“What’s your ETA at destination?”

Social Pressure in the Cockpit

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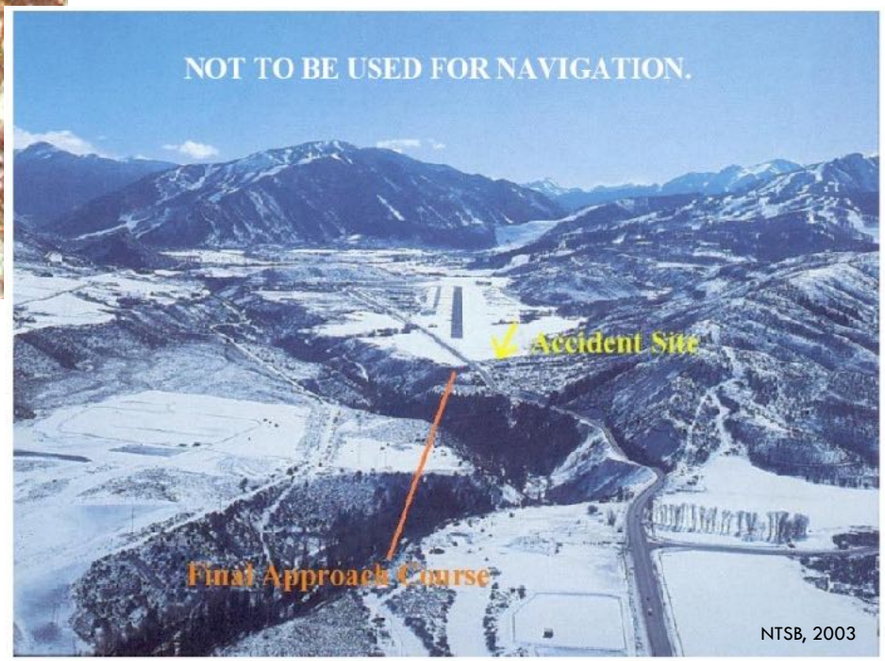
Presented to EAA Chapter 170
July 2024

Gulfstream N303GA Aspen, CO 29 March 2001

Retrieved from: http://www.baaa-acro.com/photos/G3-Airborne-Aspen.jpg



NTSB, 2003

Mission pressure related accidents

- KLM 4805 and Pan Am 1736 Tenerife Spain, 1977
  - Two Boeing 747s collided on the runway, KLM Captain initiated takeoff run in dense fog following extended delays
- Air Ontario Flight 1363 Dryden Ontario, 1989
  - Behind schedule pilot took off with ice on wings, led to Mohansky Commission and Safety Management Systems process
- N9253N Martha's Vineyard MA, 1999
  - JFK Jr. Delayed departure, spatial disorientation during night VMC
- Avjet N303GA Aspen CO, 2001
  - Impacted mountainside on approach in heavy snow, led to Part 135 CRM requirements
- Jolly 38/39 Nellis Range Complex NV, 1998
  - Mid air collision with thunderstorms in area, recently deployed personnel pressured to meet currency requirements
- But really we've all been there…

A little about me….

- Learned to fly at SMX
  - First flight: Nov 87; First Solo Feb 88
  - Private Pilot Sept 88; Instrument June 91
- USAF
  - ATC, Airfield Management, Command Post
  - Keesler MS, Nellis NV, Osan ROK
    - Osan Aero Club Safety Officer
    - EAA Young Eagles (July 1997)
- Embry-Riddle Aeronautical University
  - BS Management of Technical Operations
  - MS Human Factors and Systems
    - Internship: CAMI Cabin Safety Group
    - Thesis explored social influence in the cockpit
  - Transportation Safety Institute - Aircraft Accident Investigator - Basic

My First Flight Instructor

- Sikorsky Aircraft Corporation
  - Crew Stations Integration: Digital Cockpit in Blackhawk, CMWS and Air Warrior integration, Egress Test (60M and Naval Hawk)
  - Aviation & Product Safety
    - Product Safety: Mature Models Team Lead (600+ H-53 and S-61 aircraft)
    - Development Safety: CH-53K Rotor and Drive Systems Hazard Analysis, Cockpit Warning System
    - Proactive Data Analysis: Developed methods to detect emerging safety issues using field data

Flight Plan

- Lets talk about Norms, Uncertainty, and Coping
- Touch on HFACS
- 2009 NASA Study: Mission Pressures in Alaska
- Possible Strategies
- Q&A

Culture and Norms

- Individual behavior patterns are the result of the surrounding culture
  - Manifest as symbols, heroes, rituals, values
  - Apply to national groups and sub-groups (regional, professional) alike

- Values: “Broad tendencies to prefer certain states of affairs over others”
  - Among first things children learn
  - Manifested into behavior using norms

Hofstede, G. H. (1991). Cultures and organizations, Software of the mind, London, McGraw- Hill.

Culture and Norms

- Norms: Patterns of thinking, feeling and behaving endorsed by a group and expected of members
  - Govern behavior not included in laws
    - Include customs, traditions, rules, shared standards; prescribe appropriate attitudes, expected behaviors
  - Used by groups to select effective actions, maintain social relationships, manage self-image
    - Strength and power of norms determined by frequency of communication, uniformity of norm, value/ importance to group
    - Have power because group affiliation provides opportunities for social networking, resource acquisition and social support
  - Norms are transmitted/communicated through social influence
    .

Turner, J.C. (1991) *Social Influence*, Pacific Grove, CA, Brooks/Cole.
Sherif, M. (1966). *The psychology of social norms*, Oxford, England, Harper Torchbooks.
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Culture and Norms

- Social Identification Theory:
  - A single process (referent informational influence) can explain social influences on public and private behavior
  - Three interdependent components:
    - Self-Categorization
      - Group selection based on actual or desired self-definitions
    - Social Cognition
      - Integration of shared group mental model
    - Social Identity
      - Internalized group norms and expectations guide behaviors

- Norms are strengthened as an individual:
  - Selects and joins a group
  - Assimilates group norms and cognitions
  - Rehearses and performs group-sanctioned behaviors

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Norms and Uncertainty

- Norms guide behavior during times of uncertainty
  - Provide subjective validity when physical tests not available
    - Also: feelings of confidence, appropriateness, correctness, social desirability
  - Intentional or inadvertent actions can trigger (prime) use of norms
  - Most focal or salient norm has greatest influence

- Uncertainty is the fundamental force motivating groups and driving group behavior
    - Arises from experience or anticipation of incongruity or disagreement between individual's beliefs, attitudes, behaviors or feelings and those with whom they are expected to agree
    - Uncomfortable due to association with loss of control
    - When physical test not available, look to group prototypes
    - Heuristics may override systematic evaluation of situation

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Turner, J.C. (1991) *Social Influence*, Pacific Grove, CA, Brooks/Cole. Deutsch, M. & Gerard, H.B. (1955). A study of normative and informational social influences upon individual judgment, *Journal of Abnormal Psychology*, 51, 629-636.
Kallgren, C.A., Reno, R.R. & Cialdini, R.B. (2000). A focus theory of normative conduct: When norms do and do not affect behavior, Personality and Social Psychology Bulletin, 26 (8), 1002-1012.
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Uncertainty

- Hofstede's Uncertainty Avoidance: Attitudes towards unfamiliar situations
  - Avoidance of unexpected rather than risk
  - Weak uncertainty avoidance cultures
    - Individuals solve problems at local level using creativity, intuition and persistence
  - Strong uncertainty avoidance cultures
    - Individuals utilize rule-based solutions
  - Strong uncertainly avoidance positively correlated (0.75*) with military accident rates (2000)
    - Theorized correlation was result of military reliance on standardized procedures

- The Power of Uncertainty
  - During uncertainty responses are chosen by costs, benefits, reaction of others
  - Research study example:
    - Participants had to agree on length of three lines (physical test)
    - Four confederates agreed on incorrect answer
    - 77% of participants concurred with the confederates

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Hofstede, G. H. (1991). Cultures and organizations, Software of the mind, London, McGraw- Hill.
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Abrams, D., Wetherell, M., Cochrane, S., Hogg, M.A. & Turner, J.C. (1990). Knowing what to think by knowing who you are: Self-categorization and the nature of norm formation, conformity and group polarization, British Journal of Social Psychology, 29, 97-119.

Coping Strategies

- Stressful events (such as uncertainty in the cockpit) provide opportunities to develop coping strategies (and interpersonal relationships)
  - Interactions can be viewed as challenges or threats
  - Action strategies develop based on perceptions of environment
  - Are internalized over time

- Action strategies cluster around
  - Loss of control (chaos, unpredictability, incongruity) and
  - Coercion (pressure, force, manipulation)
  - Can be met with spirit of concession or defense

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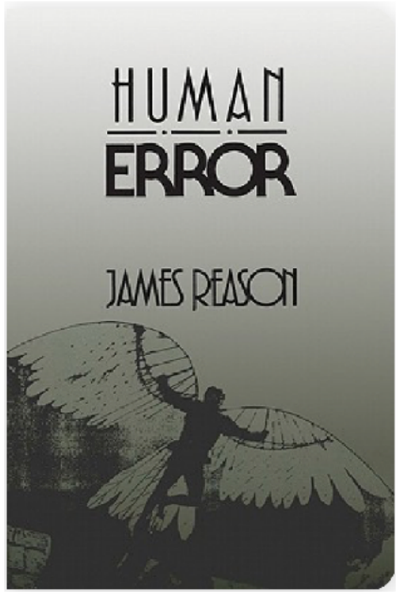
Coping Strategies

- Chaos + Concession = Accommodation
  - Situations are met with openness and flexibility
  - Acceptance of situational constraints
  - Cooperation, Acquiescence, Deference
- Chaos + Defense = Negotiation
  - Prioritization of goals, recognition of goal conflicts
  - Creativity is applied so high-priority personal goals can be achieved while supporting goals of others
- Coercion + Defense = Opposition
  - Goals of others are blocked, situation escalates
  - Defiance, rebellion, explosion, revenge
- Coercion + Concession = Perseverance
  - Loss of flexibility
  - Compliance, conformity, forego self needs to submit to goals of others rather
  - Individuals pursue goals that are no longer attainable at the expense of other more important goals
    - Continuing into severe weather (or past personal minimums) to meet expectations of others

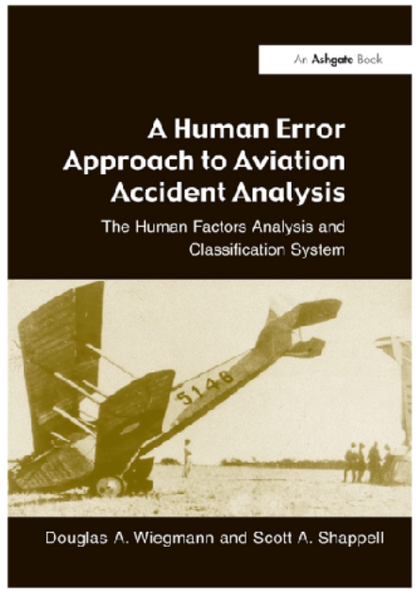
Skinner, E. & Edge, K. (2002). Self-determination, coping and development. In E.L Deci & R.M. Ryan (Eds.), *Handbook of self-determination research*, (pp. 297-338), Rochester, NY, University of Rochester Press.

2009 NASA Study: Flight Ops in Alaska

- Goals:
  - Identify psycho-social influences that pressure pilots to take risks
    - Pressure can be strong or weak, subtle or coercive, direct or indirect.
  - Suggest how HFACS could accommodate these factors



- Human Factors Analysis and Classification System
  - Developed by two Navy flight physician-aviators
  - Operationalized Reason's error taxonomy
    - Reason: Accidents expose latent failures inherent in organizations
      - Not just last person to touch the controls
  - Provides framework to explore:
    - Accident preconditions
    - Supervisory contributions
    - Organizational influences
    - Also differentiates between errors and violations



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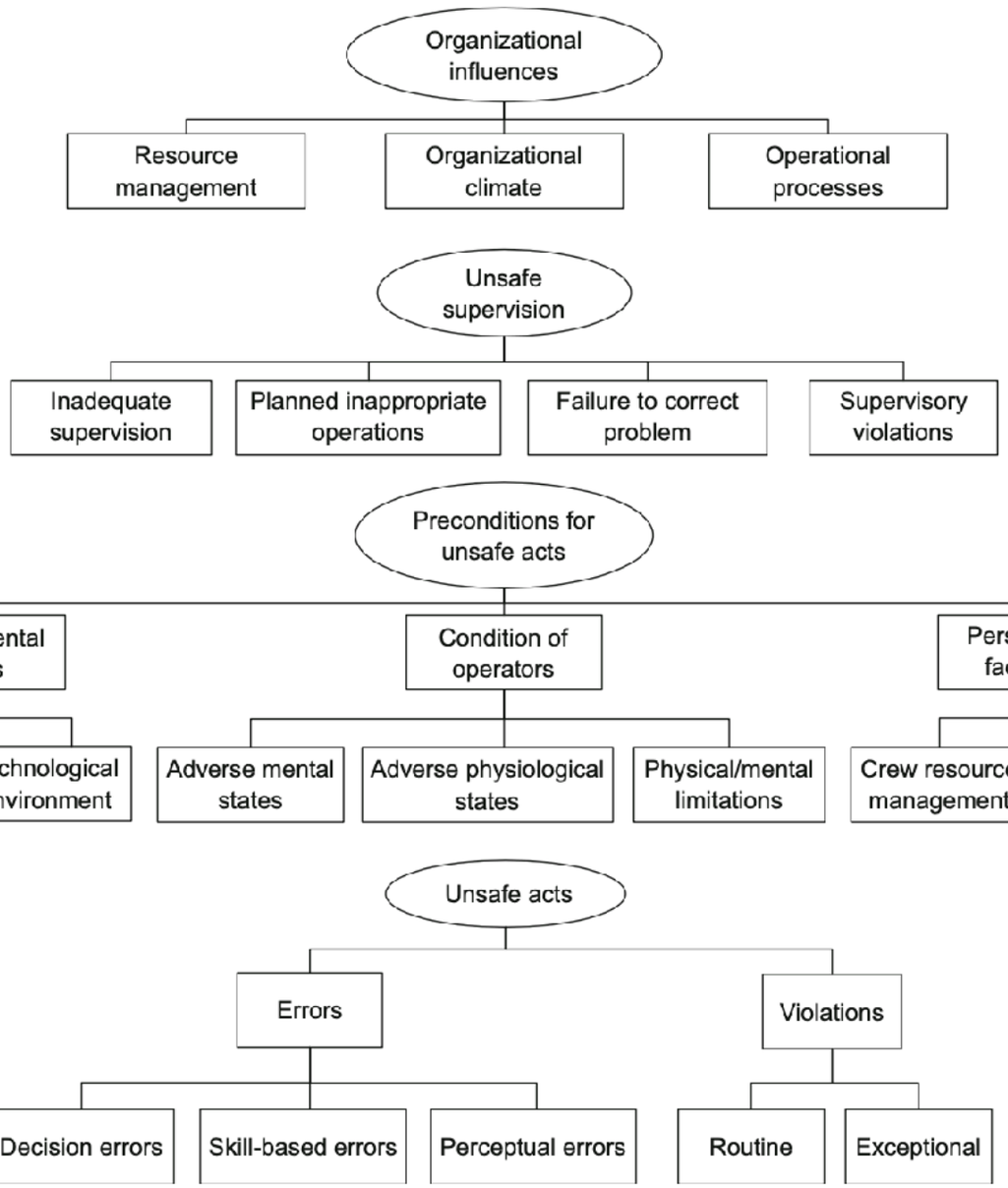
Human Factors Analysis and Classification System



2009 NASA Study: Flight Ops in Alaska

- Alaska cohort chosen to explore social pressure because:
  - Minimal support infrastructure
  - Often encounter marginal, ambiguous, deteriorating weather conditions
  - Only source of basic necessities and transport for remote villages

- Participants
  - 24 pilots, all male, 31-69 years old
    - 250 to 25,000 flight hours over 3.5 to 43 years flying
    - Three private pilots, all other commercial or ATP

- Methods
  - Semi-structured critical incident interviews (1-2 hours long)
  - Participants asked to describe a weather decision situation where their skills were challenged
  - Asked to identify decision points critical cues, goals and concerns
  - Transcripts reviewed and coded per HFACS and social influence definitions

Four Social Influence Themes

- Informational social influence
  - People observe others and copy their behaviors
  - More pervasive in ambiguous situations with a high need for accuracy, and when experts are observed
  - "*He went through the pass and got through it fine but in the 10 minutes it took me to get to where he was the pass had closed.*"
    - Pilots are more likely to fly into heavy weather when following other aircraft
    - "*The chief pilot went and I figured if he could do it I can do it*"

- Foot-in-the-door persuasion
  - Once a person has agreed to a small request they are more likely to agree to a larger one later
  - Stems from complying with requests to be liked or look good to others
  - "*A manager would say why don't you go take a look? You get out there and generally you don't come back*"

Four Social Influence Themes

- Normalization of deviance
  - Incremental acceptance of progressively lower levels of safety by group members
  - Participants become desensitized to the risks they are taking
  - Not necessarily aware they are breaking rules or eroding safety margins
  - End state becomes dramatically different than initially intended
    - *“Departure from the norm becomes the norm” - Dekker*
    - “*It could stay foggy, wet, and rainy for weeks and you get accustomed to it, gradually everyone’s tolerances go lower and lower*”

- Internally-driven impression management and self-consistency (self motives)
  - People do not like to look bad to themselves or others
  - Pressure to avoid social disapproval (disappoint passengers)
  - “*You don’t want to come back and say I couldn’t make it… the other pilots made it, what’s wrong with you?*”

Dekker, SAK (2011) Systems Thinking 1.0 and Systems Thinking 2.0: Complexity science and a new conception of “cause”, *Aviation in Focus (Port Alegre)*, v.2, n.2, p. 21-39 – aug./dec. 2011

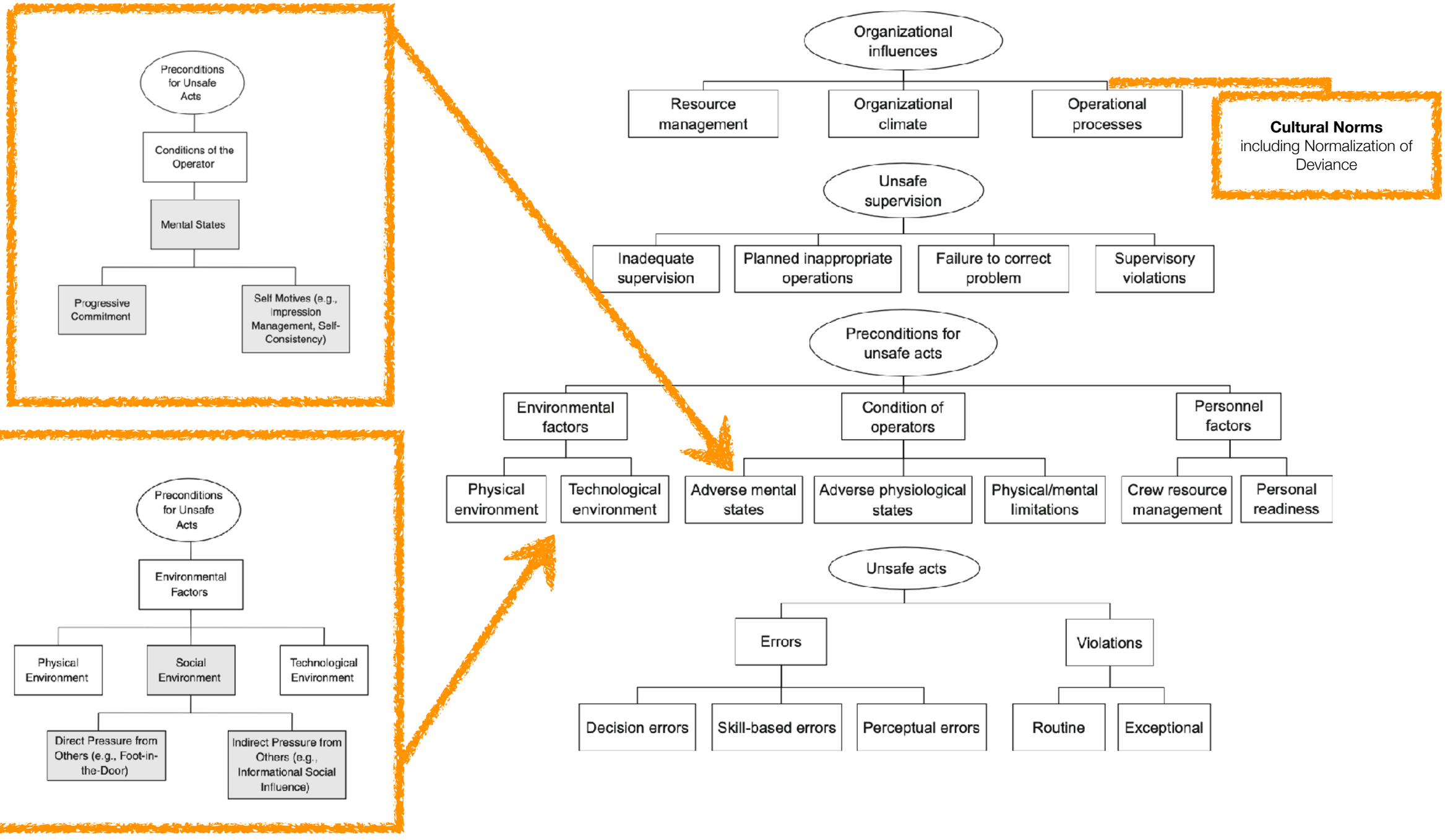
2009 NASA Study: Findings

- 16 participants recounted pressure that fit one or more of the 4 profiles
  - 7 Informational influence
  - 3 Foot-in-the-door
  - 5 Normalization of deviance
  - 5 Self-motives

- Participants reported being challenged by
  - Rapidly deteriorating weather conditions
  - Spotty, unreliable weather reporting

- Participants reported being pressured by
  - Management, other pilots
  - Passengers, local villagers
  - Even themselves (internal pressure)

Social Pressure and HFACS



Gulfstream N303GA Aspen, CO 29 March 2001

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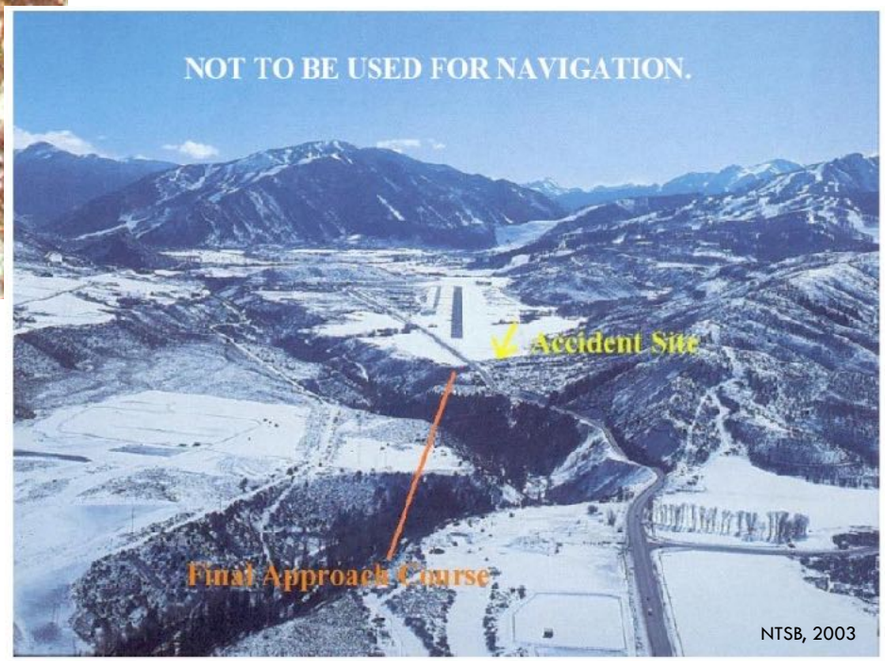


NTSB, 2003

Where to go from here

- Researchers: Social pressures can lead pilots to underestimate potential dangers
  - Contributes to poor decision making
  - Recommended pilot training, closer attention during accident investigations, additional research

- What can we do?

Possible Strategies

- Admit that mission pressure exists
  - Even (especially) in GA environment

- Listen for it in storytelling
  - *The Right Stuff*
  - *West with the Night*
  - Mission Safety International
  - HEMS accident vs. Royal Aeronautics Society Aircrew of the Year
    - Outcome bias
  - Stories we tell each other

Possible Strategies

- Role-play (rehearse) different scenarios, game out alternatives for when:
  - Enroute or destination weather is marginal
  - Terrain would require you to fly at edge of aircraft performance
  - Destination is at edge of fuel range
  - Passengers delay arrival time (into night or deteriorating weather)
  - Weather deteriorates en route
  - You promised a specific arrival time (or window)
  - You (or your passenger) have a specific destination
  - You have a specific activity to attend or perform
    - Family celebration, business travel, Angel flights

- "*He went through the pass and got through it fine but by the time I got there…*"
- "*So and so went and I figured if he could do it I can do it*"
- "*Why don't you go take a look?*"
- "*It could stay foggy, wet, and rainy for weeks and you get accustomed to it, gradually everyone's tolerances go lower and lower*"
- "*You don't want to come back and say I couldn't make it… the other pilots made it, what's wrong with you?*"

- Brainstorm other scenarios

Possible Strategies

- FAA Risk Management Handbook has some good ideas!

- Develop personal minimums (PAVE checklist)
  - Pilot, Aircraft Performance and Equipage, EnVironment, External Pressure
  - FAA Risk Management Handbook FAA-H-8083-2A, Chapter 3

- Assess risk for different scenarios (Flight Risk Assessment Tool)
  - List hazards, likelihood, and severity
  - Watch out for long-tail hazards (Catastrophic Improbables combine and become Black Swans)
  - FAA Risk Management Handbook FAA-H-8083-2A, Chapter 4

- Develop mitigation strategies
  - IMSAFE checklist, fuel reserves, change departure time or date (or cancel flight), etc.
  - FAA Risk Management Handbook FAA-H-8083-2A, Chapter 5+6

Possible Strategies

- Share your stories and lessons learned
  - Aviation is a storytelling culture!

To Fly, or Not to Fly?

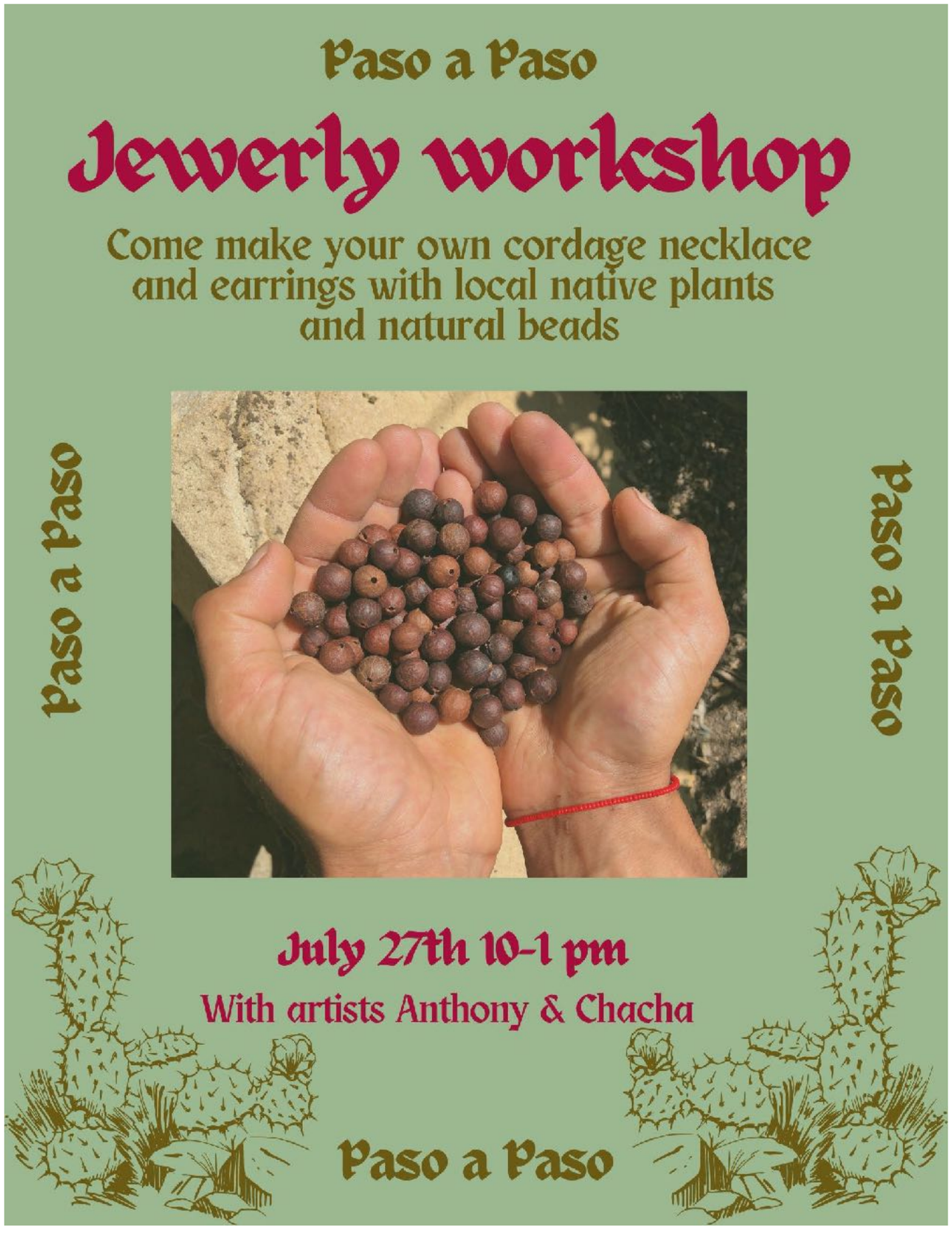
When you fly, sometimes you have to make hard choices. Sometimes when you want to fly, there are many reasons, or just one reason, not to fly. And as pilots, we have to make the tough, and possibly the most important decision: go or no-go. It's especially hard to decide not to fly when others around you are making plans to lift off. I experienced that feeling when it was time to leave the Southwest Section meeting in Carson City, Nevada. Most everyone who had flown in was making plans on how they would get home—selecting different routes, flying IFR, going high, waiting for it to warm up and melt the snow and ice. I knew, in my gut, when I woke up, that it wasn't my day to fly. But, as I listened to others making their plans, I *so* wanted to be able to fly like them. The thing is, I have different skills, experience, and ratings. I have a different plane with different capabilities. And I had different outside pressures to consider. As much as I wanted to fly, to execute the original plan, I had to make the call that it wasn't right for me to fly that day. I'm thankful that my passenger never questioned my decision or pushed me to reconsider, in fact, she quickly

~ from the SLO 99s June 2024 *Slipstream*

Questions?

Thoughts?

Comments?



Fly-In Opportunity

- Saturday July 27
  - Not next Saturday but the Saturday after
- Location: Art space at the New Cuyama grocery store
- 10am to 1pm
- FREE!
- RSVP to Liz Fish
  - liz@blueskycenter.org
  - So we have enough materials

Brought to you by CAL Arts and the Blue Sky Center