



NTSB National Transportation Safety Board

SMS: What is it anyway?

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- Cessna 310 owned by NASCAR
- Flight planned Daytona Beach to Lakeland
- Inflight emergency, request for immediate diversion, crash
- 5 fatalities

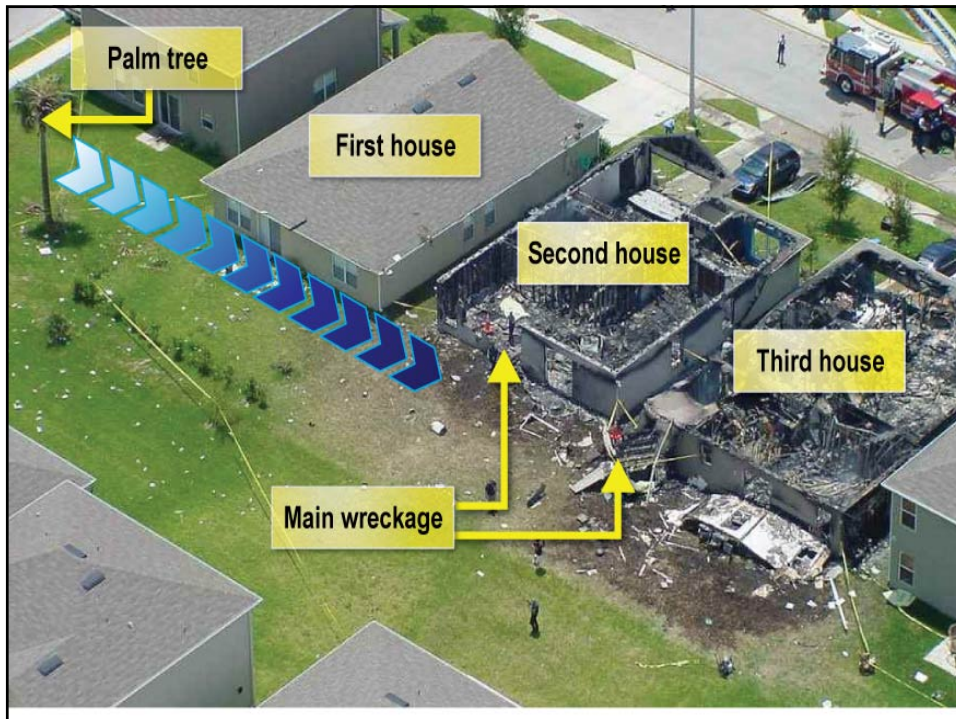
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Declared Emergency

“Smoke in the cockpit.”

“Shutting off radios, elec.”



Pilots

- Left seat, PIC
 - NASCAR medical officer
 - Commercial Pilot Certificate
 - 276 total flight hours
- Right seat
 - Full time NASCAR pilot
 - ATP
 - 10,580 total flight hours



Maintenance Discrepancy Entry

AIRCRAFT: N501N	DATE: 07-09-07	-ACTT	
MAINTENANCE WRITE-UP		MAINTENANCE CLEARING ACTION	
Entered By: ACT	Location: DAD	<input type="checkbox"/> Repaired	<input type="checkbox"/> Replaced
		<input type="checkbox"/> Released- Could Not Duplicate	<input type="checkbox"/> Loaner Installed
RADAR WENT BLANK DURING CRUISE FLIGHT. RECYCLED - NO RESPONSE... SMELL OF ELECTRICAL COMPONENTS BURNING TURNED OFF UNIT - PULLED RADAR CB - SMELL WENT AWAY. - RADAR INOP		Corrective Action:	

“SMELL OF ELECTRICAL COMPONENTS BURNING”

Events - Previous Day

- Pilot followed company procedures
 - White original in airplane binder
 - Verbally informed technician
 - Handed yellow copy to DOM
- Brief in-office discussion
- Airplane not inspected, modified, or grounded
- Airplane remained available for flight



Events - Accident Day

- Maintenance technician did not examine binder or airplane
- ATP dismissed radar issue as unimportant
- Pilots accepted airplane “as is”
- Weather radar circuit breaker likely reset for the flight



Organizational Processes

- Limited grounding authority
- Forms not serialized, tracked, or retained
 - Yellow copy never provided
- SOP guidance versus reality
- No assurance discrepancies would be addressed
- Airworthiness status unclear



Synopsis

- Sufficient information available to all pertinent personnel
- Release and acceptance contrary to FARs and NASCAR SOPs
- Intervention opportunities ignored or circumvented



NTSB Finding

“Safety Management System programs would provide corporate flight departments a formal system of risk management, safety methods, and internal oversight programs that could improve safety.”



Probable Cause

- Actions and decisions by NASCAR's corporate aviation division's management and maintenance personnel to allow the accident airplane to be released for flight with a known and unresolved discrepancy, and;
- The accident pilots' decision to operate the airplane with that known discrepancy, a discrepancy that likely resulted in an in-flight fire.



NTSB Recommendation to FAA

Develop a safety alert for operators encouraging all Part 91 business operators to adopt Safety Management System programs that include sound risk management practices.

– NTSB Recommendation A-09-16



NTSB Recommendation to FAA

Require that all Part 121 operators establish Safety Management System programs.

– NTSB Recommendation A-07-10



What is a Safety Management System?

“A SMS is an organized approach to managing safety, including the necessary organizational structures, accountabilities, policies, and procedures.”

– ICAO (Doc 9859 SMM)



When you have SMS, the company ...

- Systematically attends to those things it believes are important.
- Manages and values safety, just as they manage and value other vital business functions.
 - **Manufacturing:** Quality Control, ensuring products are produced within certain tolerances, standards
 - **Finance:** CFO, General Accepted Accounting Practices (GAAP), procedures, controls, audits, accountability



SMS Components

1. Written policies, procedures and guidelines
2. Data collection and analysis
3. Risk management
4. Safety culture



SMS Components

- 1. Written policies, procedures, guidelines**



Potential Gaps

- The organization does not have adequate written policies, procedures and guidelines.
 - or –
- They don't rigorously adhere to what they do have.



Inadequate Procedures



Inadequate Procedures

- No specific procedure for the director of maintenance to communicate maintenance status of an aircraft to anyone else within NASCAR.
- No procedures for providing flight operations personnel (pilots and dispatchers) with airplane airworthiness information.



Inadequate Procedures

- Most often a preflight fact sheet would be taped to airplane with highlighted items signed off by a mechanic
- Not a requirement, not spelled out in SOP
- No guidance was provided to PIC for determining airworthiness of assigned aircraft



Non-Compliance



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Non-Compliance

- Aviation director could not readily locate SOP manual
- SOP manual viewed as a “training tool.”
- Aircraft to only be used for company business
 - Accident flight was a personal flight
- PIC must possess ATP
 - PIC did not possess ATP
- Last 3 maintenance discrepancies had not been addressed

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SMS Components

2. Data collection and analysis



Data collection and analysis

- How do you keep your finger on the pulse of your operations?
- Are you taking proactive measures to protect your employees and passengers?
- Do you have multiple data sources?



Data leads to informed Risk Management

- “Hazards and incidents resulting from department operations shall be identified at all levels.
- “Conditions and acts posing unacceptable risk shall be eliminated or changed to prevent personal injury or illness and property damage or loss.”

– NBAA Prototypical Safety Manual



SMS Components

3. Risk Management



Risk Management

“We manage risk whenever we modify the way we do something to make our chances of success as great as possible, while making our chances of failure, injury or loss as small as possible.”

– FAA System Safety Handbook



Step 1: Identify Hazards



HAZARDS

- No precision approach
- No operational tower



Flight Safety Foundation
ALAR
 Approach-and-landing Accident Reduction
Tool Kit

Approach-and-landing Risk Awareness Tool

Airport Services and Equipment

No approach radar service or airport tower service.....	⚠️⚠️⚠️
No current local weather report.....	⚠️⚠️
Unfamiliar airport or unfamiliar procedures.....	⚠️⚠️
Minimal or no approach lights or runway lights.....	⚠️
No visual approach-slope guidance — e.g., VASI/PAPI.....	⚠️
Foreign destination — possible communication/language problems.....	⚠️

Expected Approach

Nonprecision approach — especially with step-down procedure or circling procedure.....	⚠️⚠️⚠️
Visual approach in darkness.....	⚠️⚠️
Late runway change.....	⚠️⚠️
No published STAR.....	⚠️

Step 2: Assess Hazards

		PROBABILITY			
		Unlikely	Seldom	Occasional	Likely
S E V E R E T Y	Catastrophic	3	4	4	4
	Critical	1	2	3	4
	Marginal	1	1	2	3
	Negligible	1	1	2	2

Hazard

No precision approach
 No operational tower

RAC

3 (Seldom, Catastrophic)
 3 (Seldom, Catastrophic)

Step 3: Make Risk Decisions & Develop Controls



- Develop risk control options, then decide if benefits outweighs risk.

Step 3: Make Risk Decisions & Develop Controls

HAZARDS

- No precision approach
- No operational tower

CONTROLS

We will not use this airport:

- between sunset and sunrise when control tower is closed, and
- when the weather is forecast below 800/2.



Determining Residual Risk

		PROBABILITY			
		Unlikely	Seldom	Occasional	Likely
S E V E R I T Y	Catastrophic	2	3	4	4
	Critical	1	2	3	4
	Marginal	1	1	2	3
	Negligible	1	1	2	2

Hazard

No precision approach
No operational tower

RAC

1 (Unlikely, Negligible)
1 (Unlikely, Negligible)

SMS Components

4. Safety Culture



Safety Culture

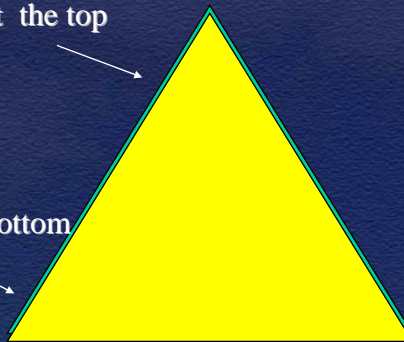
Do employees do the right things,
even when no one is watching.



Corporate Culture is:

Triggered at the top

Measured at the bottom



Corporate culture starts at the top of the organization and
permeates the entire organization.

SMS Components

1. Written policies, procedures and guidelines
2. Data collection and analysis
3. Risk management
4. Safety culture



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