

# CREW Resource Management

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Next Slide

# CRM

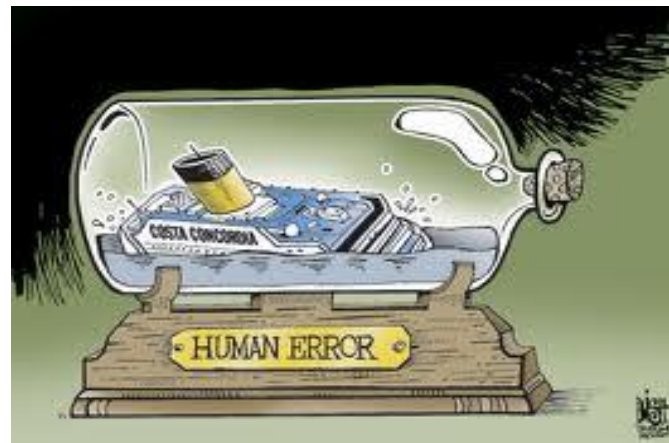
**Crew Resource Management(CRM) is a tool created to optimize human performance by reducing the effect of human error through the use of all resources.**

CRM focuses on interpersonal communication, leadership, and decision making

# Where did CRM start

The history of Crew Resource Management began upon the aviation industry's surrender to 2 fundamental and incontrovertible realities:

- 1) Human beings are fallible and will inevitably make mistakes
- 2) Human beings are individuals, with a rich diversity of personalities, cultural backgrounds, talents and skills.



# CRM

## The Start

- **Aviation accidents**
  - **Found to have common causes**
    - **70% of accidents caused by human error**
      - Preoccupation with minor mechanical problems
      - Inadequate leadership
      - Failure
        - » To delegate tasks and assign responsibilities
        - » To set priorities
        - » To utilize available data
        - » To communicate intent and plans



# CRM

## NASA Workshop

- **Resource Management on the Flight Deck**
  - Identified the human error aspects of the majority of aircraft crashes at that time
  - **Failures of:**
    - Interpersonal communication
    - Decision making
    - Leadership
  - **New term**
    - Cockpit Resource Management (CRM)
      - » Applied to process of training crews to reduce “pilot error” through better use of human resources on the flightdeck



# CRM Evolution



**UNITED**

- **Generations**

- **1st generation**

- **Introduced by United Airlines**

- Geared towards diagnosing personal managerial styles

- **Emphasized**

- Changing individual styles & correcting deficiencies in behavior

- » Lack of assertiveness by junior officers

- » Authoritarian behavior by senior officers (Captains)

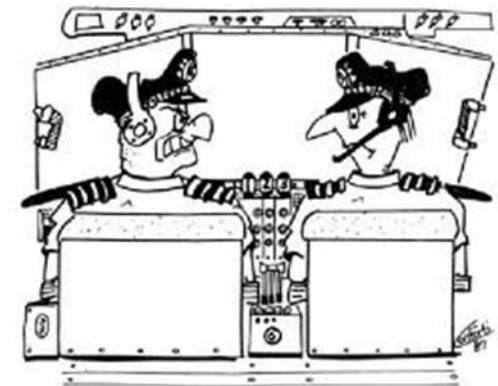
- Sr pilots deemed training as “Charm School”

- **National Transportation Safety Board (NTSB)**

- Singled out lack of assertiveness

- » From Copilot

- » Flight Engineer



# CRM Evolution

- **2nd generation**
  - 2nd workshop
  - More airlines started CRM programs
  - Training to become part of flight training, continuous career training
- **Name change**
  - Crew Resource Management
  - Focuses on cockpit group dynamics
- **3rd generation**
  - Program now includes recognition and assessment of human factors issues

# CRM Evolution

- **Generations**

- **4th generation**

- Developed to solve human error problems

- **5th generation**

- **CRM seen as set of error countermeasures with 3 lines of defense**
  - 1. Avoid error
  - 2. Trap emerging errors before they are committed
  - 3. Mitigate consequences of error that weren't trapped





# Aviation

- **Current uses of CRM**
  - **Aviation**
    - **Part of core training for entire career**
      - Attitudes changed towards
        - » Junior crew members
        - » All crew members have equal say
        - » “Flight attendants prepare for takeoff and cross check”
        - » Captain has final say



- **Military**
  - Annual training / career training
    - » CRM flight (simulator)
      - Problems are introduced to see how the crew interacts to solve problems
      - Each crew member has right to challenge a decision
      - TIME OUT – KNOCK IT OFF
      - Pilot has the final say



# Medical

- **Current uses of CRM**

- **Medical**

- **CRM = Crisis Resource Management**

- Primarily used in high-acuity environments
  - » Operating rooms, intensive care units, emergency rooms

- **Roles**

- Leader/Event manager
- Members/Followers
  - » Communication
    - SBAR
  - » Global Assessment
  - » Resources and support structures
- “In those medical facilities that have embraced CRM, there has been reported a tenfold reduction in wrong site surgeries as well as very significant reductions in other patient care errors”. Solosky, K.



# 1<sup>st</sup> Responders

- **Current uses of CRM**
  - **1<sup>st</sup> Responders (Fire)**
    - **CRM = Crisis Resource Management**
      - Used in all tasks
        - » Fires, Natural Disasters, Floods, etc...
    - **Teamwork / Roles**
      - Leader
      - Follower
    - **Decision making**
      - Traditional
      - Fire Service
      - “If we continue on the current LODD/injury path, the fire service will experience 1000 fatalities and 100,000 injuries in the next ten years”.



# 5 Step process

Todd Bishop 5 step assertive statement process

- **1. Opening or attention getter - Address the individual**
  - "Hey Chief," or "Captain Smith," or "Bob," or whatever name or title will get the person's attention.
- **2. State your concern –**
  - Express your analysis of the situation in a direct manner while owning your emotions about it.
    - "I'm concerned that we may not have enough fuel to fly around this storm system," or "I'm worried that the roof might collapse."



## 5 Step process

- **3. State the problem as you see it –**
  - "We're only showing 40 minutes of fuel left," or "This building has a lightweight steel truss roof, and we may have fire extension into the roof structure."
- **4. State a solution –**
  - "Let's divert to another airport and refuel," or "I think we should pull some tiles and take a look with the thermal imaging camera before we commit crews inside."



## 5 Step process

- **5. Obtain agreement (or buy-in) –**
  - **"Does that sound good to you, Captain?"**
- These are often difficult skills to master, as they may require significant changes in personal habits, interpersonal dynamics, and organizational culture.



# Case study

## Airblue Flight 202

- **Airbus 321-231 narrow body aircraft**
  - Operated by a Pakistani crew
  - Aircraft crashed in the mountains approximately 8 nmi (15 km) north of the airport
  - Deadliest aviation accident in Pakistan to date (2010)
  - 152 deceased
- **Crew**
  - Pilot- 62, very experienced, 35 yrs flying, over 25,000 hrs
  - Copilot, former F-16 pilot, 1 yr experience on Airbus

# Case study

## Airblue Flight 202

- Investigation

- The report issued by Pakistan's Civil Aviation Authority cited a lack of professionalism in the cockpit crew along with poor weather as primary factors in the crash.
- The report noted that the captain ignored or did not properly respond to a multitude of Air Traffic Control directives and automated cabin warning systems.
- The report also claimed that the first officer passively accepted the captain's actions, after the captain on multiple occasions took a "harsh, snobbish and contrary" tone with the first officer and "berated" him.



# CRM

## Future uses (Electric Industry)

- **Transmission Operations**
  - **Shift Supervisor / RC**
    - **Leader**
      - Authority
      - Mentoring
      - Conflict Resolution
  - **Desk qualified Operators**
    - **Followers**
      - Respect Authority
      - Ego in check
      - Assertiveness/Authority
  - **Situational leadership**





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