergy among particular entities. Some projects are just too big for a single organization, especially in the regions where fragmentation of states resulted in fragmentation of aviation systems. In such cases, an authoritative organization is required: trusted, unbiased and on a national level. Such an organization could provide a common standard, knowledge base and guidance for the industry.

If the national authority is weak in financial and human resources, such guidance is absent.

**The Present Degree of SMS Implementation in Croatia**

At this moment, a certain level of SMS elements can be traced in all Croatian air transport entities — airlines, international airports, maintenance organizations and air traffic services. However, performance-based assessment shows a clear difference between Croatia Airlines and

the other entities. The reason for this is obvious — relying heavily on its code-share agreements with major European carriers, principally Lufthansa, Croatia Airlines was historically forced to keep in line with the latest safety and quality standards. Therefore, as pointed out previously, it was commercial inter-airline oversight and not the regulatory oversight that led Croatia Airlines to the present state of its SMS.

As for various components of SMS in Croatia Airlines, formal safety reporting systems were in place since the beginning of operations, as well as safety briefings of operational management and formal reporting of safety issues to operational personnel. In the year 2000, the first internal audit of flight operations was conducted, based on ISO 9001 and JAR-OPS, and a non-punitive policy was signed by the accountable manager and a confidential reporting scheme was started. Flight data monitoring started in 2004 and now covers the entire fleet. Formal risk assessment started in 2006 and in 2007 all elements were combined and organizational structure amended to form an integral Safety Management System.

Figure 3: Number of Safety Reports (Red Line) and Confidential Reports (Blue Line) per Number of Operations in Croatia Airlines
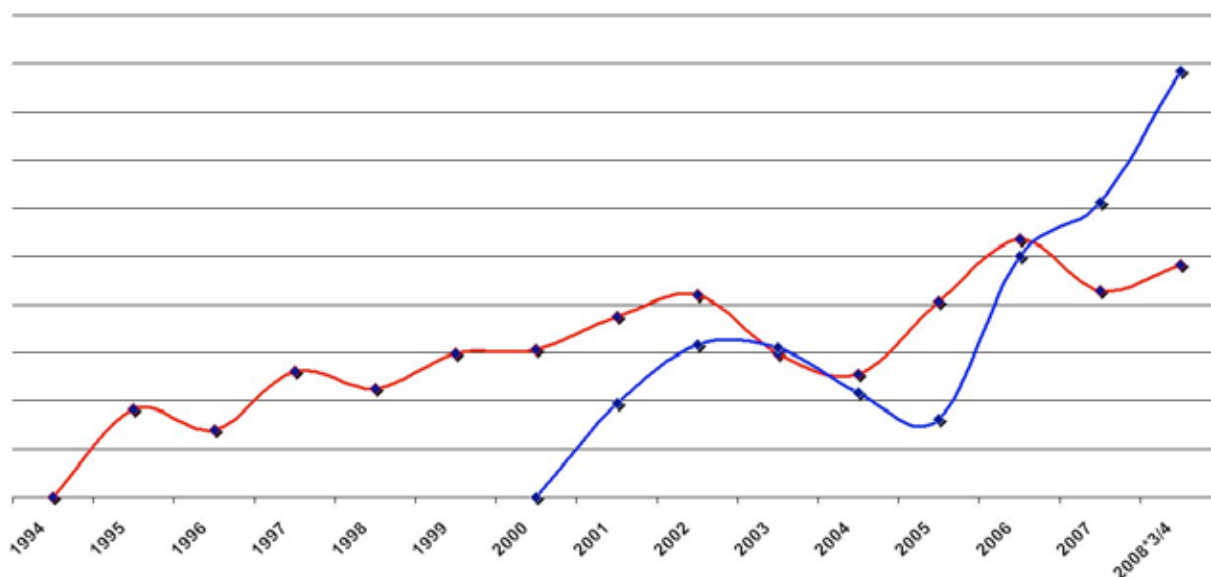
On the other hand, other air carriers in Croatia were historically only responsible to keep up with regulations. There were provisions for safety data gathering, but no formal process and weak data processing afterwards. The small size of their back-offices often led to over-flexibility of hierarchy, creating overlapping of responsibilities and conflict of interest. Recently, there are notable developments in Dubrovnik Airline, again driven by market forces, not the authority requirements. The airline was the youngest in the world and the first charter-only carrier to gain an IOSA certificate.

Airport operators are scarcely regulated regarding SMS. The first regulation regarding safety management was brought in 2005, requiring an airport operator to act in accordance with the airport manual. It is required for the airport manual to include a chapter on apron safety management, but there is no further requirement or regulation. It is therefore once again left to an operator itself to recognize the value of SMS and invest in safety. Consequently, attitudes toward

safety and safety results vary among operators. While Split airport has a clear line of safety responsibility, with a clear system of reporting and safety data gathering, smaller regional airports present quite a different attitude. For example, being asked for additional information about a birdstrike, one airport replied "nobody saw anything; we doubt the event occurred."

SMS is also hardly regulated in air traffic control. Regulation published in 2008 requires "a system for management of safety" but, just as with airports, there is no further requirement.

Conclusion — The Applicative Model of Integrated SMS

The limitations of the regulatory oversight system, described above, lead us to the conclusion that authority representatives should limit the oversight activities they perform in person. Instead, industry professionals should be utilized as much as possible.

To avoid profit-driven bias, industry professionals performing oversight activities should be carefully selected to ensure objectivity. This would then be ensured by authority, which would organize oversight activities and schedule personnel to ensure adequate expertise and objectivity.

In the small national aviation systems it will prove difficult to ensure neutrality. A regional exchange could then take place. In Croatia, an independent agency is being formed, which will gradually assume oversight activities. Utilization of the mentioned principles could be the way to ensure a strong and credible safety oversight.

Figure 4: Proposed Regulatory Oversight: National Authority Organizing Oversight, Analyzing Reports and Keeping Records. Oversight Activities Are Performed by Industry Professionals.
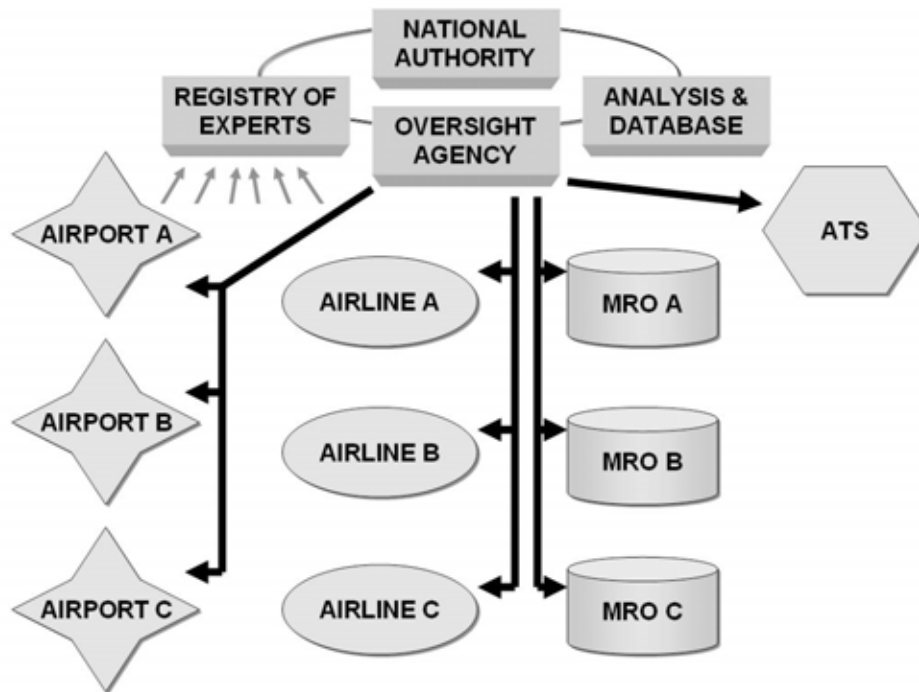
The approach of writing regulations and requirements and then checking if operators' policies and procedures reflect them should be changed to a more performance-based approach.

Checklists should be as detailed and precise as possible, to ensure the organization is truly committed to safety, not just fulfilling requirements. For example, a call center might be required for emergency response. If there are no further specifications, a call center may consist of a person with a phone, which is absolutely not sufficient for the task, but sufficient to satisfy the requirement.

Checklists should also address whether a safety system is just in place or really active. For example, a policy is required to encourage flight crewmembers to report the observed safety

event.[6] However, there is no further inquiry whether that policy actually works. An operator can have zero recorded safety events and still be perfectly eligible. This essentially comes down to assessment of safety culture —a challenge that is yet to be addressed.

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[6] IOSA FLT 3.15.1.