Peer Reviewed Safety Management Systems: Collaboration for Continuous Improvement

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Abstract

Collegiate aviation program leaders have no greater responsibility than assuring safe flight operations. A Safety Management System (SMS) is an effective framework to present and reinforce key safety principles and can be effectively tailored for the collegiate aviation flight training environment. The collegiate academic tradition of peer review can be effectively leveraged to enable collaboration between collegiate aviation programs and provide a mechanism for continuous improvement of participating programs. This presentation provides a model for establishing a peer review process for collegiate Safety Management Systems and the construction of a password-protected repository for reviewed programs which can be referenced by others who submit a peer-reviewed SMS program. Sharing and collaboration between those who have developed reviewed programs will provide a forum and opportunity to propagate the continuous improvement tenet of SMS. Continuously improving Safety Management Systems reinforce key safety concepts to aviation students as well as to support the construction and maintenance of a safety culture in the flying operations portion of a collegiate aviation program.
Accountability and Responsibility: Collegiate Pilot Schools

- College and university presidents of aviation programs with pilot schools are accountable and have no greater responsibility than to ensure safe flying operations and aviation maintenance practices.
  - Delegate responsibility but still accountable
  - Aviation program leaders have no greater responsibility than lives of students and staff and are accountable to those appointed above them
- Collegiate aviation programs have a special responsibility to prepare safe, effective graduates
Farmingdale State College had:
- Two academic safety courses
- Offered in 2nd and 4th year
- Private, Commercial, Instrument Ground
- TCOs

Now has:
- Verifiable safety program; introduce from first day of pilot training; safety culture!
- Safety Management System (SMS) recommended by ICAO, FAA
- Prominent collegiate aviation safety profile; active, dynamic program; continuously improve
Structured means of safety risk management decision making

Means of demonstrating safety management capability before system failure occurs

Increased confidence and risk controls through structured safety assurance processes

An effective interface for knowledge sharing between regulator and certificate holders

A safety promotion framework to support a sound safety culture
SMS

- FAA: what to do not how to do it
- ANPRM 2009: SMS proposed for virtually all aviation service providers including Part 141 Pilot Schools
- ANPRM withdrawal 2011: FAA focus on Part 121 (major airlines) Part 139 (airports)
- Expectation of future requirement for other aviation service providers including Part 141
No formal program?

- Freiwald, Lenz-Anderson, Baker 2013
- 2013 study of multinational flight training organization with 2 US campuses
  - April 2010-July 2011: 4 fatalities in 2 separate accidents, 5 aircraft damaged
  - Survey + interviews
  - Finding: organization trusted that employees would behave in a safe manner only because of fear of having an accident on their personal record that could ruin their flying careers
- Conclusion: build safety culture through SMS
Collegiate Aviation Programs and Safety

- Over 300 two-year and four-year programs worldwide (Av Scholars 2015)
- How many have verifiable safety programs??
- Aviation Accreditation Board International (AABI)
  - Specialized accreditation (CHEA)
  - Requires incorporation of key SMS concepts
- 31 schools currently listed as accredited and therefore have some verifiable safety program
“Raise the bar”

- AABI, University Aviation Association (UAA), Conference organizers (A3iR) promote SMS
- Next step up: peer review and then publish collegiate aviation program Part 141 safety management system
  - Publish in password protected library accessible only to contributors
- Research question: Is peer review viable for Safety Management Systems?
Peer Review Lit Review

- Practiced over more than 3 centuries: 1752 “Philosophical Transactions” Royal Society of London (Spier 2002)
- Professional responsibility to validate scientific and technical publishing (Grainger 2007)
  - Quality based on timely, unbiased, ethical feedback
- Quality and value (Jennings 2006)
  - Revision after review
  - Significantly improve the document
  - Benefit author and future readers
Roles of scholarly journals for communities of interest (Schaffner 1994)

- Build a collective knowledge base
- Communicate information
- Validate quality of product
- Distribute rewards
- Build scientific community
Criticism of peer review (Smith 2006)

- Slow and expensive
- Inconsistency
  - “I found this paper an extremely muddled paper with a large number of deficits”
  - “It is written in a clear style and would be understood by any reader”
- Bias
  - Against women or authors from institutions of low prestige
  - Pressure to accept low quality from well known practitioners
- Potential for abuse
  - Stolen ideas
  - Unjustly harsh or slow reviews
  - Beat a competitor
Peer review is viable for Safety Management System

- Cited strengths: validation, quality, iterative improvement, share knowledge, build community, build collective knowledge base

- Overcome weaknesses (Smith 2006)
  - Slow and expensive: safety motivation
  - Inconsistent: evaluate against ICAO or FAA standards
  - Bias: no limitations on number of SMS publications
  - Stolen ideas, unjust harshness: share ideas, collaborate
Model for peer reviewed SMS

- Construct and maintain password protected online peer reviewed library
  - AABI?
  - UAA?
  - ERAU Scholarly Commons?
  - Others?
- Seek peer reviewers
  - Experts resident in collegiate aviation programs
  - AABI, UAA Safety Committees
  - Contributors
Peer review process

- SMS document submitted electronically
- Reviewed by two or three peer reviewers
  - Quality and compliance, new ideas
- Noncompliant documents returned
- Compliant, validated documents are published
- SMS programs are available for review by other contributors and practitioners
- Associated real-time online blog
- Choose "best practices" annually
Peer reviewed and Published SMS

- it raises the profile and increases the prominence of aviation safety in collegiate programs
- it builds a community of specific interest
- it shares vital safety knowledge
- it promotes and improves safety in the general aviation domain
- it may prompt other safety management systems research
- it allows for creativity
- it encourages collaboration among practitioners and continuous improvement of individual programs
Peer Reviewed and Published SMS

- interest to the ICAO or to the FAA?
- a model to encourage voluntary implementation of SMS programs in other sectors of the national or international aviation domain
- peer review process could be considered "self-regulation" with less requirement for oversight by regulators
- Collaborate with the FAA or other international regulators
  - further promote and spread the SMS concepts which they actively promote.
We are accountable for and have no greater responsibility than the safety of our students and employees.

We must actively fulfill this obligation through deliberate action.

Peer reviewed, published SMS: collaborate for continuous improvement
References


Notes


- Questions or comments on this presentation or concept? Contact author, Dr. Michael Canders, canderm@farmingdale.edu, 631-942-0985.