Safety Management Systems

2022 MARPA Annual Conference

Members-Only Meeting

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We've All Got Quality Systems, Already …

Why should we care about SMS?

- **It is being required by regulations**
  - ICAO "mandated" it and established the "standard" for governments to follow
  - FAA and EASA already require SMS for air carriers
  - EASA is imposing SMS requirements on manufacturer and repair stations
    - Regulations have been released
    - We are in the phase-in period
    - Includes parts manufacturers
  - **FAA is planning to release SMS requirements for repair stations and certain manufacturers (targeted for December)**

FAA SMS Regulations

- Existing FAA regulation (14 C.F.R. Part 5) apply SMS to air carriers
- FAA is planning to release SMS requirements for repair stations and certain manufacturers
  - Exact scope is not public
  - Published materials suggest it will probably **not** apply to PMA holders

- PMA holders may, nonetheless, have lingering concerns

Some Lingering Concerns

- By the 1990s, TC/PC holders were disparaging PMA holders on the grounds that PMA holders had a Fabrication Inspection System (FIS) while PC holders had quality control requirements under Subpart G

- We countered that by unifying the production quality assurance requirements for PMAs and PCs under 21.137

- **FEAR**: PC holders could once again disparage PMA holders for failure to have SMS programs

Some Lingering Concerns

- EASA appears to be applying SMS requirements to their parts manufacturers

- JCAB has applied SMS requirements to 145 organizations

- **FEAR**: Non-US customers holders could insist on SMS programs to mitigate safety hazards

- **FEAR**: Non-US authorities could require SMS as a special condition for entry into their market

MARPA's Current Position

- MARPA sees both safety value and commercial value in SMS

- MARPA recognizes that SMS reflects a commitment of resources

- **MARPA will not ask for SMS to apply to PMA holders by regulation (at this time)**

- **MARPA plans to take steps to facilitate voluntary adoption of SMS among our members who wish to adopt SMS**

Why Else Should We Care About SMS?

- It can add safety value
- It can add management tools to help management understand the organization's safety posture
- It can add management tools to help management understand the organization's safety response
- It can offer an improved mechanism for proactive management of risk
- It can offer an improved mechanism for managing change

But to get these benefits,

you have to build an effective system

Let's Talk About What SMS Looks Like

A Very Quick Summary

SMS Is Not…

- SMS will not be a drop-in replacement for your existing quality assurance system
  - But it might coordinate with, and rely on, your quality assurance system
- SMS is not the last-best-system you will ever use
  - There is always another system
  - But SMS should stick around for awhile because of the upcoming regulations
- SMS is not simple – it is a complicated structure of interlocking pieces
  - But many of the system elements may already exist in your existing model
  - If the pieces work together properly, then they can use their synergy to make this system even more valuable than the pieces

SMS is Proactive

- SMS identifies hazards (what if?) and proactively assesses them to identify their risk level
  - SMS invites scrutiny to identify hazards (without necessarily waiting for an occurrence to reveal the hazard)
  - SMS proactively mitigates the risk of hazards to <u>an acceptable level</u>
  - SMS uses *Safety Assurance* mechanisms and performance indicators to ensure that the mitigations are being successful

Mitigating "Black Swan" Events

- The problem with unpredictable events is that you cannot predict them

- But you can predict (and mitigate) the types of hazards that could face the business

- For example, few people predicted that Covid-19 would effectively shut down the world

- But you could have predicted, and mitigated, a hazard of inability for staff to be able to reach the office (for any reason)

The Four Components of SMS

Safety Policy and Objectives

Safety Assurance

Safety Risk Management

Safety Promotion

Four Components

1. Safety policy and objectives	3. Safety assurance
2. Safety risk management 2.1 Hazard identification 2.2 Safety risk assessment 2.3 Safety risk mitigation	4. Safety promotion 4.1 Training and education 4.2 Safety communication

Four Components: Each Has Elements

1. Safety policy and objectives
    1.1 Management commitment
    1.2 Safety accountability and responsibilities
    1.3 Appointment of key safety personnel
    1.4 Coordination of emergency response planning
    1.5 SMS documentation
	3. Safety assurance
	    3.1 Safety performance monitoring and measurement
	    3.2 The management of change
	    3.3 Continuous improvement of the SMS

2. Safety risk management
    2.1 Hazard identification
    2.2 Safety risk assessment
    2.3 Safety risk mitigation
	4. Safety promotion
	    4.1 Training and education
	    4.2 Safety communication

Safety Policy and Objectives

1. Safety policy and objectives
    1.1 Management commitment
    1.2 Safety accountability and responsibilities
    1.3 Appointment of key safety personnel
    1.4 Coordination of emergency response planning
    1.5 SMS documentation
	Management commitment to safety
	
	And the foundational elements that support that commitment

2. Safety risk management
    2.1 Hazard identification
    2.2 Safety risk assessment
    2.3 Safety risk mitigation
	4.
	              education
	              unication

- Establishing your *Safety Policy and Objectives* is very important

Starting Your SMS Journey

- Establish a Goal
  - This should be what you want to achieve.
  - It should be tailored to your business structure.
    - If you make interiors parts, your goal should probably be a little more narrow than "to cause zero accidents."
    - A more useful goal for an interiors parts manufacturer might be "to prevent issues that contribute to unplanned maintenance for our customers"

- Establish Objectives
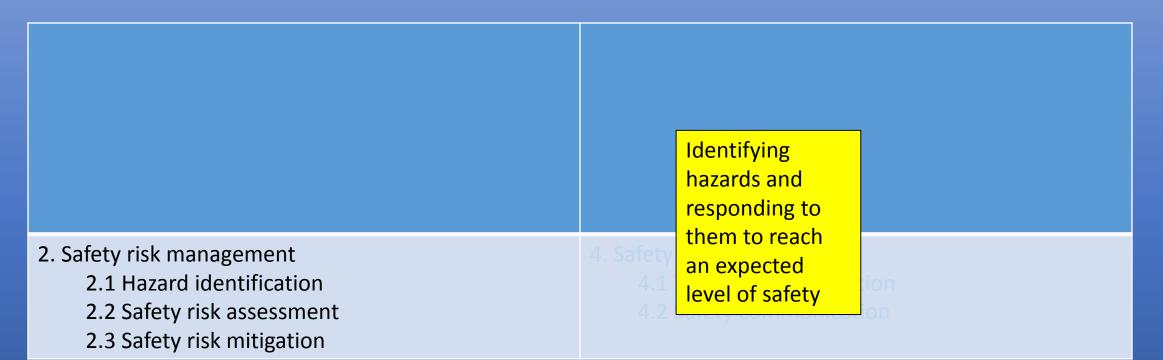
Support Your Goal With <u>Objectives</u>

- These should support the company in meeting the goal
  - If you identify that unplanned maintenance has been caused by shipping damage to parts, then one goal might be "to have zero shipping damage to parts"
- Make the goals realistic
  - If you have been experiencing shipping damage on an average of once per month, then it might be more realistic to set goals that respond to the safety risk assessment (*mitigate to an acceptable level*)
  - Don't be afraid to adjust your objectives to reflect reality as well as your aspirations
- Make the goals subject to measurement
  - If your goal is to reduce shipping damage, then you should be counting shipping damage incidents -- consider soliciting information from customers to make sure your counts are accurate and complete

Safety Risk Management

	Identifying hazards and responding to them to reach an expected level of safety

2. Safety risk management
    2.1 Hazard identification
    2.2 Safety risk assessment
    2.3 Safety risk mitigation	

- The formal approach of *Safety Risk Management* may be one of the most significant differences from a traditional quality assurance approach to safety

Safety Risk Assessment

- Applied to Shipping Damage
  - Identify the hazard(s) that caused the damage
  - Identify the likelihood and severity of each hazard
  - Identify a risk-product associated with each hazard
- If resources are limited, then you may use risk levels to prioritize the most important hazards

Using Mitigations to Reduce Risk

- How can we mitigate the most important hazards?

- You set mitigations to reduce risks of hazards
  - Typically, this means reducing the likelihood of the hazard or the severity of the hazard
  - In a shipping damage scenario, you might change carriers if you think that will reduce likelihood; you might modify the packaging to reduce severity

- FEEDBACK TO OBJECTIVES: What do we expect the mitigated count to be? This information can feed back to senior management to help set realistic goals for shipping damage reduction

Safety Risk Management Resources

- We've written extensively on safety risk management

- Check out the back issues of AVIATION MAINTENANCE MAGAZINE
  - https://www.avm-mag.com/category/legal-spin/
  - I wrote a seven-part series from 2020-2021 on implementing SMS with a special focus on the role of safety risk management

Safety Assurance

Auditing to ensure that the system works as expected and to improve the system
 	
Managing Change
	3. Safety assurance
	    3.1 Safety performance monitoring and measurement
	    3.2 The management of change
	    3.3 Continuous improvement of the SMS

2. Safety risk management
    2.1 Hazard identification
    2.2 Safety risk assessment
    2.3 Safety risk mitigation
	4. Safety promotion
	    4.1 Training and education
	    4.2 Safety communication

- Safety assurance can be influenced by the safety risk management program
- You may be able to rely on your existing quality audit system as a part of safety assurance (*don't be afraid to use what you already have!*)

Safety Assurance

- Audits or other safety assurance tools should ensure
  - Mitigation procedures are being followed
  - Mitigations are being accomplished properly
  - Mitigations are achieving the anticipated results
    - If a fully implemented mitigation is not achieving anticipated results, then the mitigation logic may be flawed, or the mitigation may be incorrectly implemented
- If audits reveal issues, then this data should help drive the next round of risk assessment and mitigation
  - E.g. an audit might reveal that packaging improvements have been made, but that these are not mitigating the severity of shipping damage; this suggests that additional investigation might be necessary

Safety Promotion

Using training and communication to reinforce the system

2. Safety risk management
   2.1 Hazard identification
   2.2 Safety risk assessment
   2.3 Safety risk mitigation

4. Safety promotion
   4.1 Training and education
   4.2 Safety communication

- Train everyone to understand the importance of the SMS system, and you might get unexpected useful data!

Change Management

- The hazard-risk records can become useful change management tools
- Planning to change a procedure?
  - Identify the hazards it mitigates in your records
  - Identify how the change could affect the underlying hazards
  - If the change affects the way that hazards are mitigated, then consider revising the anticipated change, or developing alternative mitigations, to reduce unintended consequences
- Be sure to use your *Safety Assurance* mechanisms to ensure that the change occurs with the expected results

Conclusions

- SMS is a tool for managing risk
- SMS is becoming a regulated system
- SMS can be used with your traditional quality system

- Think of it as an evolution of the way that we approach quality system analysis
- MARPA plans to support members who want to implement voluntary SMS programs

Questions?

Thank You

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