



Airline Wet Drill



Welcome all to the class

Lecturers

- Dr. Theppaluk Komolvaniij
- Theppaluk.ko@ssru.ac.th



Rules and Regulations

- Respect to yourself and to each other
- Being HONEST at all times/things you do
- All students MUST attend the class more than 80% (3 times missing without properly reason, please contact at One-Stop Service to Withdraw)
- All students MUST apply to the uniform standard rules and regulations at all times in University (Except online course)
- No Food or Drink in the classroom (Except online course)



Assessment

- Morality and Ethics
(Attendance/Honesty/Punctuality/Conscience/etc.) 10%
- In-class quizzes 10%
- Individual Presentation 10%
- Group Presentation (15+5) 20%
- Mid-term Examination 20%
- Final Examination 30%
- Total 100%**
- **Remark: Assignments rely on the situations*



Individual Assignment-01

- ‘Report on how different geographical locations (e.g., Arctic, tropical, coastal) affect ditching procedures and survival strategies’, make a 1 minute video clip, due before 15SEP25
- (10 points = English usage + Timing 5, Presentation skill + Creativity 5)



Individual Assignment-02

- Summarize all the QR codes video clip, each content 1 page of A4, then move to the next page for next content, total of 5 pages A4, Times New Roman; font 14, due before 15SEP25
- (10 points = English usage 5 + Timing 5)



Group Assignment

- ‘Design a passenger safety card specifically for ditching situations.’
- Make a 3 minutes video clip with clear steps of making the safety card with the backstage and a real safety card, submit before 30SEP25
- (15 points = English usage + Timing 5, Presentation skill + Creativity 5, Reality useful 5)
- (5 points = Team Voting)



Break for 10 minutes



Introduction to Airline Wet Drill



Welcome all to the class

Topics

- Definition and overview of ditching
- Historical context and notable ditching incidents
- Importance of understanding ditching in aviation safety



Definition and overview of ditching

Definition of Ditching

- Definition: Ditching refers to an emergency landing of an aircraft on water
- Purpose: It is performed when landing on a runway is not possible due to various emergencies such as engine failure, fuel exhaustion, or other critical issues



Definition and overview of ditching

Types of Aircraft

- **Commercial Airliners:** Large passenger planes with multiple engines, such as Boeing 747, Airbus A320
- **General Aviation Aircraft:** Smaller planes including single-engine and light twin-engine aircraft
- **Military Aircraft:** Designed for combat and transport purposes, which may also require ditching in emergencies



Definition and overview of ditching

Types of Ditching

- **Prepared Ditching:** The Captain acknowledge about the situation is coming up and there is time valid for preparation
- **Ditching:** The Captain acknowledge about the situation is coming up and there is not any time valid for preparation



Definition and overview of ditching

Circumstances Leading to Ditching

- **Engine Failure:** Complete loss of engine power that prevents reaching a nearby airport
- **Fuel Exhaustion:** Running out of fuel due to miscalculation, fuel leak, or unforeseen delays
- **Structural Damage:** Severe damage to the aircraft structure making it unsafe to continue flying
- **Fire or Smoke:** In-flight fire or smoke that necessitates an immediate landing
- **Pilot Incapacitation:** In cases where the pilot is unable to continue flying, leading to an emergency water landing



Definition and overview of ditching

Historical Context

- **Well-known Ditching Incidents**
 - **US Airways Flight 1549 (2009):** Also known as the "Miracle on the Hudson," successfully ditched in the Hudson River after bird strikes caused dual engine failure
 - **Pan Am Flight 6 (1956):** Ditching in the Pacific Ocean due to engine failure, with successful rescue of all passengers and crew
- **Evolution of Ditching Procedures**
 - **Early Years:** Initial ditching procedures were less standardized, relying heavily on pilot skill and improvisation
 - **Modern Era:** Comprehensive training programs, standardized procedures, and improved aircraft design to enhance ditching survivability



Definition and overview of ditching

Aircraft Design and Safety Features

- **Aircraft Design for Ditching**
 - **Floatation Devices:** Life vests, life rafts, and slide/rafts available on board for passengers and crew
 - **Water-tight Compartments:** Some aircraft are designed with water-tight compartments to prevent immediate sinking
 - **Structural Strength:** Reinforced fuselage to withstand impact with water
- **Emergency Equipment**
 - **Life Vests:** Located under seats or in seat pockets, equipped with lights and whistles for visibility and signaling
 - **Life Rafts:** Stored in overhead compartments or under seats, capable of carrying multiple passengers
 - **Emergency Locator Transmitter (ELT):** Sends distress signals to aid in rescue operations



Definition and overview of ditching

Ditching Procedures

- **Pilot Training and Procedures**
 - **Pre-ditching Preparation:** Assessing the situation, communicating with air traffic control, and informing passengers and crew
 - **Passenger Briefing:** Instructions on brace positions, use of life vests, and evacuation procedures
 - **Controlled Approach:** Managing descent and aiming for a controlled approach to minimize impact forces
 - **Touchdown:** Optimal touchdown involves landing parallel to waves to reduce impact and potential damage
- **Crew Coordination and Responsibilities**
 - **Flight Deck Crew:** Handling aircraft control, decision-making, and communication with emergency services
 - **Cabin Crew:** Guiding passengers through emergency procedures, ensuring the use of safety equipment, and managing orderly evacuation



Definition and overview of ditching

Post-Ditch Survival and Rescue

- **Immediate Actions After Ditching**

- **Evacuation:** Rapid evacuation of passengers and crew using slide/rafts or over-wing exits
- **Deployment of Life Rafts:** Ensuring passengers board life rafts and stay together for visibility and mutual support
- **Use of ELT and Signaling Devices:** Activating distress signals and using flares or whistles to attract rescuers

- **Survival Strategies**

- **Hypothermia Prevention:** Keeping warm with available resources, minimizing exposure to cold water
- **Hydration and Nutrition:** Rationing emergency supplies and staying hydrated
- **Group Cohesion:** Staying together to increase chances of being spotted by rescuers and to provide mutual support

- **Rescue Operations**

- **Search and Rescue (SAR):** Coordination with maritime and aviation SAR units for prompt location and rescue
- **Medical Attention:** Immediate medical assessment and treatment for injuries, hypothermia, and other health issues



Definition and overview of ditching

Regulatory and Training Requirements

- **Regulatory Standards**
 - **International Civil Aviation Organization (ICAO):** Sets global standards for ditching procedures and equipment
 - **Federal Aviation Administration (FAA):** Enforces regulations for US airlines, including mandatory ditching training and equipment
- **Training Programs**
 - **Simulated Ditching Exercises:** Conducted in training facilities using realistic simulators
 - **Crew Resource Management (CRM):** Training to enhance communication, decision-making, and teamwork during emergencies
 - **Passenger Safety Briefings:** Regular drills and safety briefings for passengers to familiarize them with ditching procedures



Break for 10 minutes



Historical Context and Notable Ditching Incidents

Early History of Ditching

- **World War II Era:** The concept of ditching became more prominent during World War II due to the extensive use of military aircraft over vast ocean areas. Pilots were trained for emergency water landings if their planes were damaged or ran out of fuel



Historical Context and Notable Ditching Incidents

Notable Ditching Incidents

- **Pan Am Flight 6 (1956)**
 - **Aircraft:** Boeing 377 Stratocruiser
 - **Cause:** Engine failure over the Pacific Ocean
 - **Outcome:** Successfully ditched; all 31 passengers and crew were rescued by the US Coast Guard
 - **Significance:** Highlighted the importance of pilot training and coordination with rescue services
- **ALM Flight 980 (1970)**
 - **Aircraft:** DC-9
 - **Cause:** Fuel exhaustion after multiple landing attempts in poor weather
 - **Outcome:** Ditching near the Virgin Islands; 40 out of 63 passengers and crew survived
 - **Significance:** Led to improvements in fuel management protocols and emergency preparedness



Historical Context and Notable Ditching Incidents

Notable Ditching Incidents

- **Aloha Airlines Flight 243 (1988)**
 - **Aircraft:** Boeing 737
 - **Cause:** Explosive decompression due to structural failure
 - **Outcome:** Despite significant damage, the aircraft managed to land safely on the runway, showcasing the critical nature of structural integrity
 - **Significance:** While not a ditching, it underscored the importance of maintenance and inspection in preventing emergencies that could lead to ditching



Historical Context and Notable Ditching Incidents

Notable Ditching Incidents

- **US Airways Flight 1549 (2009)**
 - **Aircraft:** Airbus A320
 - **Cause:** Bird strike resulting in dual engine failure
 - **Outcome:** Successfully ditched in the Hudson River; all 155 passengers and crew survived
 - **Significance:** Known as the "Miracle on the Hudson," it demonstrated exemplary pilot skill, crew coordination, and effective passenger evacuation procedures
- **Ethiopian Airlines Flight 961 (1996)**
 - **Aircraft:** Boeing 767
 - **Cause:** Hijacking leading to fuel exhaustion
 - **Outcome:** Ditched off the coast of the Comoros Islands; 50 out of 175 passengers and crew survived
 - **Significance:** Highlighted the complexities of dealing with non-technical emergencies and the need for robust security measures

Importance of Understanding Ditching in Aviation Safety

- **Enhancing Survival Rates**
 - **Training:** Comprehensive training for pilots and cabin crew on ditching procedures significantly increases the chances of survival
 - **Equipment:** Ensuring that aircraft are equipped with appropriate safety gear, such as life vests, rafts, and emergency locator transmitters
- **Improving Emergency Response**
 - **Coordination:** Effective communication and coordination between the flight crew, air traffic control, and rescue services are vital during a ditching event
 - **Preparedness:** Regular drills and simulations help in preparing crews for real-life scenarios, ensuring quick and efficient responses

Importance of Understanding Ditching in Aviation Safety

- **Passenger Safety and Confidence**
 - **Briefings:** Informing passengers about emergency procedures and the use of safety equipment fosters confidence and reduces panic during actual emergencies
 - **Awareness:** Understanding the importance of ditching procedures and how to respond can save lives in critical situations
- **Regulatory Compliance**
 - **Standards:** Adhering to international and national regulations, such as those set by ICAO and FAA, ensures that airlines maintain high safety standards
 - **Inspections:** Regular inspections and audits help identify and rectify potential safety issues before they lead to emergencies

Importance of Understanding Ditching in Aviation Safety

- **Technological Advancements**
 - **Design Improvements:** Continuous advancements in aircraft design, such as reinforced fuselages and improved flotation devices, enhance the survivability of ditching incidents
 - **Innovation:** Integration of modern technology, such as real-time data transmission and advanced communication systems, aids in better management of emergencies
- **Learning from Past Incidents**
 - **Analysis:** Detailed investigation and analysis of past ditching incidents provide valuable insights into what went wrong and what worked well
 - **Improvements:** Implementing recommendations from incident investigations leads to improvements in procedures, training, and equipment



Importance of Understanding Ditching in Aviation Safety

- **Psychological Preparedness**
 - **Crew Training:** Ensuring that flight crews are psychologically prepared to handle the stress and pressure of an emergency landing on water
 - **Passenger Education:** Providing passengers with clear and calm instructions during an emergency can significantly impact their ability to respond effectively
- **Mitigating Risks**
 - **Proactive Measures:** Identifying potential risks and implementing proactive measures can prevent situations that might lead to ditching
 - **Scenario Planning:** Considering various scenarios during flight planning helps in preparing for unexpected events



Q & A