



Design Resource Management

What the airlines and the military can teach us about our industry

Stuckey Insurance's Annual Risk Management Seminar 2015
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Course Objectives



1. Learn to recognize human factors that have defined the parameters of safety and accident mitigation in the airline industry
 2. Apply the lessons learned in the airline industry to the design professional industry in a manner that will minimize the frequency and severity of losses, increase human performance, and promote client satisfaction and profitability
 3. Develop the management tools necessary to create a positive culture shift within a firm that embraces the concept of design resource management
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Design Resource Management



- Derived from the term “Crew Resource Management”
 - A management system which makes optimum use of all available resources – equipment, procedures and people – to promote safety and enhance the efficiency of operations – Wikipedia
 - Still maintains hierarchy
 - It is not decision by committee
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Crew Resource Management



- If you see something, say something
- If you see me doing something wrong, I don't know it



Photo courtesy of Scott Stewart circa 2002

- Emphasis on human error
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History of Crew Resource Management

- Cockpit Resource Management
 - Coined in 1979 by NASA psychologist John Lauber
 - United Airlines Flight 173
 - December 28, 1978 – Portland, OR
 - Captain distracted by landing gear anomaly (burned out bulb)
 - Ignored hints from crew that plane was running out of fuel
 - Ran out of fuel and crashed
 - NTSB cause: fuel exhaustion due to pilot error (lack of situational awareness)
 - NTSB recommended: participative management for captains and assertiveness training for crewmembers
 - Beginning of Crew Resource Management revolution in airline training
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Crew Resource Management



- Human error is inevitable
 - Goal: error management, not error elimination
 - Analysis of human factors
 - A multidisciplinary field incorporating psychology, engineering, industrial design statistics, operations research, and anthropometry
 - Explains the human component to errors and omissions
 - Human factors directly cause or contribute to 80% of aviation accidents
 - Higher for design professionals?
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FAA Research – The Dirty Dozen



Lack of Communication	Lack of Teamwork
Lack of Assertiveness	Complacency
Fatigue	Stress
Lack of Knowledge	Lack of Resources
Lack of Awareness	Distraction
Pressure	Bad Norms

Asiana Airlines Flight 214



- July 6, 2013 landing at San Francisco International Airport
- Boeing 777 lands short of runway in perfect weather



Courtesy of International Business Times – 7/15/13

Asiana Airlines Flight 214



- Air crew
 - Two captains and one first officer
 - Captain operating controls under supervision had 43 hours in a Boeing 777
 - NTSB Cause: mismanagement of approach and inadequate monitoring of airspeed
 - Contributing human factors
 - Automation reliance and inadvertent deactivation of automatic airspeed controls; i.e., complacency
 - Lack of compliance with procedures and CRM
 - Lack of communication
 - Lack of assertiveness
 - Lack of awareness
 - Lack of teamwork
 - Lack of knowledge (unfamiliar with autopilot settings)
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Impact of Implementing CRM

- Commercial airline industry
 - U.S. air disasters fall from 20 per year to 2 per year
 - Coast guard
 - Reduced accident rate by 74%
 - Medical field – operating rooms
 - Fire departments
 - Widely used in the Military
 - Architects and engineers
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Design Resource Management



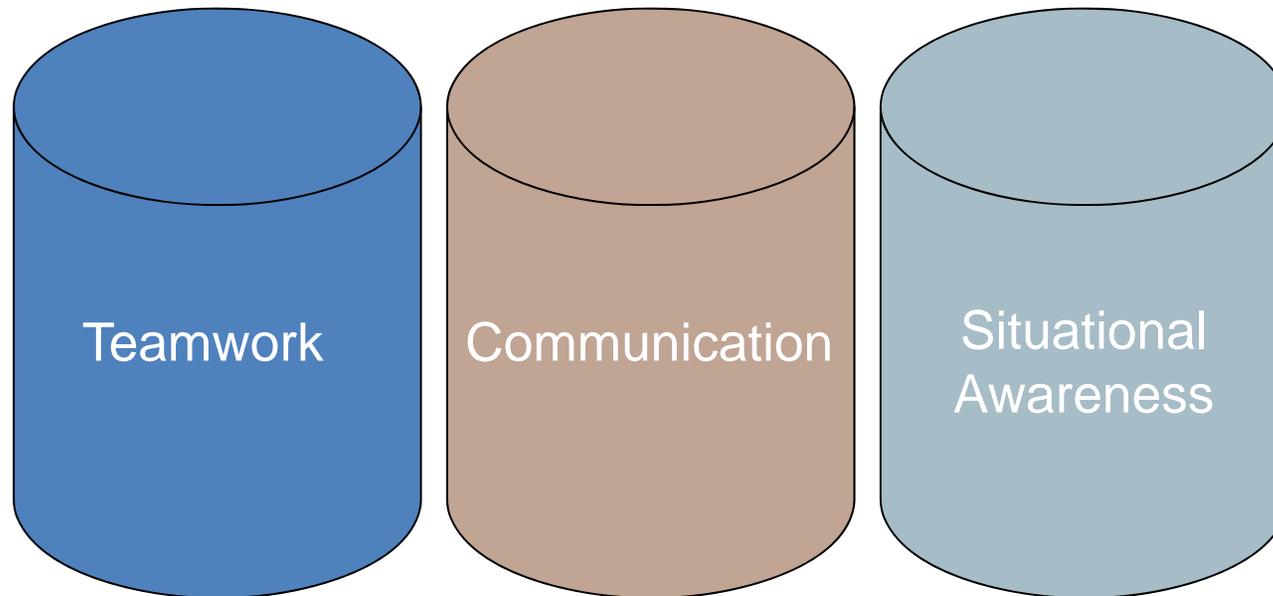
- Application to Design Professionals
- A management system which makes optimum use of all available resources – equipment, procedures and people – to increase best practices in an effort to minimize the frequency and severity of losses, increase performance, and promote client satisfaction and profitability
 - Minimize human error
 - Maximize human performance
 - Focus on human factors aka the Dirty Dozen



Design Resource Management



- Three pillars of Design Resource Management



Teamwork



- Leadership
 - Solicits input from team in order to enhance decision making
 - Fosters respectful communication
 - Facilitates conflict resolution and constructive feedback
 - Followership
 - Active participation and exercising independent thought
 - Obligation of follower in order to challenge leader
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Communication



- Cornerstone is communication
 - Clear, concise message that is confirmed
 - Includes all relevant information and prioritizes issues
 - Five components of clear communication
 - Inquiry
 - Advocacy
 - Listening
 - Conflict Resolution
 - Feedback
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Five Skills of Clear Communication

- Inquiry
 - Positive curiosity
 - Ask questions
 - Inquiry leads to error identification
 - Compare: the corporate automaton
 - Advocacy
 - Describes how to challenge a superior
 - “If you see something, say something”
 - Use the assertive statement – Todd Bishop Model
 - Address the individual – “Hey Chris.”
 - State your concern – “I’m concerned that this plan may be hard to read.”
 - State the problem as you see it – “A contractor could hit this existing gas line.”
 - State a solution – “Why don’t we call this out in bigger font with a larger arrow.”
 - Obtain agreement – “Does that sound good to you?”
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Five Skills of Clear Communication

- Listening
 - Perceiving verbal and nonverbal communication
 - Conflict resolution
 - Natural result of people thinking
 - Focus on what is right, not who is right
 - Feedback
 - Confirms understanding and comprehension
 - Action items
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Situational Awareness

- Paying attention to your surroundings / environment
 - Constantly updated through observation and communication
 - Seeing the big picture
 - Recognizing the warning signs of a claim
 - E.g., understanding GL coverage in a delay case
 - Knowing how your task fits into the project
 - Recognizing factors that lead to a loss of situational awareness
 - E.g., distraction: the danger of multi-tasking
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Factors That Lead to a Loss of Situational Awareness



Ambiguity	Open to more than one interpretation
Distraction	Attention drawn away from initial focus
Fixation	Focus on one item at the exclusion of others
Overload	Too busy to manage all tasks
Complacency	A false sense of comfort
Improper Procedure	Deviating from norms without justification
Unresolved Discrepancy	Failure to resolve conflicts



Developing Your Own Model

- How to create a cohesive team that effectively communicates in a manner that fosters situational awareness
 - Teamwork
 - Communication
 - Situational Awareness
 - Strong organizational culture
 - Emphasis on leadership opportunities
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Developing Your Own Model

- Strong organizational culture
 - Top down approach
 - Focus on building trust with senior management
 - Adopt a non-punitive policy toward mistakes
 - Leadership opportunities
 - Recognize and embrace employee diversity
 - Diverse skillsets
 - Finders v. grinders
 - Strike the right balance
 - Know what is going on in your employees' lives
 - Management situational awareness
 - Life changes / challenges
 - Stressors
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Leadership Opportunities

- Provide feedback to employees
 - Timely, direct, constructive
 - Regular check-ins
 - Provide opportunity to act
 - Year end review is too late
 - Solicit feedback from employees
 - Cultivate subordinates who will coach and advise
 - Acting on feedback builds trust and confidence
 - Creates better leaders
 - Succession planning
 - Retains talent and fosters continuity
 - Delegates authority freeing up time for management responsibilities
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Leadership Opportunities



- Leading Under Pressure
 - During crisis, subordinates watch and learn what you really believe
 - Accept responsibility for mistakes?
 - Support employees?
 - Cool and collected?
 - Stand up for what you believe?
 - “No matter how bad a situation is, you can always make it worse.”
 - Col. Chris Hadfield, An Astronaut’s Guide to Life on Earth

www.aerospaceguide.net





Leadership Opportunities

- Leading under pressure
 - “If your instinct is to shield yourself from blame, to take credit rather than sharing it with your subordinates, or to avoid admitting when you have made a mistake, you will give your employees license to do the same.”
 - Robert S. Kaplan; *What to Ask the Person in the Mirror*, Harvard Business Review Jan. 2007
 - Bad reactions encourage withholding of information
 - Fear shuts down a firm’s early warning system
 - Design Resource Management fosters positive dialogue about error recognition and hazard avoidance
 - Frame mistakes as teachable moments
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Leadership Opportunities

- Mentoring programs
 - Develops talent
 - Provides focused one on one assistance
 - Informal setting to address mutual expectations
 - Opportunity to promote core values and culture
 - Provide training and continuing education opportunities
 - Continue honing skillset
 - People want to advance
 - Cross train with other departments and disciplines
 - Understand contracting issues and insurance
 - Promote situational awareness
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Leadership Opportunities

- Find out what employees think
 - What are the relevant issues, thoughts and perceptions?
 - How to better motivate and foster a team approach
 - Mentor programs
 - Candid discussions
 - Team building exercises
 - Anonymous surveys
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Marketing Opportunities



- Promote Design Resource Management
 - Clients
 - Subconsultants
 - Integrated Project Delivery
 - Distinguish yourself in the market
 - Make a name for yourself
 - Increase best practices
 - Manage human error
 - Get paid
 - Have fun
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Resources

- Human Factors – faa.gov/regulations.policies/handbooks
 - Crew Resource Management: a positive change for the fire service – International Association of Fire Chiefs 2013
 - Culture, Error, and Crew Resource Management; Robert L. Helmreich, et al., Dept. of Psychology the University of Texas at Austin
 - What to Ask the Person in the Mirror; Robert S. Kaplan, The Harvard Business Review Jan. 2007
 - Crew Resource Management - Wikipedia
 - Asiana Airlines Flight 214 – Wikipedia
 - United Airlines Flight 173 – Wikipedia
 - Maj. J. Scott Stewart, USAF (retired)
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Disclaimer



- *There is no substitute for local expertise and we encourage you to review the general advice in this presentation with your local experts including lawyers, risk managers, brokers and underwriters. Nothing in this material is intended to constitute legal advice.*
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Questions?



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