Docket No. SA-509

Exhibit No. 14B

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, DC

USAir PHASE I CRM TEXT

USAir

CREW RESOURCE MANAGEMENT

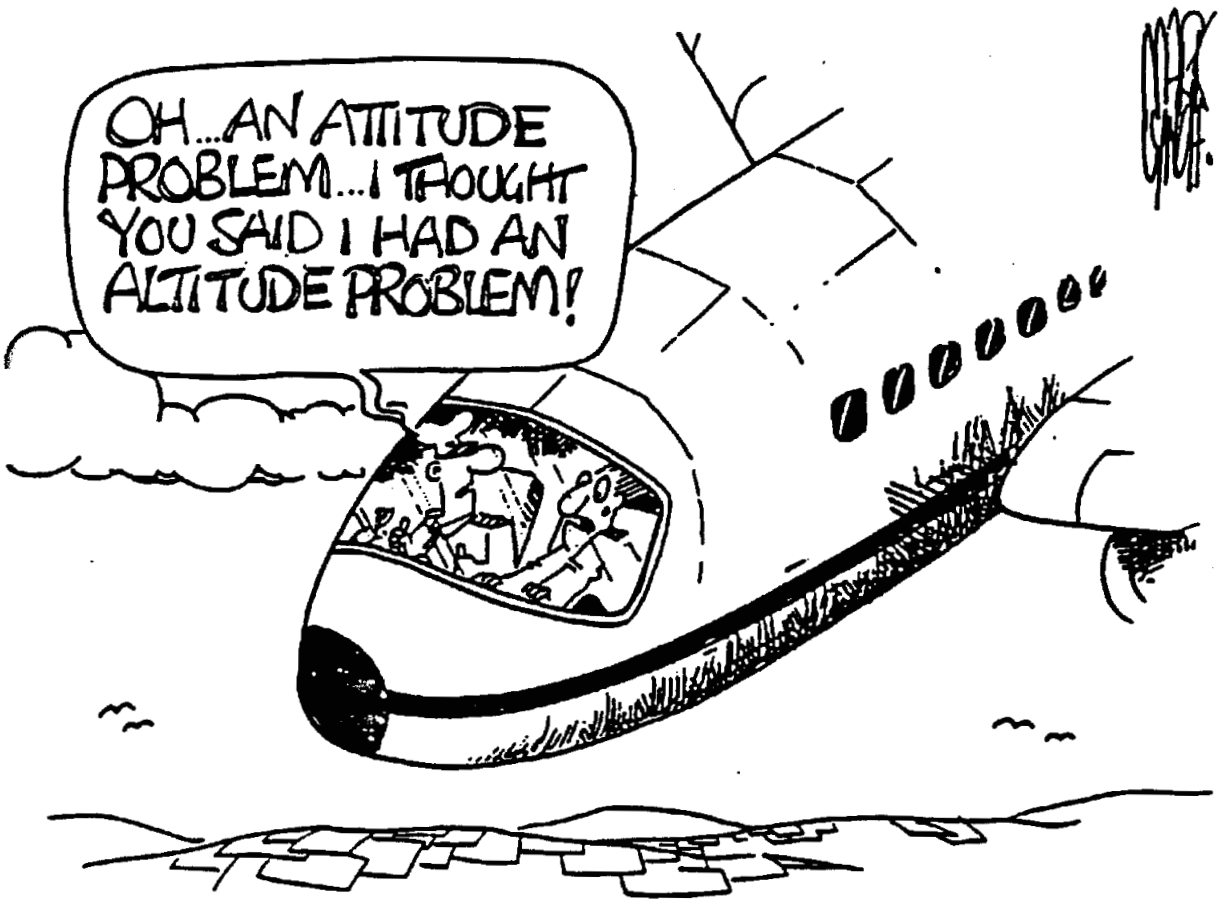
PILOT HANDOUT

INDEX

"When anyone asks me how I can best describe my experience in nearly forty years at sea, I merely say, uneventful. Of course there have been winter gales, and storms and fog and the like, but in all my experience, I have never been in a accident of any sort worth speaking about. I have seen but one vessel in distress in all my years at sea.... I never saw a shipwreck and have never been shipwreck, nor was I ever in any predicament that threatened to end in disaster of any sort."

E.J.Smith 1907

On 14 April 1912 RMS TITANIC sank with the loss of 1500 lives - one of which was it's Captain.....E.J.Smith.


OH...AN ATTITUDE PROBLEM...I THOUGHT YOU SAID I HAD AN ALTITUDE PROBLEM!

4.18A

NOTES

CRM WORKSHEET

BRIEFING:

1. _____
2. _____
3. _____

ASSERTION:

1. _____
2. _____
3. _____
4. _____
5. _____

INQUIRY:

1. _____
2. _____
3. _____
4. _____

EFFECTIVE ASSERTION:

1. _____
2. _____
3. _____
4. _____
5. _____

WORKLOAD MANAGEMENT:

1. _____
2. _____
3. _____
4. _____

BIG PICTURE:

1. _____
2. _____
3. _____

NOTES

SITUATIONAL AWARENESS:

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

REVIEW MODEL

1._____

2._____

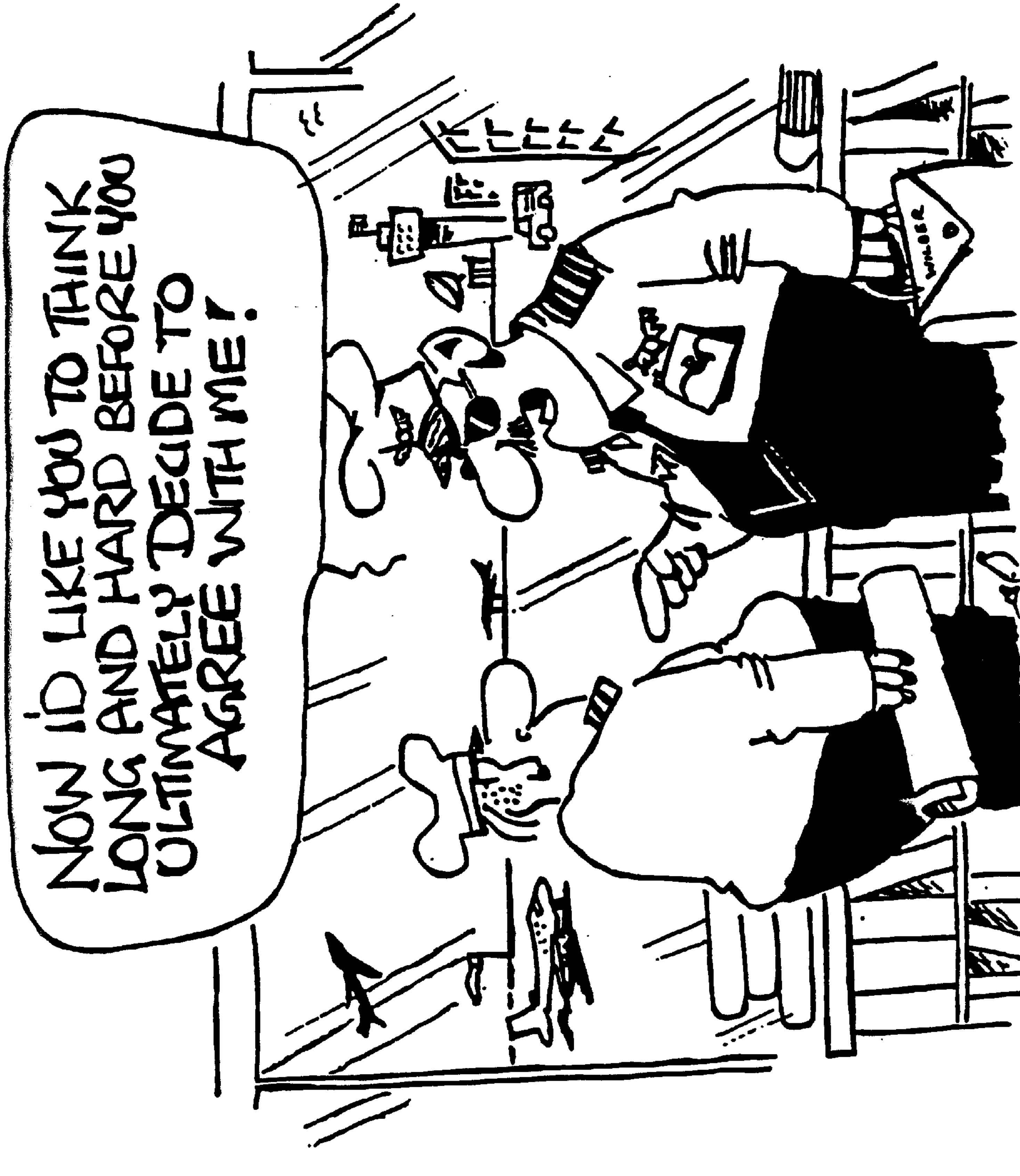
3._____

Whadaya Mean, Lucky?

Almost every periodical that you picked up during 1977 had some reference to the Trans-Atlantic flight of Charles A. Lindbergh that he accomplished 50 years ago. Each one of us in the airline business owes something of their career to "Slim" and his pathfinding flight. Almost immediately after his Paris arrival, they started calling him "Lucky Lindy." Headlines proclaimed how "lucky" he was. The song "Lucky Lindy" became an instant hit. Finally, when his mother was connected to him via a transoceanic phone call, she said, "Son, you really were lucky." And he groaned, "Not you, too, mother?"

You see, the young airmail pilot felt that he made his own luck. His luck in making it came from months of planning, studying, designing, investigating and preparing. He prepared himself and he had prepared his equipment. He made numerous overloaded takeoffs under varying conditions and had practice navigating his aircraft with his new compass, few other instruments, and no cockpit visibility. He had checked the crossing weather to the best of his ability. He was as well prepared as a pilot could have been in that day and age. In the 90's, we still can't discount luck as a factor in our daily flying, but "Lindy's Luck", as ours, lies 99% in preparation, planning and vigilance.

NOTES


NOW I'D LIKE YOU TO THINK LONG AND HARD BEFORE YOU ULTIMATELY DECIDE TO AGREE WITH ME!

NOTES

WHY CRM AT USAir

The FAA and industry have long recognized the importance of cockpit (crew) resource management in crewmember training. CRM training addresses human factors, ie; leadership, communication skills, time management, situational awareness, and attitudes in flight operations. Training to improve performance in these areas has been identified as a factor in reducing the number of airline accidents and incidents. Investigations of air carrier accidents over the last 12 years have shown that human error was a contributing factor in approx 70% of them. Additionally long term NASA studies have revealed that problems encountered by flight crews have very little to do with technical operations. But instead are associated with a lack of;

- Proper decision making
- Ineffective communication
- Inadequate leadership
- Poor resource management

Part 121 does not sufficiently address human factors training,so an advisory circular (AC 120-51) incorporating the crew behavioral markers was written to serve as a guideline for development and implementation of Human Factors training into an air carrier's operation. The amount of evidence accumulated on air carrier incidents supports the need to include human factors and crew resource management into, current flight training programs.

There will be three phases to USAir's program, which was built in house, to fit our unique crew culture and operating environment.

Phase I (what we're involved with today), is the awareness or introduction phase, to help pilots refamiliarize themselves with the basic concepts and philosophy of Crew Resource Management.

Phase II is the practice feedback phase of CRM training. It is designed to provide crewmembers with self and peer critique in order to improve communication, decision making and leadership. This will be accomplished through the use of simulators and video equipment.

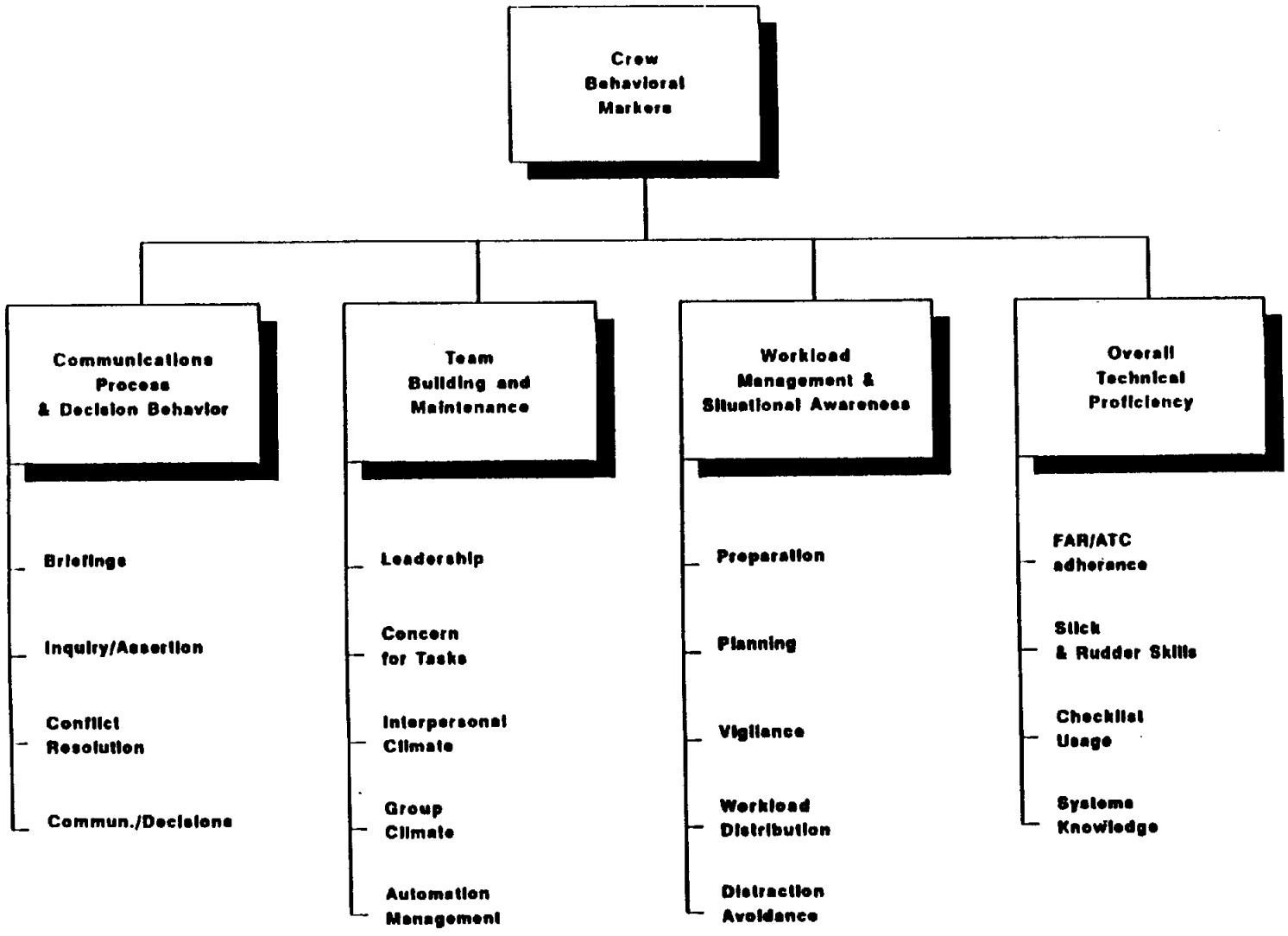
To maintain his annual proficiency qualification, a Captain must take two simulator rides a year. One ride is classified as a check (PC) and the other pilot training (PT). The sessions are alternated every six months with the PC being two hours in duration and the PT being four. A First Officer is only required one simulator ride during the same 12 month period. This leads to a situation where Captains are paired.

The FAA and NTSB have voiced concerns over the breakdown in seat task dependency when training in this format. In other words, when a Captain was flying from the right seat, or a First Officer from the left, there was a noticeable degradation in learning. A way to address these issues, is to bring a First Officer in for an additional period. The additional time would then fulfill seat task dependency and enhance training.

Phase II will be conducted in a two hour **NON JEOPARDY**, video taped LOFT, using a crew concept (Captain and First Officer). The LOFT will be flown during the second two hour block of the Captain's PT. It will be a two leg trip (PIT-DCA-PIT) flown in real time. There will be little to no instructor input, other than as necessary to add realism. The instructor's responsibility is to note crew interaction during the various phases of the trip and to help, afterwards, with the crewmembers self-critique.

Video feedback is extremely effective, for it allows us to see ourselves from a third person perspective. After a review and critique, the crew will erase the tape. No recorded tapes will be allowed to be taken out of the simulator. Remember, this period is a completely **NON JEOPARDY EVENT**.

Phase III is part of a continuing educational program that will be addressed during recurrent ground school.


Crew
Behavioral
Markers
Communications
Process
& Decision Behavior
Briefings
Inquiry/Assertion
Conflict
Resolution
Commun./Decisions
Team
Building and
Maintenance
Leadership
Concern
for Tasks
Interpersonal
Climate
Group
Climate
Automation
Management
Workload
Management &
Situational Awareness
Preparation
Planning
Vigilance
Workload
Distribution
Distraction
Avoidance
Overall
Technical
Proficiency
FAR/ATC
adherance
Stick
& Rudder Skills
Checklist
Usage
Systems
Knowledge

NASA/UT

NOTES

CREW BEHAVIOR MARKERS

The behavioral markers created by the NASA/UT group served as the basis for which USAir's CRM program was developed. The markers give a clear and concise outline of the factors needed for a crew to operate as an effective team.

The first grouping of crew effective markers is labeled communication processes and decision behavior. These include briefings, inquiry/assertion, conflict resolution, and communications/decisions. Many of these markers overlap one another. The following is a composite list.

(A) Briefing (conduct and quality). An effective briefing should be operationally thorough by addressing operational and interpersonal issues (coordination, planning, and problems). The establishment of open communications should be encouraged.

(B) Inquiry/Assertion. The extent to which crewmembers advocate the course of action they feel best, even when it involves conflict or disagreement with others.

(C) Conflict Resolution. The means employed to resolve disagreements among crewmembers over an appropriate course of action and recommended techniques for maintaining open communication in the face of informational conflict.

(D) Communications/Decisions. Techniques of seeking and evaluating information. Open communication should include providing necessary information at the appropriate time (for example; initiate checklist, alert others to developing problems). Active participation in the decision making process should be encouraged and practiced. Decisions should be clearly communicated and acknowledged.

Team Building and Maintenance. This area includes interpersonal relationships and practices. Effective leadership and followership along with interpersonal relationships are the key concepts. It could also include recognizing and dealing with different personalities and styles. Operational factors include:

(A) Leadership/Followership/Concern for Task. It's the coordination of activities by maintaining a proper balance of authority and assertiveness.

(B) Interpersonal Relationships/Group Climate. Showing sensitivity and ability to adapt to other crewmembers' personalities and styles. Recognizing symptoms of fatigue and stress and taking appropriate action. Maintaining a friendly, relaxed, and supportive tone in the cockpit.

(C) Automation Management. Automated glass cockpit aircraft require a greater effort on behalf of the crewmembers to communicate and coordinate changes that effect flight conditions.

Workload Management and Situational Awareness. This reflects the extent to which crewmembers maintain awareness of their operational environment and anticipate contingencies that may require action. Instruction may address the practices (ie: vigilance, effective planning and time management, task prioritizing, avoidance of distractions) that result in higher levels of situational awareness.

(A) Preparation/Planning/Vigilance. Devotion of appropriate attention to required tasks. Responding to new information. Preparing in advance for required activities.

(B) Workload Distribution/Distraction Avoidance. Proper allocation of tasks to individuals. Avoidance of work overloads. Prioritization of tasks during periods of high workload. Preventing non-essential factors from distracting attention from critical tasks.

Overall Technical Proficiency. This area concentrates on the technical aspects of the flight which is essential for a safe and efficient operation. Demonstrated mastery of CRM concepts cannot overcome a lack of proficiency, as high technical proficiency cannot guarantee a safe operation in the absence of effective coordination.

(A) Adherence to FAR's and ATC requirements, and compliance with company established procedures including checklist management and standard callouts.

(B) Ability to demonstrate a high level of basic (stick and rudder) flying skills.

(C) Briefings to include all pertinent safety and operational issues as defined in the Pilot Handbook and FOM.

(D) Demonstrated knowledge of aircraft systems and normal, abnormal, and emergency procedures.

NOTES

AIR FLORIDA, FLT 90

14TH STREET BRIDGE WASHINGTON, D.C.
JANUARY 13, 1982

ABSTRACT

On January 13, 1982, Air Florida Flight 90, a Boeing 737-222 (N62AF), was a scheduled flight to Fort Lauderdale, Florida, from Washington National Airport, Washington D.C. There were 74 passengers, including 3 infants, and 5 crewmembers on board. The flight's scheduled departure time was delayed about 1 hour 45 minutes due to a moderate to heavy snowfall which necessitated the temporary closing of the airport.

Following takeoff from runway 36, which was made with snow and/or ice adhering to the aircraft, the aircraft at 1601 e.s.t. crashed into the barrier wall of the northbound span of the 14th Street Bridge, which connects the District of Columbia with Arlington County, Virginia, and plunged into the ice-covered Potomac River. It came to rest on the west side of the bridge 0.75 nmi from the departure end of runway 36. Four passengers and one crewmember survived the crash.

The National Transportation Safety Board determined that the probable cause of this accident was the flight crew's failure to use engine anti-ice during ground operation and takeoff, their decision to take off with snow/ice on the airfoil surfaces of the aircraft, and the Captain's failure to reject the takeoff during the early stage when his attention was called to anomalous engine instrument readings. Contributing to the accident were the prolonged ground delay between deicing and the receipt of ATC takeoff clearance during which the airplane was exposed to continual precipitation, the known inherent pitchup characteristics of the B-737 aircraft when the leading edge is contaminated with even small amounts of snow or ice, and the limited experience of the flightcrew in jet transport winter operations.

NOTES

ALASKA AIRLINES, FLT 60

KETCHIKAN INTERNATIONAL AIRPORT
APRIL 5, 1976

ABSTRACT

About 0819 pacific standard time on April 5, 1976, Alaska Airlines, Inc., Flight 60, a Boeing 727-81 N124AS, over-ran the departure end of runway 11 at Ketchikan International Airport, Ketchikan, Alaska. The aircraft crashed in a ravine about 700 feet past the runway threshold. There were 43 passengers and a crew of 7 on board. As a result of the crash, 1 person died and 32 persons were injured. The aircraft was destroyed by impact and ground fire.

The Captain of Flight 60 had conducted an approach to runway 11 under conditions of low ceilings and low visibility. The aircraft touched down on the wet runway beyond the normal touchdown point and at excessive speed.

The National Transportation Safety Board determines that the probable cause of the accident was the Captain's faulty judgement in initiating a go-around after he was committed to a full-stop landing following an excessively long and fast touchdown from an unstabilized approach.

Contributing to the accident was the pilot's unprofessional decision to abandon the precision approach.

NOTES

DELTA AIR LINES, FLT 191

DALLAS/FORT WORTH INTERNATIONAL AIRPORT, TEXAS
AUGUST 2, 1985

ABSTRACT

On August 2, 1985, at 1805:52 central daylight time, Delta Air Lines flight 191, a Lockheed L-1011-385-1, N726DA, crashed while approaching to land on runway 17L at the Dallas/Fort Worth International Airport, Texas. While passing through the rain shaft beneath a thunderstorm, flight 191 entered a microburst which the pilot was unable to traverse successfully. The airplane struck the ground about 6,300 feet north of the approach end of runway 17L, hit a car on a highway north of the runway killing the driver, struck two water tanks on the airport and broke apart. Except for the section of the airplane containing the aft fuselage and empennage, the reaminder of the airplane disintegrated during the impact sequence and a severe fire that erupted during the impact sequence.

Of the 163 persons aboard, 134 passengers and 8 crewmembers were killed; 26 passengers and 3 cabin attendants survived.

NOTES

EASTERN AIRLINES, FLT 401

MIAMI, FLORIDA
DECEMBER 29, 1972

ABSTRACT

An Eastern Airlines Lockheed L-1011 crashed at 2342 eastern standard time, December 29, 1972, approximately 18 miles west-northwest of Miami International Airport, Miami, Florida. The aircraft was destroyed. There were 163 passengers and a crew of 13 aboard the aircraft; 94 passengers and 5 crewmembers received fatal injuries. All other occupants received injuries which ranged in severity from minor to critical.

The flight diverted from its approach to Miami International Airport because the nose landing gear was not indicating locked in the down position. The aircraft climbed to 2,000 feet mean sea level and followed a clearance to proceed west from the airport at that altitude. During this time, the crew attempted to correct the malfunction and to determine whether or not the nose landing gear was extended.

The aircraft crashed into the Everglades shortly after being cleared by Miami Approach control for a left turn back to Miami International Airport. Surviving passengers and crewmembers stated that the flight was routine and operated normally before impact with the ground.

The National Transportation Safety Board determined that the probable cause of this accident was the failure of the flight crew to monitor the flight instruments during the final 4 minutes of flight, and to detect an unexpected descent soon enough to prevent impact with the ground. Preoccupation with a malfunction of the nose landing gear position indicating system distracted the crew's attention from the instruments and allowed the descent to go unnoticed.

NOTES

NORTHWEST AIRLINES, FLT 255

DETROIT METROPOLITAN WAYNE COUNTY AIRPORT
AUGUST 16, 1987

ABSTRACT

About 2046 eastern daylight time on August 16, 1987, Northwest Airlines, Inc., flight 255 crashed shortly after taking off from runway 3 center at the Detroit Metropolitan Wayne County Airport, Romulus, Michigan. Flight 255, a McDonnell Douglas DC-9-82, U.S. Registry N312RC, was a regularly scheduled passenger flight and was enroute to Phoenix, Arizona.

According to witnesses, flight 255 began its takeoff rotation about 1,200 to 1,500 feet from the end of the runway and lifted off near the end of the runway. After liftoff, the wings of the airplane rolled to the left and the right about 35 degrees in each direction. The airplane collided with obstacles northeast of the runway when the left wing struck a light pole located 2,760 feet beyond the end of the runway. Thereafter the airplane stuck other light poles, the roof of a rental car facility, and then the ground. It continued to slide along a path aligned generally with the extended centerline of the takeoff runway. The airplane broke up as it slid across the ground and post impact fires erupted along the wreckage path. Three occupied vehicles on a road adjacent to the airport and numerous vacant vehicles in a rental car parking lot along the airplane's path were destroyed by impact forces and/or fire.

Of the persons on board flight 255, 148 passengers and 6 crewmembers were killed; 1 passenger, a 4-year-old child, was injured seriously. On the ground, two persons were killed, one person was injured seriously, and four persons suffered minor injuries.

The National Transportation Safety Board determined that the probable cause of the accident was the flightcrew's failure to use the taxi checklist to ensure that the flaps and slats were extended for takeoff. Contributing to the accident was the absence of electrical power to the airplane takeoff warning system which thus did not warn the flightcrew that the airplane was not configured properly for takeoff. The reason for the absense of electrical power could not be determined.

NOTES

UNITED AIRLINES, FLT 173

PORTLAND, OREGON
DECEMBER 28, 1978

ABSTRACT

About 1815 Pacific standard time on December 28, 1978, United Airlines, Inc., Flight 173 crashed into a wooded, populated area of suburban Portland, Oregon, during an approach to the Portland International Airport. The aircraft had delayed southeast of the airport at a low altitude for about 1 hour while the flightcrew coped with a landing gear malfunction and prepared the passengers for the possibility of a landing gear failure upon landing. The plane crashed about 6 nmi southeast of the airport. The aircraft was destroyed; there was no fire.

Of the 181 passengers and 8 crewmembers aboard, 8 passengers, the flight engineer, and a flight attendant were killed, 21 passengers and 2 crewmembers were injured seriously.

The National Transportation Safety Board determined that the probable cause of the accident was the failure of the Captain to monitor properly the aircraft's fuel state and to properly respond to the low fuel exhaustion to all engines. His inattention resulted from preoccupation with a landing gear malfunction and preparations for a possible landing emergency.

Contributing to the accident was the failure of the other two flight crewmembers either to fully comprehend the criticality of the fuel state or to successfully communicate their concern to the Captain.

NOTES

UNITED AIRLINES, FLT 232

SIOUX CITY, IOWA
JULY 19, 1989

ABSTRACT

On July 19, 1989, at 1516, a DC-10-10, N1819U, operated by United Airlines as flight 232, experienced a catastrophic failure of the No. 2 tail-mounted engine during cruise flight. The separation, fragmentation and forceful discharge of stage 1 fan rotor assembly parts from the No. 2 engine led to the loss of the three hydraulic systems that powered the airplane's flight controls. The flight crew experienced severe difficulties controlling the airplane, which subsequently crashed during an attempted landing at Sioux Gateway Airport, Iowa. There were 285 passengers and 11 crewmembers onboard. 110 passengers and one flight attendent were fatally injured.

The National Transportation Safety Board determined that the probable cause of this accident was the inadequate consideration given to human factors limitations in the inspection and quality control procedures used by United Airlines' engine overhaul facility which resulted in the failure to detect a fatigue crack originating from a previously undetected metallurgical defect located in a critical area of the stage 1 fan disk that was manufactured by General Electric Aircraft Engines. The subsequent catastrophic disintegration of the disk resulted in the liberation of debris in a pattern of distribution and with energy levels that exceeded the level of protection provided by design features of the hydraulic systems that operate the DC-10's flight controls.

NOTES

UNITED AIRLINES, FLT 811

HONOLULU, HAWAII
FEBRUARY 24,1989

ABSTRACT

On February 24, 1989, United Airlines (UAL), flight 811, a Boeing 747-122 (B-747), N4713U, was being operated as a regularly scheduled flight from Los Angeles, California (LAX) to Sydney, Australia (SYD) with intermediate stops in Honolulu, Hawaii (HNL) and Auckland, New Zealand (AKL). There were 3 flightcrew, 15 flight attendants, and 337 passengers aboard the airplane.

The flightcrew reported the airplane's operation to be normal during the takeoff from Honolulu, and during the initial and intermediate segments of the climb. The flightcrew stated that the first indication of a problem occurred while the airplane was climbing between 22,000 and 23,000 feet at an indicated airspeed (IAS) of 300 knots. They heard a sound, described as a "thump," which shook the airplane. They said that this sound was followed immediately by a "tremendous explosion." The airplane had experience an explosive decompression. They said that they donned their respective oxygen masks but found no oxygen available. Engines No. 3 and 4 were shut down because of damage from foreign object ingestion.

The airplane made a successful emergency landing at HNL and the occupants evacuated the airplane. Examination of the airplane revealed that the forward lower lobe cargo door had separated in flight and had caused extensive damage to the fuselage and cabin structure adjacent to the door. Nine of the passengers had been ejected from the airplane and lost at sea.

The National Transportation Safety Board determined that the probable cause of this accident was the sudden opening of the improperly latched forward lower lobe cargo door in flight and the subsequent explosive decompression. Contributing to the cause of the accident was a deficiency in the design of the cargo door locking mechanisms, which made them susceptible to inservice damage, and which allowed the door to be unlatched, yet to show a properly latched and locked position.

NOTES

USAIR, FLT 105

KANSAS CITY, MISSOURI
SEPTEMBER 8,1989

ABSTRACT

On September 8, 1989, N283AU, a Boeing 737-200 operated as USAir flight 105 was a regularly scheduled revenue passenger flight conducted under 14 Code of Federal Regulations Part 121 from Pittsburgh, Pennsylvania, to Wichita, Kansas, with an en route stop in Kansas City, Missouri. Fifty-eight passengers, two flight crewmembers and four flight attendants were onboard. A Federal Aviation Administration inspector who was performing an enroute inspection occupied the cockpit observer's seat. The flight from Pittsburgh to the Kansas City area was uneventful.

The Captain was the pilot flying and the First Officer was performing the communications with air traffic control. USAir 105 was cleared to execute the localizer back course approach to runway 27 at 2129:41. At 2134:23, the local controller told USAir 105 "I can't tell for sure but it appears we have lost the lighting on the south side of the airport." The flightcrew later described seeing a bright flash about this time. Subsequent inspection revealed that the airplane struck and severed four electronic transmission cables, located about 75 feet above the ground, approximately 7,000 feet east of the runway 27 threshold. The flightcrew executed a missed approach and landed uneventfully in Salina, Kansas. None of the passengers or crew was injured, but the airplane sustained minor damage in the incident.

The National Transportation Safety board determined that the probable cause of this incident was the flightcrew's failure to adequately prepare for and execute a nonprecision approach and their subsequent premature descent below minimum descent altitude. Contributing to the cause of the incident was the inadequate and deficient services provided to the flightcrew by air traffic control personnel.

NOTES

USAIR, FLT 5050

LAGUARDIA, NEW YORK
SEPTEMBER 20, 1989

ABSTRACT

On September 20, 1989, USAir, Inc. flight 5050 was departing New York City's LaGuardia Airport, Flushing, New York, for Charlotte Douglas International airport, Charlotte, North Carolina. As the First Officer began the takeoff on runway 31, he felt the airplane drift left. The Captain noticed the left drift also and used the nosewheel tiller to help steer. As the takeoff run progressed, the aircrew heard a "bang" and a continual rumbling noise. The Captain then took over and rejected the takeoff but did not stop the airplane before running off the end of the runway into Bowery Bay. Instrument flight conditions prevailed at the time and the runway was wet.

The National Transportation Safety Board determines that the probable cause of this accident was the Captain's failure to exercise his command authority in a timely manner to reject the takeoff or take sufficient control to continue the takeoff, which was initiated with a mistrimmed rudder. Also causal was the Captain's failure to detect the mistrimmed rudder before the takeoff was attempted.

The safety issues discussed in this report were the design and location of the rudder trim control on the Boeing 737-400, air crew coordination and communication during takeoffs, crew pairing, and crash survivability.

NOTES

COURSE REVIEW

USAIR CRM

DEFINITION OF CRM

EFFECTIVE USE OF ALL RESOURCES,

HUMANWARE, SOFTWARE, AND HARDWARE

TO

ACHIEVE SAFE AND EFFICIENT FLIGHT

OPERATIONS

USAIR CRM

LACK OF CRM

PROPER DECISION MAKING

INEFFECTIVE COMMUNICATION

INADEQUATE LEADERSHIP

POOR RESOURCE MANAGEMENT

USAIR CRM

CRM IS NOT

HOT TUB HARMONY

VOTING IN THE COCKPIT

FIX IT COURSE FOR SKYGODS

PSYCHOLOGY OR PERSONALITY PROFILE

TESTING

NOTES

COURSE REVIEW

NOTES

USAIR CRM

CRM IS NOT

BEHAVIOR DICTATED BY MANAGEMENT

CAPTAIN'S TRAINING

NOT AN ATTEMPT TO USURP CAPTAIN'S AUTHORITY

NOT SUBSTITUTE FOR FLYING SKILLS

USAIR CRM

CRM IS

BETTER TEAM WORK

NEW SKILLS

ACCIDENT PREVENTION

LEADERSHIP/FOLLOWERSHIP

OPERATING PHILOSOPHY

USAIR CRM

GROUND RULES

NEED TO BE INVOLVED

DISAGREE W/O BEING DISAGREEABLE

WHATEVER IS SAID HERE STAYS HERE

MAKE A POINT TWICE

THEN MOVE ON

COURSE REVIEW

USAIR CRM

LEARNING

TELL ME AND I FORGET

SHOW ME AND I REMEMBER

INVOLVE ME AND I UNDERSTAND

USAIR CRM

CRM ACCIDENTS

EAL 401

UAL 173

NW 255

DL 191

ALASKA 60

USAIR CRM

THEN AND NOW

TODAY WE NEED A NEW TYPE OF SKILL

NOTES

NOTES

USAIR CRM

CAPTAIN'S AUTHORITY

FAR 91.3

THE PILOT IN COMMAND IS DIRECTLY RESPONSIBLE FOR, AND IS THE FINAL AUTHORITY AS TO, THE OPERATION OF THAT AIRCRAFT

USAIR CRM

CAPTAIN'S AUTHORITY

FOM

CO-AUTHORITY WITH FLIGHT DISPATCH

AUTHORITY TO DELAY,CANCEL OR DISCONTINUE FLIGHT

USAIR CRM

CAPTAIN'S AUTHORITY

IT IS ONLY THE CAPTAIN'S NAME/ SIGNATURE THAT GOES INTO THE LOG BOOK

COURSE REVIEW

USAIR CRM

CAPTAIN'S AUTHORITY

THE CAPTAIN IS THE ONLY ONE RESPONSIBLE

FOR THE SIGNING OF THE DISPATCH RELEASE

USAIR CRM

CAPTAIN'S AUTHORITY

THE VP OPERATIONS HAS JUST RECENTLY

VERIFIED THAT THE CAPTAIN IS SOLELY

RESPONSIBLE FOR ALL ASPECTS OF THE

AIRCRAFT OPERATIONS

USAIR CRM

TEAM BUILDING OVERVIEW

INTRODUCTIONS

ESTABLISH GUIDELINES

AUTHORITY

NOTES

COURSE REVIEW

USAIR CRM

INTRODUCTIONS

CAPTAIN RESPONSIBLE FOR INTRODUCTIONS

THROUGH SOME FORMAT

ALL CREWMEMBERS SHOULD MEET

USAIR CRM

ESTABLISH GUIDELINES

SAFETY

EFFECTIVE COMMUNICATIONS

COOPERATION

USAIR CRM

ESTABLISH GUIDELINES

SAFETY IS OUR MOST IMPORTANT

CONSIDERATION

NOTES

COURSE REVIEW

NOTES

USAIR CRM

EFF COMMUNICATIONS

EST HOW TEAM IS TO COMMUNICATE

QUIET FLIGHT DECK

SAFETY PROBLEMS BELOW 10,000FT

USAIR CRM

COOPERATION

EST HOW TEAM IS TO WORK TOGETHER

IF YOU HAVE A PROBLEM IN THE BACK

LET ME KNOW

HAVE I MISSED ANYTHING

USAIR CRM

AUTHORITY PRINCIPLES

PERSONAL COMPETENCE

TECHNICAL COMPETENCE

SOCIAL COMPETENCE

COURSE REVIEW

NOTES

USAIR CRM

AUTHORITY PARADOX

CAPTAIN'S AUTHORITY IS MANDATED

WITH AUTHORITY COMES ACCOUNTABILITY
RESPECT MUST BE EARNED

USAIR CRM

SUMMARY

EYE CONTACT

FIRST NAMES

ASK FOR PARTICIPATION

DON'T BE KEEPER OF ALL KNOWLEDGE

ASK QUESTIONS

LET OTHERS TALK

USAIR CRM

FACTORS EFF COMM

MULTIPLE MEANINGS

TOP 500 WORDS 14,000 MEANINGS

-BODY LANGUAGE

58% BODY LANGUAGE

37% TONALITY

7% VERBAL

COURSE REVIEW

USAIR CRM

DEFINITION OF SYNERGY

TO WORK TOGETHER

COMBINED OR CORRELATED ACTION

OF DIFFERENT PARTS PERFORMING

COMPLEX ACTION

USAIR CRM

RECURRENT TEST

1+1+1=4

GROUP ACHIEVES HIGHER SCORE FASTER

ONE RIGHT ANSWER MAY HAVE HELPED THE GROUP

USAIR CRM

SYNERGY

CIRCLES DENOTE SENSE OF

RESPONSIBILITY

NOTES

COURSE REVIEW

USAIR CRM

SYNERGY

THE WHOLE IS GREATER THAN THE

SUM OF THE PARTS

EACH PERSON HAS A RESPONSIBILITY

FOR THE SAFE COMPLETION OF THE

FLIGHT

USAIR CRM

WHAT IS INQUIRY

QUESTIONING/INQUIRY

CURIOSITY

AWARENESS

INVOLVEMENT

USAIR CRM

WHAT IS ASSERTION?

APPROPRIATE PERSISTENCE

TIMELY

CLEAR

FOCUSED

PROPOSE SOLUTION

NOTES

COURSE REVIEW

NOTES

USAIR CRM

EFFECTIVE ASSERTION

OPENING

EXPRESS CONCERN

STATE THE PROBLEM

PROPOSE SOLUTION

ACHIEVE AGREEMENT

USAIR CRM

ASSERTION MODEL

APPROPRIATE PERSISTENCE

TIMELY

CLEAR

FOCUSED

PROPOSE SOLUTION

USAIR CRM

CONFLICT

CONFLICTING INFORMATION

NATURAL

NOT NECESSARILY BAD

NOT CONFRONTATIONAL

WHAT'S RIGHT

NOT WHO IS RIGHT

COURSE REVIEW

USAIR CRM

CONFLICT RESOLVED

HIGHER STD OF PERFORMANCE

IMPROVED CREATIVITY

REDUCED FRUSTRATION AND STRESS

ENHANCED TEAMWORK

USAIR CRM

DECISIONS BEHAVIOR

DECISIVE

QUICK DECISIONS

DON'T CHANGE

USAIR CRM

CREW REVIEW MODEL

GATHER THE INFORMATION

WHAT IS THE DECISION

WHAT IS THE CONSEQUENCE

WHAT IS THE ALTERNATIVE

IS THERE A NEW OR BETTER WAY

NOTES

COURSE REVIEW

NOTES

USAIR CRM

WORK LOAD MANAGEMENT

ACKNOWLEDGE PERSONAL LIMITS

PRIORITIZE AND DELEGATE

SHARE AND COMMUNICATE

ACTIVELY MONITOR

USAIR CRM

DEFINE OF S.A.

THE ACCURATE PERCEPTION OR KNOWLEDGE A PILOT MAINTAINS TO THEIR OPERATIONAL ENVIRONMENT IN ORDER TO ANTICIPATE CONTINGENCIES AND TAKE THE NECESSARY ACTION

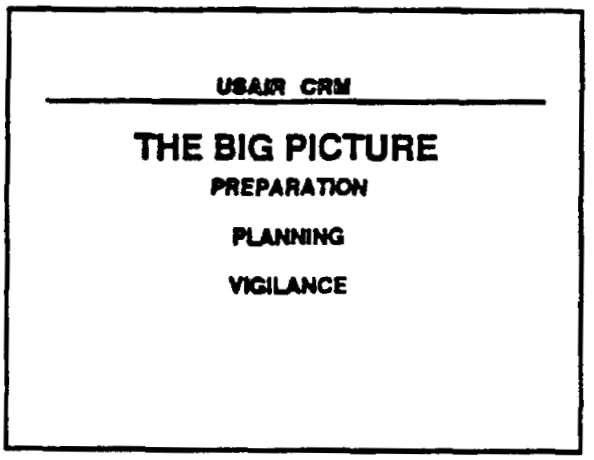
USAIR CRM

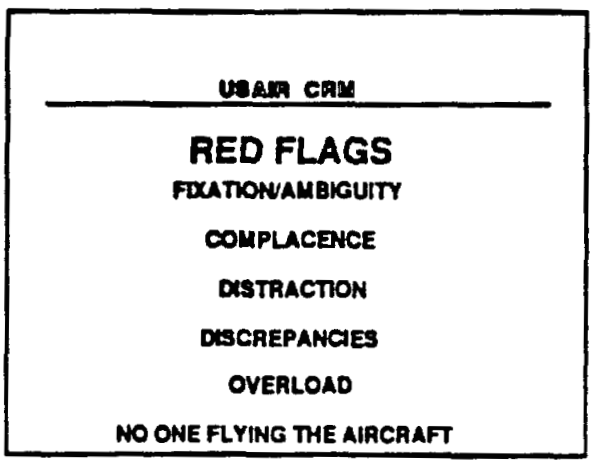
SITUATIONAL AWARENESS

IT'S HAVING THE BIG PICTURE

COURSE REVIEW

NOTES





COURSE REVIEW

NOTES

USAIR CRM

GETTING SA BACK

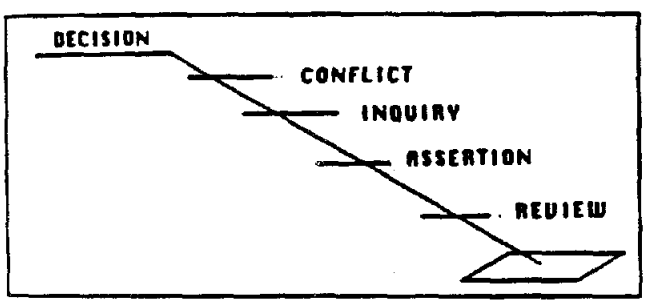
VERBALIZE YOUR CONCERN

TAKE THE TIME

MAKE THE EFFORT

ASSERTION

YOU HAVE TO LISTEN TO ME



NOTES

RED FLAGS/SYMPTOMS TO A LOSS OF SITUATIONAL AWARENESS

1. FIXATION:
   - The focus of attention on any one item to the exclusion of all others.
     - -- Various malfunctions
     - -- Cockpit warning indications that distract attention to other gauges, switches, etc.

2. AMBIGUITY:
   - Two or more independent sources of information that do not agree.
     - -- Engine power indications
     - -- Throttle position versus power

3. COMPLACENCY:
   - A feeling of contentment or satisfaction
     - -- I've done this a hundred times

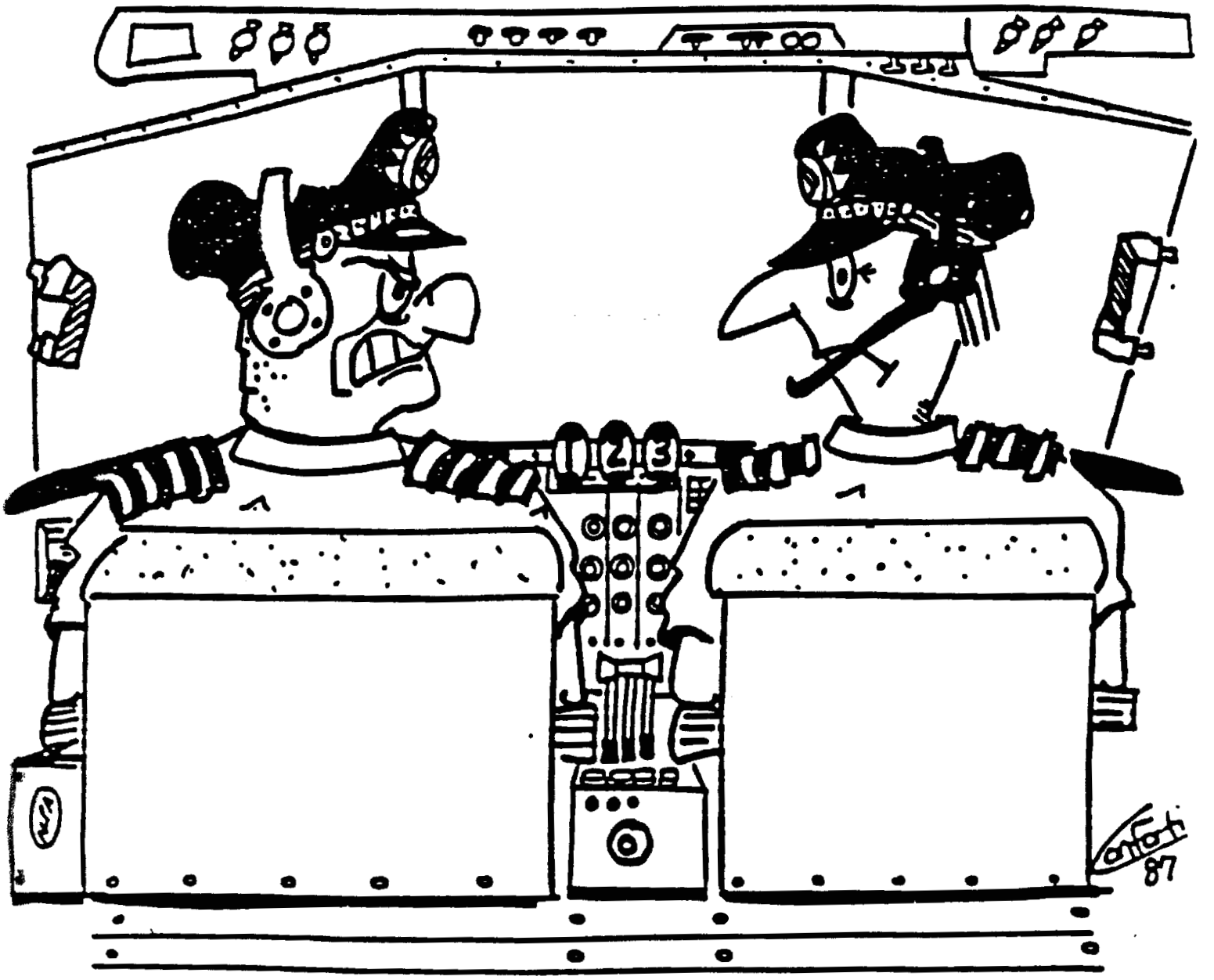
4. DISTRACTION:
   - To cause to turn away from the original focus of attention
     - -- Becoming engrossed in the detail at the expense of equally or more important items
       - --- Eastern 401

5. UNRESOLVED DISCREPANCY:
   - Failure to resolve conflicts of opinion, changes in weather or other conditions.
     - -- Forgotten about or ignored
       - --- Air Florida, Washington DC
         - ---- EPR gauges indicated something other than what was happening to the aircraft.

6. OVERLOAD:
   - To load too heavily
     - -- Too busy to stay on top of it all or just bored.

7. NO ONE FLYING THE AIRCRAFT:
   - No one monitoring the current state and progress of a flight.
     – Eastern 401

8. IMPROPER PROCEDURES:
   - Intent to, or departure form prescribed standard operating procedure.



*"Oh, I believe in resource management all right . . .
you're the resource and I'm the management!"*

Reprinted from *Air Line Pilot*, April 1988.

USAir

Date: December 18, 1991

Interoffice Correspondence

To: All Pilots

From: Vice President - Flight Operations

Subject: **CAPTAIN'S AUTHORITY**

I've been asked to address and reaffirm the corporation position on the subject of Captain's authority.

My position is that the Captain is responsible for all associated operational activities with regard to that aircraft including preflight, flight, and post flight. All support functions for a flight or aircraft are to be coordinated through the Captain or a designee. This applies to all boarding, fueling, maintenance, or any other activities associated with the operation of USAir aircraft. This responsibility begins when the Captain is in the vicinity of the aircraft for preflight or planning purposes and continues until control of the aircraft is relinquished to a responsible party.

The Captain has joint authority with the licensed Dispatcher assigned to a particular flight. Before any flight may be originated, both the Captain and Dispatcher must agree that the planned flight can be accomplished safely and in accordance with all applicable company policies and FAA regulations.

The Captain's authority, however, does not include such items as whether or not to hold an aircraft for connecting passengers, or to add a flag stop to protect revenue. These decisions are normally made by System Control in concert with local station management. Ideally, the Captain should be informed of these types of scenarios as early as possible so as to be able to solicit his/her input during the decision making process.

Captain's authority is absolutely necessary for the safe operation of our aircraft. Understand that Captain's authority, bounded by tradition and regulation, must be coupled with common sense, courtesy and cooperation. Without a doubt, the Captain is responsible for the safety of his/her aircraft and its occupants at all times and is in command of the crew that has been assigned for the purpose of flight operations from the time the duty period begins to when it ends.

Captain Gene Sharp
Vice President, Flight Operations

NOTES

NOTES

WORKING WITH THE FLIGHT ATTENDANTS

by
Jim Langenhahn
Professional Standards
US AIRWAVES
February,1991

Certainly nobody lives or works in a vacuum, and operating a passenger airliner requires an intense amount of coordination among a number of skilled employees. No closer coordination is required than that between the pilots and the flight attendants. Having never been a flight attendant I can't give you their perspective, yet it is important that we, as pilots, know and understand their point of view. Linda Kuntz is a very experienced flight attendant, and she is the LEC Vice-president of AFA Local 40 in PIT. Many management and union folks know and respect Linda for the work she has done. At my request, Linda was kind enough to write for me the following short article to help us understand the flight attendant perspective and help us perform better as a team.

"When Jim Langenhahn approached me to contribute an article for the ALPA MEC news magazine, I was somewhat apprehensive. This article was to contain suggestions that may help pilots and flight attendants maintain a better line of communication when on trips.

"As I began to explore the possibilities, I looked back on some of my experiences coupled with reports we receive from flight attendants using professional standards. In the next few lines I will attempt to offer what I believe are the three more critical areas that could make or break the whole communication process.

"An introduction at the onset of a trip is the best ice breaker I know. When a flight attendant enters the cockpit to say hello, a civil greeting is truly welcome. I can vividly recall the pilots who over the years thought that a "grunt" in our direction was sufficient. Things usually went down hill from there.

"I also recall with fondness those precious few words that have on occasion been uttered: 'LET ME KNOW IF YOU NEED ANY HELP, OR HAVE ANY PROBLEMS BACK THERE.' When you have that kind of reassurance from your crew, I believe you can handle anything that comes along.

"One last thing that seems to be lost and would really add to crew respect an consideration is being brought into the loop when making decisions

concerning legalities and various areas of the flight attendant working agreement. Our contract is important to us. Including flight attendants in this process can only enhance the mutual respect within a crew.

"I have been a flight attendant for twenty years; I have a pretty fair idea of what can work. I am also realistic here - there are bound to be problems. Let's keep things in the right perspective and use professional standards committees - they are for all of us.

"I am sure by now you have heard Jim speak about his ONE TEAM theory! I do not think there is any better way to participate, after all, we really are ONE TEAM!"

Thank you very much, Linda, for sharing this with us. I think you bring the points home well. Remember, Captains, your decisions affect the lives and well being of passengers and crew, not to mention job satisfaction. That wraps it up for now. Remember: Liberty, Equality, Fraternity.

Two Sides of the Same Coin

Cockpit resource management programs and Professional Standards Committees can work together for greater air safety.

By Capt. J. A. McIntyre (TWA, Ret.)

"You professional standards people are like an old worn-out coin, destined for the church collection box." The phenomenal rise of cockpit resource management (CRM) programs in the airlines has led some overly ardent CRM advocates to believe that pilot-run professional standards is an idea whose time has come and gone.

CRM is generally defined as a flight-crew-coordinated team effort that uses all means available to enhance safe aircraft operations. Resources here include all elements, both in and out of the cockpit, that reinforce the crew's ability to function as a team while they cope with the various situations thrust upon them in real-life conditions. Management skills include the ability to lead and to follow, to communicate both within the cockpit and outside it, to gather and evaluate information, to solve problems, to assess and assign crew member task loads, to make decisions, to resolve conflicts, and to control stress.

All elements of CRM training should reinforce cockpit chain of command and the crew's awareness of what is going on throughout the operation of the flight.

With its emphasis on behavior modification to enhance crew performance, CRM has certainly had some real success stories. The highly publicized 1989 United Airlines' accidents, near Honolulu, Hawaii, and at Sioux City, Iowa, are two prime examples of crew teamwork at its absolute best under extremely trying conditions. At Hawaii, the B-747 crew had to make a two-engine-out, night landing with a substantial portion of the right forward fuselage missing. And at Sioux City, the DC-10 crew had to instantly invent a flying technique to contend with a critically wounded aircraft that had almost no flight control ability following a catastrophic failure of the center engine. Both crews credited their CRM training with having helped them to cope with these unprecedented situations that "no one ever dreamed would happen."

To count Professional Standards Committee efforts out "before the fat lady sings," however, may be a bit premature at this point. In fact, what is actually evolving between CRM and professional standards is a mutually beneficial relationship that was always there to begin with — like the two sides of a coin. To understand this interdependent correlation, we have to recognize the similarities and differences between the two methods of trying to enhance flight safety by influencing cockpit behavior.

CRM basically extends each airline management's operating philosophy. It emanates from the top down and reflects the corporate culture and management's commitment to the program. As a result, the quality of the programs and training courses vary widely. They range from one company's giving its program mere lip service to another company's total dedication to CRM. All CRM programs require some commitment of airline resources.

CRM programs also require FAA scrutiny and approval. They are designed to further flight safety and to produce a more efficient cockpit operating atmosphere. "Using all available resources" is a basic premise of CRM programs, which involve all the crew, the aircraft, and the flight environment. CRM programs are designed to enhance the captain's authority by providing the best combination of available resources to assist in the command decision requirement of the federal aviation regulations, which still hold the captain responsible for the safety of the flight.

A Professional Standards Committee (PSC) is, by contrast, an employee-generated effort to enhance flight safety by providing a peer group mechanism for dealing primarily with legitimate concerns about inappropriate actions of other crew members in the cockpit. In ALPA, it is a service by and for its members to solve cockpit-related problems "within the family" before they become subject to company discipline or to FAA enforcement. While ALPA often cooperates some with management, a PSC is strictly a union-led activity for the benefit of its collective membership. Like CRM, an ALPA PSC fully recognizes the captain's ultimate responsibility and authority for the flight's safe passage.

Each PSC's success is due primarily to the pilot group's voluntary dedication to overcoming those human factors in cockpit conflicts that affect flight safety. A PSC's success also involves a degree of enlightened self-interest: "If we don't clean up our own house, someone else will do it for us." The overall appeal to pilot professionalism has also proven to be very strong.

ALPA PSCs do not try to abrogate a company's

A Professional Standards Committee solves problems "within the family," before they become too big.

Capt. Tom Lambrick (UAL) won UAL's Safety Award for his Professional Standards Committee work.

right to discipline its employees or FAA's duty to enforce its regulations. The committees do try to resolve issues before they get to that level of involvement. A PSC relies on peer group pressure characterized by caring concern, respect for the person, confidentiality, and the group dynamics of pilot professionalism.

Neither CRM nor a PSC is a substitute for good equipment, strong operating procedures, competent maintenance, or effective standardization. The basics remain firmly in place.

Neither CRM nor a PSC is a "hot tub" situation where crew members necessarily emerge from the experience liking each other. The goal of both is to enable the crew to work effectively together whether they like each other or not.

One side effect to CRM training is becoming increasingly evident — a few pilots react contrary to what the CRM training intended. Apparently, these persons enter the CRM training with minimum interpersonal skills and actually feel threatened by the experience. They become very defensive and come away from the training showing a reinforced negative attitude.

Dr. R. L. Helmreich of the University of Texas has identified this reaction as the "boomerang effect." Whether this condition is temporary or long lasting is not yet known. Some in aviation firmly believe that a proverbial 2 percent of pilots will always be "boomerangs." Hopefully, offsetting this phenomenon is the benefit from CRM training that enables the other crew members to still work with their difficult peer.

Most researchers into CRM agree that further research into the negative side effects is warranted, if only to determine what other possible counseling or training may be needed.

The hiring criteria and initial training of pilot applicants, particularly those involved in ab-initio training programs, need to be explored and brought up to date with the increasing industry trend toward crew-oriented team training in today's advanced-technology cockpits in a very demanding environment.

Ultimately, the challenge remains of what to do with those individuals whose cockpit behavior becomes unacceptable before their conduct becomes a threat to flight safety. Pilots generally agree that peer pressure exerted through ALPA's own Professional Standards Committees can provide an effective, interim method of dealing with the problem of aberrant cockpit behavior. Additionally, Dr. Clay Foushee, Chief Scientific and Technical Advisor for Human Factors at FAA, and Dr. John Lauber, member of the National Transportation Safety Board, have recognized ALPA's work in this area.

Before becoming too concerned about a very small minority of pilots who are having trouble quickly adapting to far-reaching changes in basic behavior patterns and accepting that the day of the solo airline pilot has ended, it might be well to consider:

- Many of those who are "fighting the program" have had perfect safety records over a long period of time and may just be reluctant to immediately change from a known area that has served them well to an unknown and hostile (to them) realm of conduct.
- Only in the last few years, accelerated by CRM, has any serious attempt been made to train aircrews as a team. The traditional method has been for each pilot to be trained and checked as an individual with very little or no help from the other crew members. In fact, most CRM training is currently being authorized by exemption to the federal aviation regulations.
- The majority of pilots entering the airline system today are from general aviation, where flying solo is a way of life. Also, some military pilots may still have the fighter-pilot "right stuff," solo mentality when they join the airlines. On the other hand, both of these pilot groups seem to adapt readily, in the early stages of their airline careers, to CRM team training.

One of the finest examples of PSC and CRM working together involves Capt. Tom Lambrick, who has been the ALPA PSC chairman at United.

The aftermath of the bitter strike at UAL pointed up the need for professionals standards involvement even though the airline has had a well-recognized CRM program. Labor/management relations were badly in need of repair. The airline also faced the challenge of recovering from the prolonged shutdown. In addition, former striking pilots were now flying with those who had crossed the strike picket lines — a volatile situation, to say the least.

The PSC went to both the union leadership and UAL management and said, "We may never speak to each other off the airplane, but we pilots simply

Code of Ethics

ALPA's Code of Ethics forms the basis for Professional Standards Committee work.

An Air Line Pilot *will keep uppermost in his mind that the safety comfort, and, and well-being of the passengers who entrust their lives to him are his first concern and greatest responsibility.*

An Air Line Pilot *will faithfully discharge the duty he owes the air line which employs him and whose salary makes possible his way of life.*

An Air Line Pilot *will accept the responsibilities as well as the rewards of command, and will at all times so conduct himself both on duty and off as to instill and merit the confidence and respect of his crew, his fellow employees and his associates within the profession.*

An Air Line Pilot *will conduct his affairs with other members of the profession and the Association in such a manner as to bring credit to the profession and the Association as well as to himself.*

To an Air Line Pilot *the honor of his profession is dear, and he will remember that his character and conduct reflect honor or dishonor upon his profession.*

have to work together in the cockpit or the results could be disastrous. We owe it to ourselves and our passengers." And they did it.

In 1989, Capt. Lambrick was presented with UAL's annual Safety Award. The company's award recognized Capt. Lambrick's successful efforts to promote flight safety through effective ALPA work on professional standards.

This combination of cockpit resource management and Professional Standards Committees, like the two-sided coin, can operate together to reduce the problems of human error in the cockpit and enhance flight safety. ✈

Capt. J.A. McIntyre, chairman of ALPA's Professional Standards Committee, recently chaired the SAE Flight Operations Committee and served on the NASA Aviation Safety Reporting System Advisory Subcommittee. He has also given testimony on human factors in aviation to the Office of Technology Assessment, U.S. Congress. Capt. McIntyre retired as a TWA B-747 captain in October 1987 and has flown more than 25,000 accident-free hours on worldwide routes. This article was prepared from a paper he gave at the SAE/AREF conference on Human Error Avoidance Techniques at Herndon, Va., Sept. 18–19, 1989.