Airline Wet Drill

Aircraft Design Considerations for Wet Drill

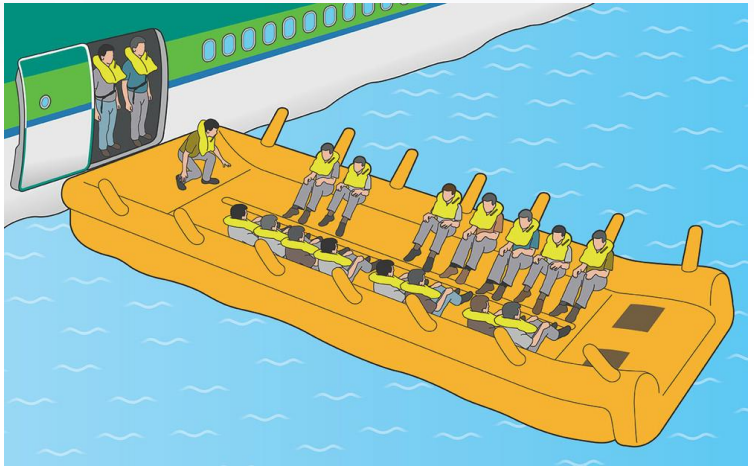
Welcome all to the class

Topics

- Aircraft design considerations for ditching
- Structural integrity and buoyancy
- Modifications and features to aid in ditching (e.g., life rafts, flotation devices)

Welcome all to the class

Aircraft with Slide/Raft



- *Source: Aviation International News, Aviation Stack Exchange*

Aircraft design considerations for ditching

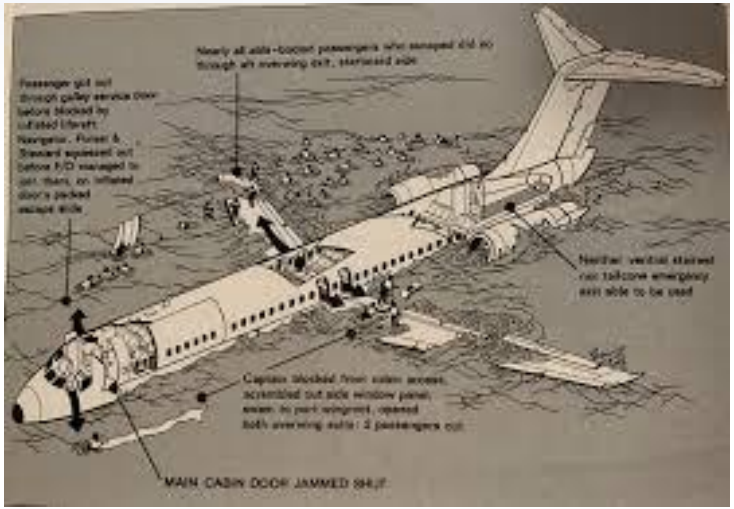
1. Structural Integrity and Buoyancy

- **Structural Integrity:**
- **Material Strength:** Aircraft are designed with materials that can withstand the impact forces of a ditching event. This includes reinforced fuselage sections and the use of composites and alloys that offer high strength-to-weight ratios.
- **Compartmentalization:** Aircraft are often designed with compartments that can remain watertight to prevent flooding and maintain buoyancy. For instance, the fuselage might be sectioned into multiple watertight compartments.
- **Crushable Structures:** Some parts of the aircraft are designed to absorb impact energy through controlled deformation, reducing the forces transmitted to occupants.

Aircraft design considerations for ditching

1. Structural Integrity and Buoyancy

- **Buoyancy:**
- **Wing Tanks and Sealed Sections:** Fuel tanks and certain sections of the wings can be sealed off to provide additional buoyancy. The design ensures that these sections do not flood immediately upon ditching.
- **Fuselage Design:** The shape and design of the fuselage can help in keeping the aircraft afloat. For example, a rounded bottom can help distribute the impact forces and improve buoyancy.



Source: Admiral Cloudberg - Medium

Aircraft design considerations for ditching

1. Structural Integrity and Buoyancy

- **Real-World Example:**
- The Hudson River landing of US Airways Flight 1549 in 2009 is a prime example of successful ditching. The Airbus A320's design played a crucial role in maintaining buoyancy long enough for passengers to evacuate safely.


Break for 10 minutes

Aircraft design considerations for ditching

2. Modifications and Features to Aid in Ditching

- **Life Rafts:**
- **Deployment Mechanism:** Life rafts are typically stored in easily accessible compartments and are equipped with automatic inflation systems that activate upon contact with water or manual deployment.
- **Capacity and Supplies:** They are designed to accommodate a specific number of passengers and come with essential survival supplies, including water, food, first aid kits, and signaling devices.

Aircraft design considerations for ditching

2. Modifications and Features to Aid in Ditching

- **Flotation Devices:**
- **Personal Flotation Devices (PFDs):** Each passenger seat is equipped with life vests that are designed to be easily accessible and quickly donned. These vests often include lights and whistles to aid in rescue.
- **Slide/Rafts:** Evacuation slides that double as life rafts are a common feature. These are equipped with ropes and stabilizing systems to keep them steady in rough waters.

Aircraft design considerations for ditching

2. Modifications and Features to Aid in Ditching

- **Other Modifications and Features:**
- **Emergency Lighting:** Aircraft are fitted with emergency lighting that helps guide passengers to exits in low-visibility conditions, crucial during a ditching event.
- **Exit Doors and Hatches:** These are designed to be operable in water, with markings and instructions that are visible and straightforward to use even in emergencies.
- **Beacon and Signaling Devices:** Aircraft are equipped with Emergency Locator Transmitters (ELTs) that activate upon impact with water, sending distress signals to aid in location and rescue operations.

Aircraft design considerations for ditching

2. Modifications and Features to Aid in Ditching

- **Real-World Example:**
- Modern commercial aircraft, like the Boeing 787 and Airbus A350, are equipped with advanced ditching features, including slide/rafts and enhanced structural designs to aid in buoyancy and survivability during water landings.

Source: FAA Survival Kit – FL220


Q & A