

Practical AI in Aviation SMS

Elevating Safety Management & Proactive Risk
Intelligence for Part 135 Leadership



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**Federal Aviation
Administration**

The Small Operator Dilemma

Uncompromising Safety Standards

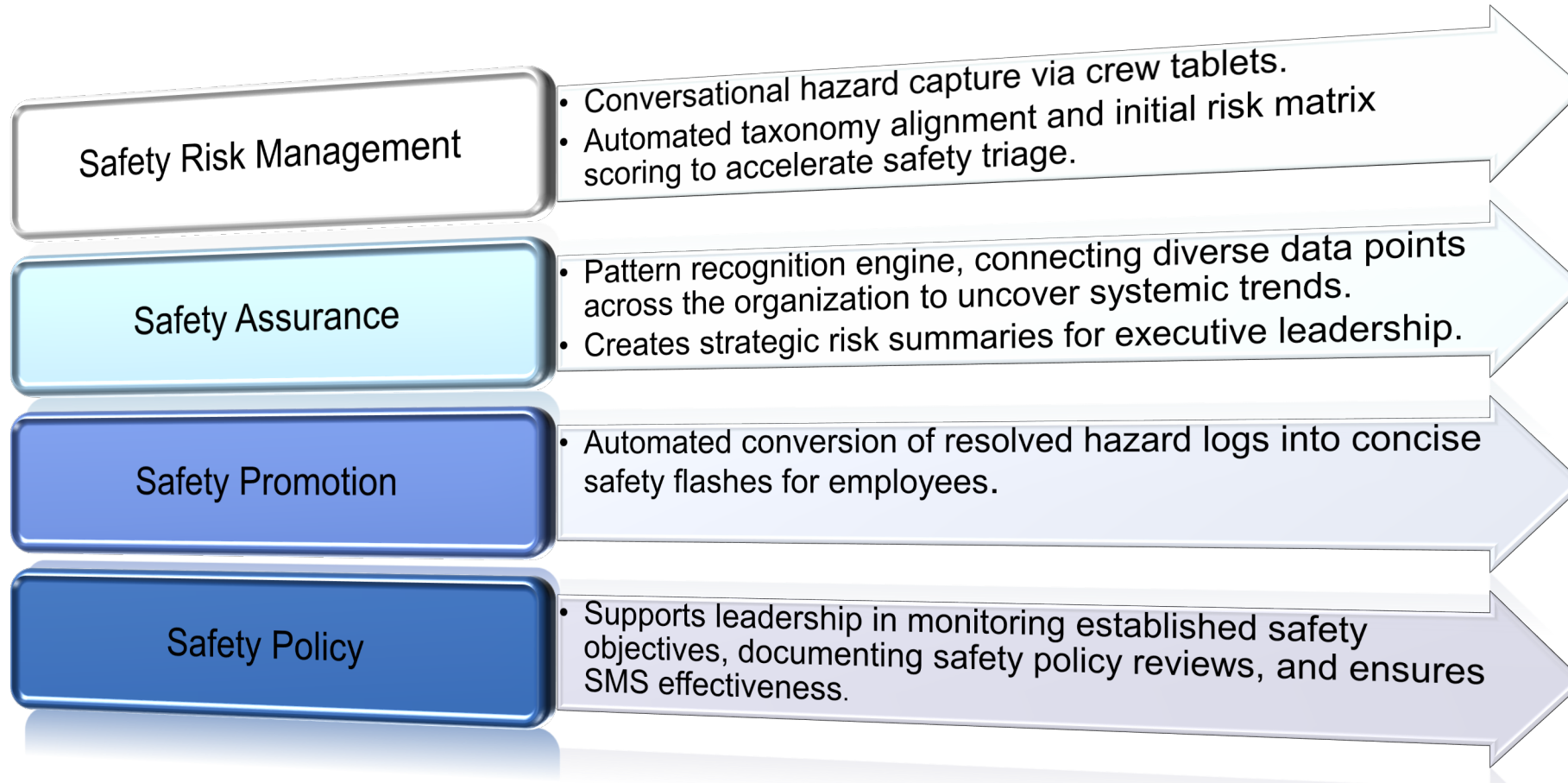
- FAA Part 135 SMS mandate demands comprehensive risk tracking regardless of fleet size.
- Small operators must demonstrate robust safety oversight without dedicated safety departments.
- Challenge: Safety leaders must balance flight ops with heavy administrative processing, limiting time for active risk management.

Hidden Operational Hazards

- Complex reporting portals create friction, discouraging flight crews from reporting minor issues.
- Weak safety signals remain invisible until they manifest as incidents.
- Safety Impact: Latent risks remain unmitigated when safety managers are constrained by manual data management.



AI-Enhanced Safety Architecture



Empowering Hazard Identification

Simplified Hazard Reporting

- Natural Conversational Input: Pilots & ground crews record brief voice notes on mobile devices, eliminating form navigation.
- Standardized Taxonomy: AI extracts key operational context and aligns submittals with ICAO/FAA taxonomy.
- Rapid Risk Scoring: Automatically populates severity and likelihood indicators for faster safety triage.

Intelligent Intake Process

1. Audio Submittal:
 - *"Ramp vehicle cut off N123AB at KTEB..."*
2. Context Extraction:
 - *Category: Ground Safety | ICAO: RAMVR*
3. Matrix Indexing:
 - *Likelihood: Probable | Severity: Minor -> Pre-indexed for triage*

Safety Assurance & Proactive Intelligence

Centralizing Safety Intelligence

- Small operators generate safety signals across flight logs, audit findings, and maintenance reports.
- AI retrieval engines search across all unstructured files simultaneously.
- Transforms static document archives into an active, searchable safety intelligence repository.

Plain Language Safety Queries

- **Leadership Inquiry:**
"Have we observed recurring operational issues at non-towered airports during night arrivals over the past year?"
- **AI Risk Synthesis:**
Correlates historical hazard logs, audit items, and crew notes to highlight specific ramp lighting and traffic patterns instantly.

Safety Promotion & Safety Culture

Closing Feedback Loop

- AI translates technical risk mitigations into actionable safety flashes distributed directly to electronic tablets.
- Builds trust and active reporting engagement by showing crews that submittals lead to tangible safety improvements.

Enhanced Learning

- Improve learning outcomes by leveraging AI to efficiently develop and revise training products.
- Deliver on-demand learning precisely when needed, resulting in a more efficient and relevant training experience.

Safety Policy & SMS Maturity

Safety Policy

- Safety objectives are dynamic and are modified as necessary to reflect current needs based on safety performance assessment.
- Defines safety authority and accountability and fosters a culture where safety is everyone's responsibility.

Continuous Improvement

- Enhanced data inputs and outputs facilitate ongoing evaluation of safety performance, SMS effectiveness, and opportunities for improvement.
- Maintain consistent approach to managing safety risks and actively address emerging issues

Transforming Safety Management

Safety Management Step	SMS Process	AI-Augmented Safety Process	Safety Advantage
1. Hazard Submittal	Complex web forms completed post-duty	Rapid voice submittal on crew tablet	High Data Capture
2. Triage & Tagging	Manual taxonomy entry & delayed indexing	Automated context extraction & pre-scoring	Instant Triage
3. Risk Discovery	Manual spreadsheet review across folders	Natural language querying across all logs	Proactive Insight
4. Executive Oversight	Periodic manual compilation of meeting slides	Automated strategic risk dashboards	Clear Visibility

Practical Implementation Roadmap

Phase 1: Crawl

Immediate Capability:

Utilize secure enterprise AI tools to draft safety bulletins, summarize incident trends, and format regulatory responses with human oversight.

Phase 2: Walk

SMS Integration:

Activate native AI modules within existing SMS platforms for voice-assisted reporting and automated taxonomy tagging.

Phase 3: Run

Predictive Risk Insights:

Link safety database trends directly with flight scheduling and dispatch workflows for real-time risk profiling prior to flight release.

The Executive Bottom Line

Defensibility & Audit Readiness

- Provides complete, time-stamped proof of safety management for regulatory inspectors & underwriters with standardized taxonomy and closed loops.

Proactive Risk Prevention

- Surfaces subtle risk patterns early across scattered operational reports, allowing leadership to implement targeted mitigations before incidents occur

Active Safety Culture

- Eliminating reporting hurdles encourages active participation across crews and line staff, fostering a transparent, feedback-driven environment.

Questions & Discussion

Thank you for your time. Let's discuss your operation's safety management goals.

Data Privacy & Security

FAA Alignment & Oversight

SMS Software Integration