

SAFETY MANAGEMENT SYSTEMS

An FAA Update

Presented to: AGL Airports Conference

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Federal Aviation
Administration

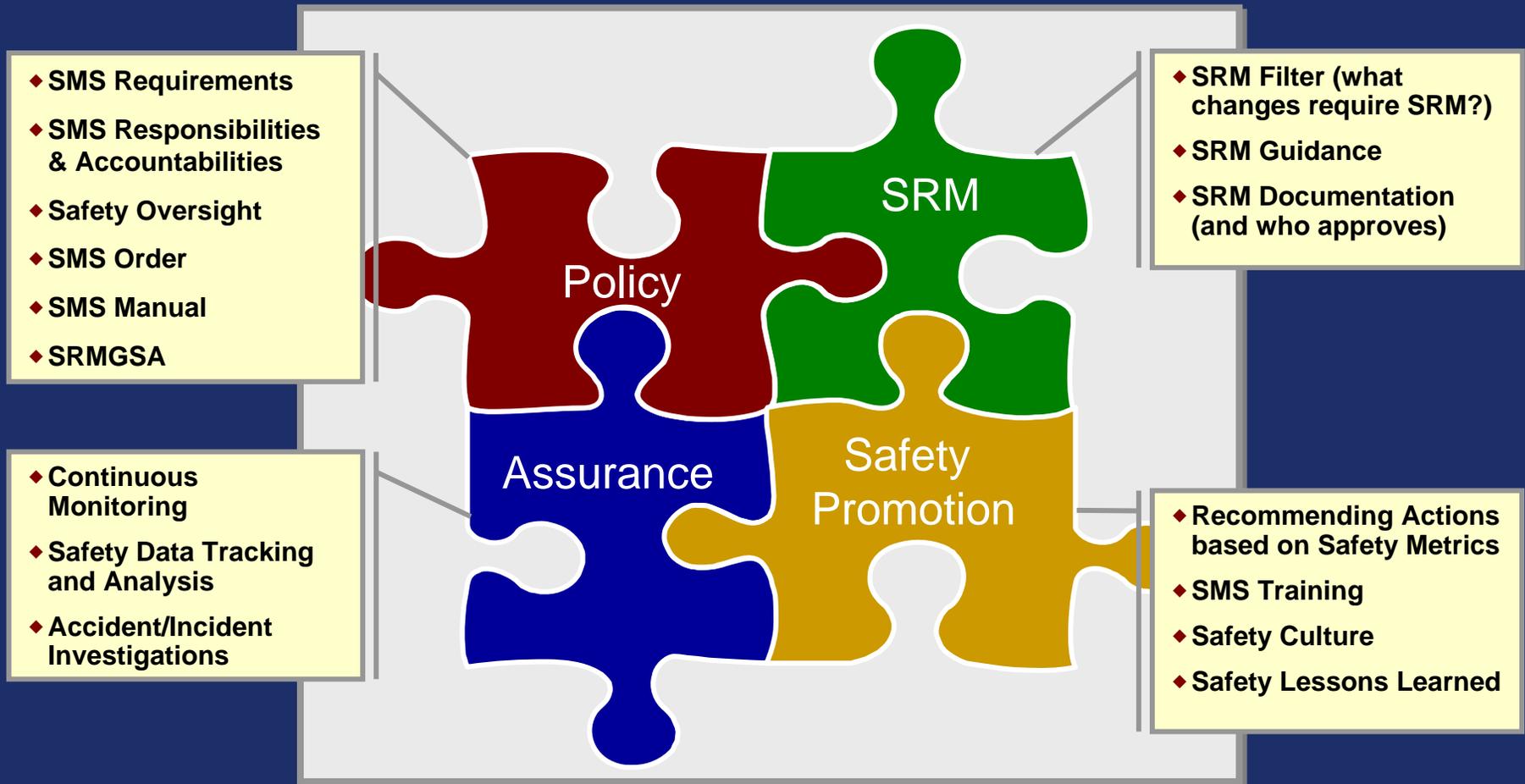


What is SMS?

- **ICAO Document 9859, Safety Management Manual**
- **“A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.”**



What is SMS?

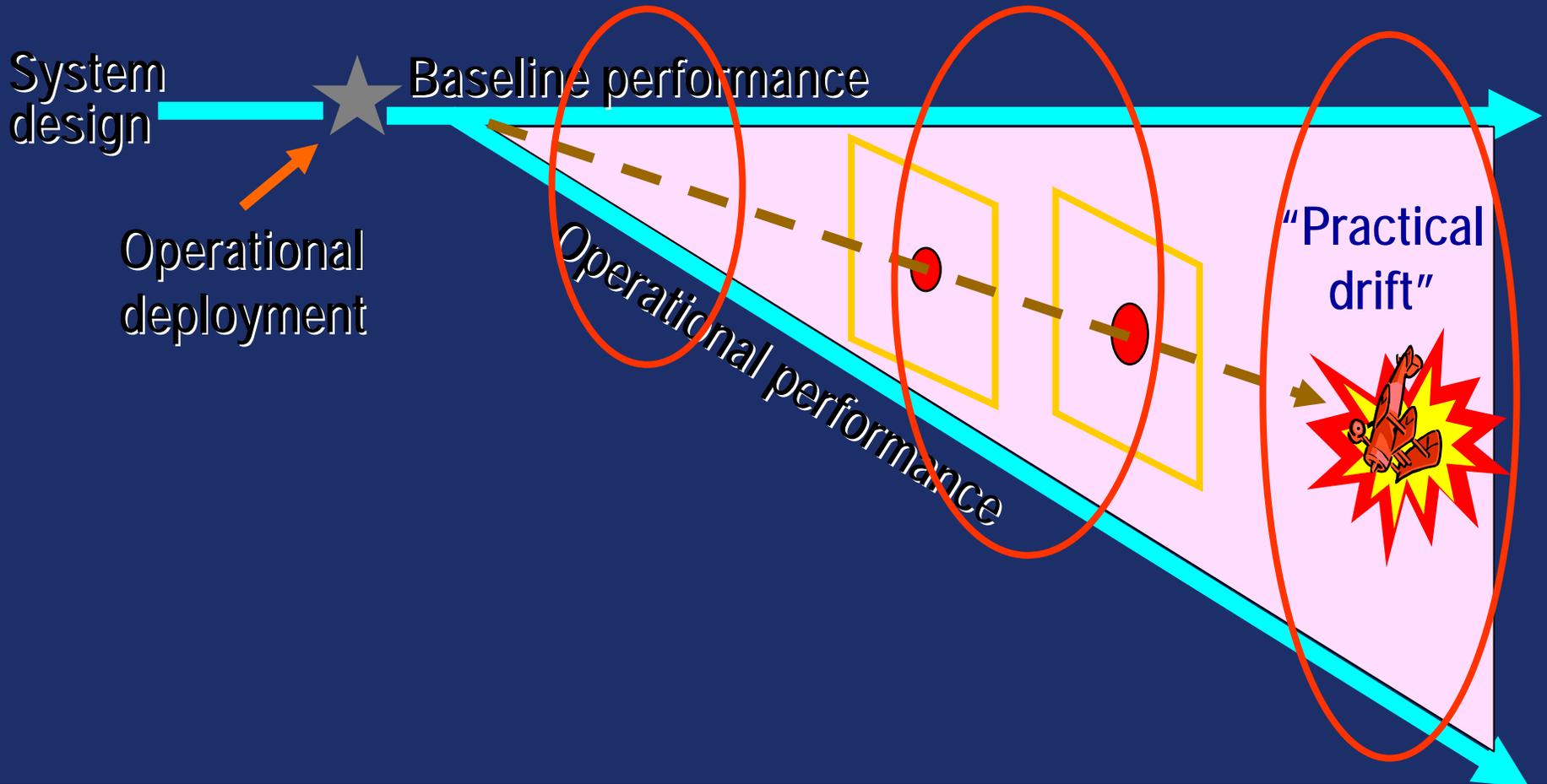


SMS Defined

- **FAA AC 150/5200-37, Introduction to SMS for Airport Operators.**
- **“The formal, business like approach to managing safety risk. It includes systematic procedures, practices, and policies for the management of safety (including safety policy, safety risk management, safety assurance, and safety promotion).”**



Why SMS? Because imperfection in a system is normal!



Why SMS?

- **Systems Safety**
 - Proactive vs. Reactive
 - Balance between safety and production
 - Future demands on the Air Transportation System
- **Proven Benefits**
 - Some pilot study airports have seen a reduction in insurance costs



SMS For Airports Evolution

- **ICAO Annex 14 Amended in November 2005**

“Annex 14, Volume 1, requires States to certify aerodromes used for international operations and recommends certification of aerodromes available for public use. The aerodrome certification process includes approval/acceptance of an aerodrome manual that outlines the aerodrome’s safety management system (SMS).” – *ICAO Safety Management Manual*

- **USOAP Audit Finding**
 - Mandatory Audit Item



ICAO SMS Programme Requirements Annex 14, Volume I



SMS at a minimum:

- Identifies safety hazards
- Ensures remedial action is taken
- Provides for continuous monitoring and assessments.
- Aims for continuous improvement.
- Establishes clearly defined roles and responsibilities.



How will US Meet SMS requirements?

- **Under today's Part 139 Rule**
 - Certification based on type of operations and aircraft
 - Issued Airport Operating Certificate
 - Required to develop and maintain an Airport Certification Manual which FAA approves
 - Some elements of SMS in rule (i.e. reporting/communication)
- **FAA will need to amend 14 CFR Part 139**



How will US Meet SMS requirements?

Rulemaking

- **Variety of airports certificated under Part 139**
 - Seattle-Tacoma International Airport (Class I AOC)
 - Lancaster Airport, Pennsylvania (Class II AOC)
 - Show Low Regional Airport, Arizona (Class III AOC)
 - Teterboro Airport, New Jersey (Class IV AOC)
- **Many airports are choosing to retain their AOC even after they lose air service**

How will US Meet SMS requirements?

Rulemaking

- **Scope/Scalability of SMS requirement under Part 139**
 - Some certificated airports have complex structure with hundreds of direct-report employees
 - Others have two full-time employees or less!
- **Practical Implementation**
 - Phased approach but what is considered reasonable

Steps Toward SMS Regulation

- **Published Advisory Circular 150/5200-37**
- **2 ACRP Projects**
 - ACRP 11-02: Safety Management Systems for Airports (Volume 1: Overview)
 - Guidebook for Developing Airport Safety Management Systems
- **Established 1st SMS Pilot Study for Airports**
 - Made AIP funds available for airports participating



Steps Toward SMS Regulation

Advisory Guidance

- **FAA Advisory Circular 150/5200-37**
 - Published Feb 28, 2007
 - Introduces SMS Concepts
 - Define SMS minimum requirements
 - Policy
 - Safety Risk Management
 - Safety Assurance
 - Safety Promotion



FAA AC SMS Guidance (AC150/5200-37)

- **Safety Policy and Objectives.**
 - Management commitment
 - Written safety policy, targets and goals.
 - Established roles and responsibilities.
- **Safety Risk Management Process**
 - Identify hazards and associated risks
 - Identify appropriate mitigation strategies
 - Plan, do, check, act (PDCA)
- **Safety Assurance System**
 - Validation of performance indicators and targets.
 - Non-punitive reporting system
 - Internal and external audits.
- **Safety Promotion Program.**
 - Training
 - Safety communications



Steps Toward SMS Regulation

TRB/ACRP Projects

•2 Projects with SMS focus

- ACRP 11-02: Safety Management Systems for Airports (Volume 1: Overview) – Explains SMS & how systems approach will benefit safety & business aspects of airport – Completed in 2007
- ACRP 04-05: Guidebook for Airport Safety Management Systems – How to develop and implement SMS with practical application to all certificated airports – In progress, 2009



Steps Toward SMS Regulation

SMS Pilot Studies

- **FAA initiated Airport SMS Pilot Studies**
 - Geared toward developing an SMS at a variety of certificated airports
- **Follow-on Airport SMS Pilot Study**
 - ‘Proof-of-concept’ at three airports who volunteered to implement SMS

Steps Toward SMS Regulation

Airport SMS Pilot Studies

- **20+ airports volunteered for 1st pilot study**
- **3 deliverables in 6 months if AIP funded**
 - GAP analysis
 - Draft Program and Implementation Plan
 - Final Program and Implementation Plan
- **Completed 1st study in July 2008**



Steps Toward SMS Regulation

Airport SMS Pilot Studies

- **1st Pilot Study was top heavy with Class I Airports**
- **Opened 2nd Pilot Study to only Class II, III, and IV Airports**
 - Same deliverables
 - Same time frames
 - Same AIP eligibility
- **Airport selection & funding in August 2008**

Steps Toward SMS Regulation

Airport SMS Pilot Studies

- **FAA will analyze deliverables from pilot studies**
- **Final Report (1st study) to be issued at AAAE/ACI-NA/MITRE SMS Workshop in Baltimore on October 30**



Steps Toward SMS Regulation

Follow-On Pilot Study

- **Proof-of-Concept Follow-On Pilot Study to ‘prove’ out SMS Manual and implementation at three airports (large, medium, small operations)**
- **Airport participating**
 - Seattle-Tacoma
 - South Bend
 - Concord, NC

Steps Toward SMS Regulation

Follow-On Pilot Study

- **Looking at proving elements of:**
 - Safety Policy
 - Safety Risk Management
 - Safety Assurance

- **Duration of Pilot – 1 year with monthly reporting**

**OFFICE OF AIRPORT SAFETY AND STANDARDS
AIRPORT CERTIFICATION PROGRAM**

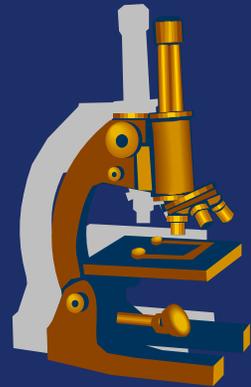


**SAFETY MANAGEMENT SYSTEM
PILOT STUDY
PARTICIPANT GUIDE
MARCH 1, 2007**



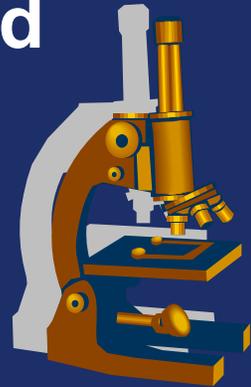
Study Methodology

- **22 airports participated.**
- **Goals:**
 - Identify how well 14CFR part139 meets or exceeds the requirements of SMS
 - Review existing programs/processes for functioning elements of SMS.
 - Identify and quantify costs associated with implementation.
 - Develop a Safety Program Manual
 - Implement full SMS functions in at least one department.



Study Methodology

- The ‘four pillars’ approach was the dominant format.
- Wide variations in conduct of ‘gap analysis’ and in format of SPM.
- Inherent SMS bias evident in results.
- Attempts made to standardize responses so that program submissions/answers could be categorized and counted.



Small Airport Operators

- Findings indicated a lack of information related to 'smaller' airports (Class IV).
- Recommendation made regarding second pilot project.
- Pilot Project II initiated July 2008...8 Class IV airports participating.



Talladega, AL (ASN)

Gap Analysis Review

-Goal/Purpose: Systematic effort to determine:

- Which components/elements of SMS may already exist
- Which existing SMS program elements may need to be modified.
- Which normally accepted elements of SMS are missing.

-Different approaches taken in completion of Gap Analysis.



Gap Analysis Review

- Attempt to categorize responses in standardized manner:
 - **Policy** 10 categorical questions
 - **SRM** 7 categorical questions
 - **Assurance** 5 categorical questions
 - **Promotion** 7 categorical questions
 - **Miscellaneous** 2 categorical questions
- Data analyzed in terms of these 31 categorical responses.
- If response could not be determined then airport was not counted in that category (yes or no).

Gap Analysis Responses

- **Does the airport have an existing SMS?**
 - 17 answers / 1 yes / 16 no 5.9 % yes
- **Is management committed to the goal of safety enhancement through application of SMS?**
 - 12 answers / 11 yes / 1 no 8.3 % yes
- **Does the airport have written safety policy that would meet the intent of SMS?**
 - 19 answers / 9 yes / 10 no 47.3 % yes

Gap Analysis Summary

- Support of SMS
- Management commitment
- Support of non-punitive reporting
- Training needs identified.
- Existing safety culture could support SMS implementation.
- Existing SMS
- Safety policies communicated
- Existing SRM process
- Internal/external safety audit
- Goals, targets, indicators
- Non-punitive reporting
- SMS training
- Data collection inadequate

Plan Review 'Format'

- Best examples followed a structured approach
- Best examples followed the 'four-pillars' structure to develop their program and their SPM.
- All attempted to structure format to fit organizational needs.
- If FAA moves ahead with regulatory requirement there may be some value to a more standardized SPM format.



Plan Review

'SMS vs. 139'

- Apparent that 139 is not SMS in and of itself...
- Evidence that SMS is something larger, more comprehensive, than is currently found in the act of complying with 139 requirements.
- Clear that compliance with Federal Regulations does not ensure a safe system...nor does regulatory compliance establish a functioning SMS
- Evidence that 139 compliance may eventually become part of airport SMS program...contrary to the idea that SMS would eventually become part of 139.

Plan Review

'Program Integration'

- Most identified need to address 139 as part of the SMS.
- Reference made to the idea that SMS could be used to ensure 139 compliance...but that 139 by itself could not ensure that SMS was functioning.
- Several attempted to dissect 139 to assign each part to a corresponding SMS functional area.
- Some indication that it will take effort to ensure congruency between SMS and 139.
- Some attempted to integrate tenant activities.
- Reference made to integration through infusion of SMS

Plan Review

'Policy Statement'

- Most provided written policy statement in their plans.
- Some were very simple...others (most) more complicated.
- Best statements:
 - Written & signed at the top level of the organization
 - Expressed commitment to continuous improvement
 - Integrated all parties in organization to the same goal(s)
 - Promised open, continuous safety communications
 - Promised implementation of all elements of SMS
 - Dedicated airport to create environment that minimized hazards.
- Many addressed ALARP...one shooting for zero accidents

Plan Review

‘Assignment of Responsibilities’

- All plans addressed assignment of responsibilities
- A few tried to define responsibilities and commitment at levels above immediate airport organization.
- Size of organization dramatically affected responsibilities.
- All identified the one person in control of SMS.
- Not all addressed the level of financial/HR control of that person.
- Accountable Executive vs. other titles.

Plan Review

‘Acknowledgement of Accountabilities’

- Not all plans addressed accountability for safety performance and actions.
- Plans that properly addressed accountabilities tended to be broader in scope and somewhat more detailed.
- Some evidence that later stages of implementation will more likely see greater emphasis on accountability.

Plan Review

'SMS/Safety Organization'

- All plans established a formal safety organization.
- Wide variances in organization and titles used.
- Small airports tended to assign responsibilities as collateral duty.
- Larger airports tended to assign/develop new positions.
- Some established 'steering committees' or similar groups.
- Many established (or restarted) safety committees.
- Best examples provided detailed descriptions of responsibilities, yet provided sufficient latitude and flexibility for safety response.

Plan Review

‘Support for SMS, Non-Punitive Reporting, Continuous Improvement...’

- Wide variance in documented support.
- Documented support for continuous improvement the most elusive.
- One excellent example plan referred to support for continuous improvement as a “moral obligation”.
- Several addressed NPR system in detail leaving little doubt about their level of support for NPR.

Plan Review

'SRM Process & Application'

- All addressed safety risk management (SRM).
- Some continuity in responses (IAW AC150/5200-37).
- Differences found in level of authority responsible for SRM process.
- Best plans:
 - Developed guidance as to when to perform SRM.
 - Implemented continuous, self-monitoring processes to ID hazards.
 - Consolidated responsibility for SRM (at least in initial phases).
 - Defined administrative process for SRM.
 - Discussed management responsibility for tracking, mitigation and ownership of risks and hazards.
 - Addressed use and maintenance of safety data.

Plan Review

‘Goals, Targets and Objectives...’

- Wide variance found here
- Most tied initial goals/targets/objectives to implementation.
- Evidence that initially a systems structure would need to be established, then a safety baseline defined...before goals/targets/objectives could be set.
- One airport established ‘8’ primary goals, each with corresponding performance objectives, all tied to implementation.

Plan Review 'Auditing'

- Variance in that a few established continuous planned audit programs...while at least one felt that audits should be the “exception rather than the rule”.
- Most tied auditing to continuous improvement.
- Most at least tried to define both internal and external audit requirements.
- Some evidence that the idea of auditing is still misunderstood (i.e. overemphasis and overreliance of 139 program elements).



Plan Review 'Safety Data'

- As SMS data does not yet exist...many proposals for database systems were theoretical in nature.
- Many indicated an initial use of paper records for SMS efforts.
- Some developed special forms and records to use.
- Several discussed implementation of dedicated safety databases.
- One discussed third party involvement for data collection, maintenance, and analysis.

Plan Review

'Indoctrination & Training'

- Addressed by all participants...some concentrated on existing '139' training programs.
- All acknowledged SMS requirements and many tried to integrate programs.
- One good example addressed:
 - Policy and objectives
 - Training development, documentation, measurement, feedback and revision.
 - Indoctrination and job specific training requirements.
 - Specific SMS training requirements...including SMS skills training for managers.
 - Documentation requirements and procedures to measure training effectiveness.

Plan Review

‘Safety Communications’

- Well developed proposals...topic/requirement adequately addressed by most.
- Some consistency between participants.
- Training programs integral to communications process.
- Centralized communications effort by most.
- Communications conduit assigned by most.



Plan Review

‘Safety Communications’

Proposed Program Elements:

- Suggestion program
- Safety bulletins
- Committee minutes
- Newsletters
- Safety reports
- Safety Summaries
- Ramp campaign
- Solicitation of feedback
- Safety contests
- Safety database
- Safety literature
- Website
- Rewards/recognition program
- Safety courses
- Promotional campaigns



Plan Review

‘Non-Punitive Reporting’

- Addressed by all participants.
- A few addressed NPR as a ‘future need’...a few established NPR reporting systems and written guidance.
- All acknowledged confidentiality...most addressed issues associated with anonymity.
- ‘Best Practice’ program elements:
 - Confidentiality & protection.
 - Reporting instructions & process.
 - Limitations addressed.
 - Tied to ‘just’ safety culture.
 - Reactive and proactive use.
 - Review process.
 - Feedback ensured.
 - Connection to safety database.

Plan Review 'Miscellaneous'

- Establishment of safety committee: 87%
- Establishment of additional committees/groups: 13%
- Airports that used 'Accountable Executive' title: 33%
- Additional duty positions associated with SMS: 20%
- Identification of SMS lead position: 73%
- New forms, tables, data tools etc.: 66%



Implementation Schedule

- Scant data provided
- Years...not months
- Phased implementation seemed universally accepted
- Program suggested by most seemed revolutionary and evolutionary...thus significant time would be required to fully implement.
- Considerable evidence that implementation schedule will vary by complexity and size of airport.



Implementation Costs

- Scant data provided.
- Some hinted at significant costs associated with program implementation and development. One cost figure provided...\$968,960.00
- Others hinted that most program elements already exist 'in-house' and that program could be developed with minimal impact to financial system. One cost figure indicated that only additional costs would be for database procurement and installation.
- One indicated inability to quantify costs associated with SMS effort by existing airport staff.



Recommendations

- Need for SMS
- Integration of SMS with 14 CFR part 139
- SMS by complexity and size of organization
- Program recommendations
- NPRM recommendation
- Advisory Circular guidance



What's next?

- **Moving our rulemaking project along to its next phase**
- **Issuing NPRM**
- **Rulemaking within next 3 years**
 - Update AC 150/5200-37
 - Provide any additional guidance for compliance
 - Train FAA inspector cadre on SMS requirements



Other SMS Initiatives

- **FAA is committed to implementing SMS internally!**
- **ATO SMS is operational**
 - Certain airport projects will trigger ATO to conduct risk analyses
- **AVS/ARP/AST SMS is in development**
 - Expect to start seeing SRM integrated into FAA approval process for new airport projects



Other SMS Initiatives

- **ARP's SMS Order under development**
 - Regional review August 2008
 - Ready for signature early 2009
- **ATO SRM Participation NOW**
 - Interim guidance while Order under development
- **FAA SMS Order in review**
- **AVS SMS under development**
 - Looking toward integrated approach

QUESTIONS?

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