



**NTSB** National Transportation Safety Board

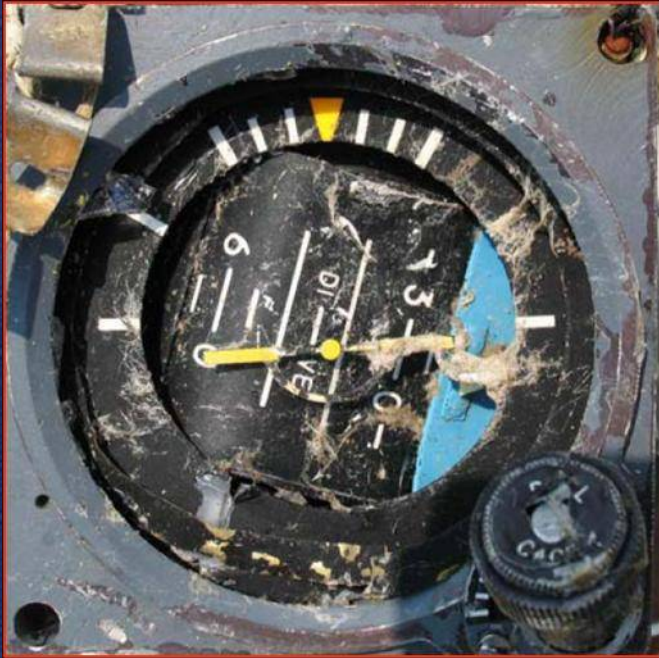
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# **A Practical Look at Developing and Maintaining a Safety Culture**

Robert Sumwalt

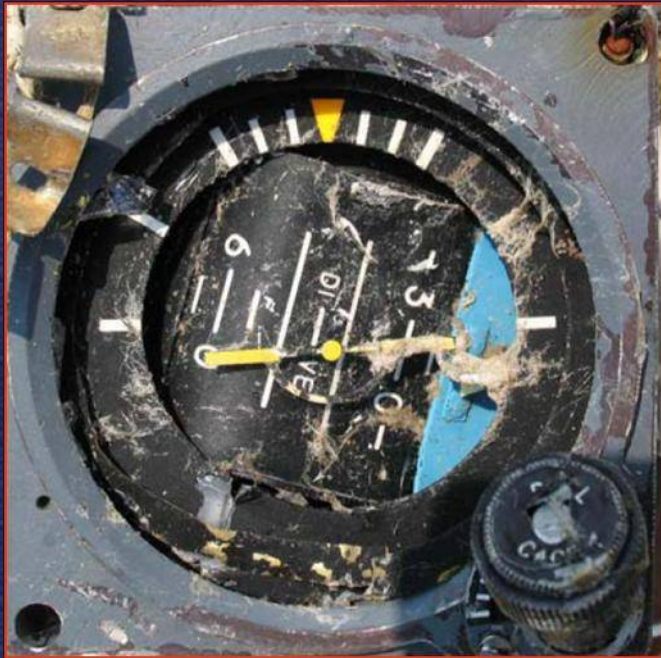
November 3, 2009

# Safety Culture



Do you have  
the right attitude?

June 4, 2007





# What the investigation found

## Captain/chief pilot/check airman

- had prior certificate revocation
- routinely failed to comply with procedures and regulations
- falsified training records

## Marlin Air

- had financial difficulties
- did not ensure those who operated their aircraft were properly trained.

# NTSB Finding

- “Marlin Air’s selection of the accident captain (who routinely failed to comply with procedures and regulations) to the positions of company chief pilot and check airman, with responsibility for supervision and training of all company pilots, contributed to an inadequate company safety culture that allowed an ill-prepared first officer to fly in Part 135 operations.”

# NTSB Finding

- “Marlin Air’s selection of the accident captain (who routinely failed to comply with procedures and regulations) to the positions of company chief pilot and check airman, with responsibility for supervision and training of all company pilots, contributed to an inadequate company safety culture that allowed an ill-prepared first officer to fly in Part 135 operations.”

**Do you have a good safety culture?**



# Do you have a good safety culture?

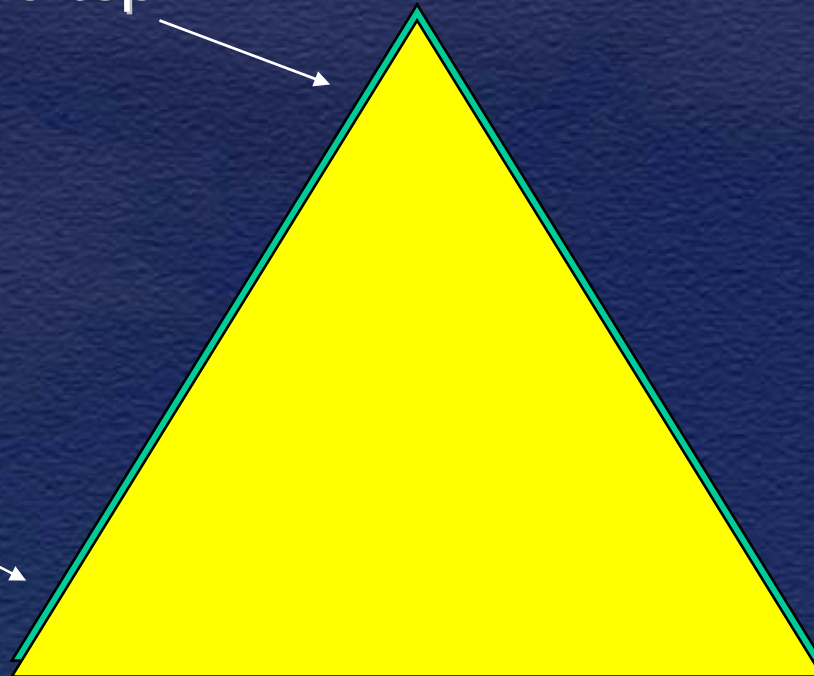
- “... it is worth pointing out that if you are convinced that your organization has a good safety culture, you are almost certainly mistaken.”
- “... a safety culture is something that is striven for but rarely attained...”
- “...the process is more important than the product.”
  - James Reason, “Managing the Risks of Organizational Accidents.”

# Safety Culture is:

Triggered at the top



Measured at the  
bottom



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

# Safety Culture




Doing the right things, even when no one is watching.

# Roadmap to Safety Culture

1. Management Commitment and Emphasis
2. Standardization and Discipline
3. Training
4. Data Collection and Quality Assurance Programs

# Roadmap to Safety Culture

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# Roadmap to Safety Culture

1. Management commitment and emphasis on safety
  - Safety begins at top of organization
  - Safety permeates the entire operation

# July 10, 2007, Sanford, Florida



- Cessna 310 owned by NASCAR
- 5 fatalities







Declared Emergency

“Smoke in the cockpit.”

“Shutting off radios, elec.”





# Maintenance Discrepancy Entry

AIRCRAFT: N561N	DATE: 07-09-07	-ACTT	
		-ACTL	
MAINTENANCE WRITE-UP		MAINTENANCE CLEARING ACTION	
Entered By: ACT	Location: DAB	<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		Corrective Action:	
TURNED OFF UNIT - PULLED RADAR C.B. - SMELL WENT AWAY. -			
RADAR INOP			

**“SMELL OF ELECTRICAL COMPONENTS BURNING”**



# Events - Previous Day

- That pilot followed company procedures
  - White original log sheet left in airplane binder
  - Handed yellow copy to Director of Maintenance
  - Verbally informed technician
- 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
- One pilot dismissed radar issue as unimportant
- Pilots accepted airplane “as is”
- Weather radar circuit breaker likely reset for the flight

# Organizational Processes

- Maintenance forms not serialized, tracked, or retained
  - Yellow copy never provided
- No assurance discrepancies would be addressed
- 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

# Culture of Non-Compliance


- Aviation director could not readily locate SOP manual
- SOP guidance versus reality
  - Aircraft to only be used for company business
    - Accident flight was a personal flight
  - PIC must possess Airline Transport Pilot (ATP) certificate
    - PIC did not possess ATP
- Last 3 maintenance discrepancies had not been addressed

# NTSB 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.”



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# Standardization and Discipline

## Standardization and discipline

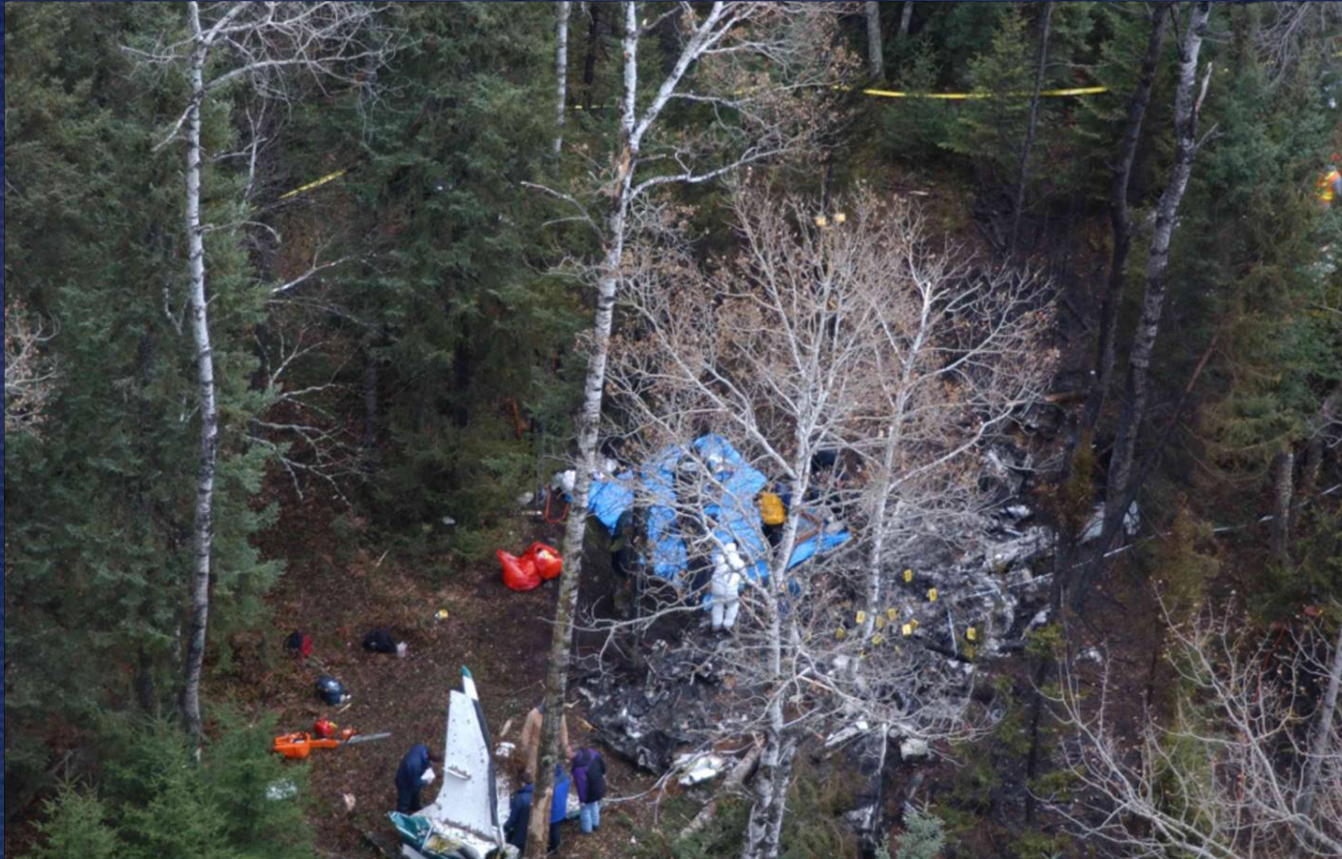
- Management stresses need for these items
- Cockpit procedural compliance, callouts, and checklist usage are tightly controlled.

**“When asked about the flight department's standard operating procedures (SOPs), the chief pilot advised that they did not have any...”**



**“... the flight department had started out as just one pilot and one airplane, and that they now had five pilots and two airplanes...”**

# October 25, 2002



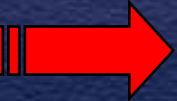
# Standardization

- Maneuvers Guide – contained key procedures for briefing and conducting instrument approaches
  - Pilots were expected to adhere to procedures in Maneuvers Guide
  - Maneuvers Guide was only issued to the chief pilot and instructors

# Standardization

- Company check airman: rated company's standardization as "6" (1-10 scale)
- Company pilot: "Fair to good"
- Lead ground instructor: "Fair"
  - Suspected that some pilots were following SOPs while others were not
  - Aware that some pilots used their own checklists, instead of company checklists
- Another pilot: never seen any standardized callouts documented in any company manual
  - To compensate, she used callouts she used at another company

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# Roadmap to Safety Culture

## 3. Training

- Strong commitment to training and provide oversight of their training
- Ensure training standardization and discipline are maintained



# Air Midwest 5481

# Jan 8, 2003



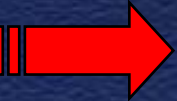
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# Air Midwest 5481

- “Air Midwest did not have maintenance training policies and procedures in place to ensure that each of its maintenance stations had an effective on-the-job training program.”
- “Air Midwest did not ensure that its maintenance training was conducted and documented in accordance with the company’s maintenance training program, which degraded the quality of training and inspection activities ...”

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# Roadmap to Safety Culture

## 4. Data Collection and Quality Assurance Programs

- data-driven risk management
- safety audits
- confidential incident reporting systems

# Data collection and analysis

- The organization collects and analyzes “the right kind of data” to keep it informed of the safety health of the organization
  - collects, analyzes and disseminates information on incidents and near-misses, as well as proactive safety checks.

- James Reason, Ph.D.

# Pinnacle Airlines



- Jefferson City, Missouri
- October 14, 2004
- Bombardier Regional Jet
- Repositioning flight
- Both crew members killed

# What the investigation discovered

- Intentional activation of stall warning
- Swapping crew seats
- Rudder mishandling
- Climb to FL 410
  - “have a little fun”
- Automation mismanagement
- Airspeed loss, stall, loss of control, double engine failure
- Did not maintain proper speed for engine failure
- Did not fully disclose real problem with ATC

**Why was the crew at 41,000?**

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# Did the airline ...

- Did the airline know about “410 Club?”
- How did airline monitor adherence to SOPs?
- Did they have a FOQA program?
- Did they have an ASAP program?
- Did they have a Safety Hotline?

# Data collection and analysis

- How do you detect and correct performance deficiencies before an accident?
- How do you keep your finger on the pulse of your operations?
- Do you have multiple data sources?



# Employees



# Are employees comfortable reporting?

- Employees are open to report safety problems, if they receive assurances that:
  - The information will be acted upon
  - Data are kept confidential or de-identified
  - They will not be punished or ridiculed for reporting
    - Non-reprisal policy signed by CEO

# Reporting culture is essential

- “There is growing realization in the aviation industry that encouraging prompt reporting of safety issues actually reduces the number of accidents and incidents.
- “An environment of ‘open reporting’ is a key element in fostering a ‘just culture’ for the systematic reporting, collection, analysis and dissemination of safety information that will be used solely to prevent accidents.”
  - Flight Safety Foundation “Ramp Safety Operational Procedures – A template for ramp supervisors”

# “Just” Culture

- Employees realize they will be treated fairly
  - Not all errors and unsafe acts will be punished (if the error was unintentional)
  - Those who act recklessly or take deliberate and unjustifiable risks will be punished

# Just Culture

“An atmosphere of trust in which people are encouraged, even rewarded, for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior.”

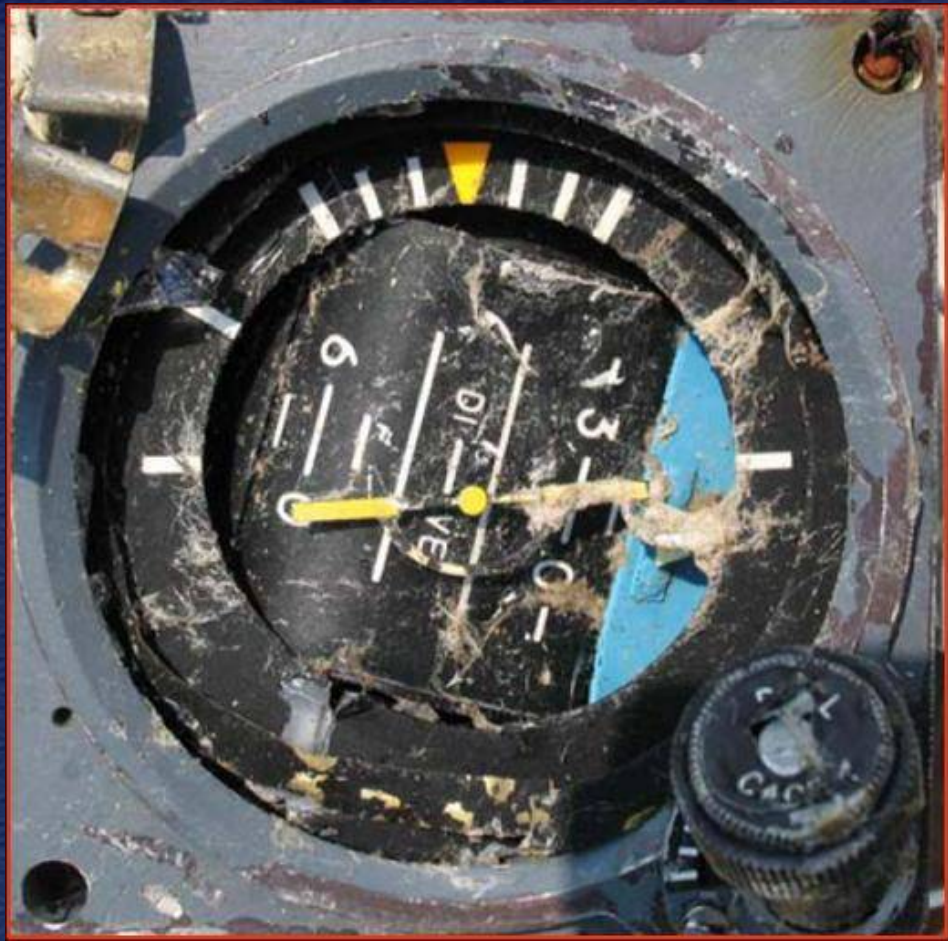
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