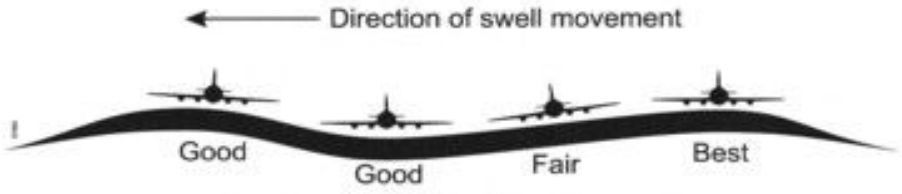
Aircraft Ditching

- Set the transponder to 7700 for distress.
- Notify ATS of situation, position, and ditching intentions
  - ☐ normally this will be done on the *en-route* air traffic control frequency or 121.5/243.0 MHz
  - ☐ if two-way communications are not established, transmit in the blind
  - ☐ if the aircraft is equipped with HF radio, ask ATS to have SAR authorities alert ships in the vicinity and have those ships attempt communications with the aircraft on 4125 kHz.

- If bailing out is an option, determine whether this would be safer than ditching.
  - ☐ military fighter aircraft, due to their high landing speed and small size, often react violently to ditching
  - ☐ military bombers, because of their relatively weak bottom due to large bomb-bay doors, can break apart under the forces encountered in ditching
  - ☐ for both of these aircraft types, it usually is better to bail out rather than ditch
  - ☐ most other types of aircraft have been ditched successfully
  - ☐ ditching performance is best in pressurized, low-wing aircraft without large underslung engine nacelles or long afterbodies.
- Determine the primary and secondary swell directions.
  - ☐ primary swell will be visible during day visual meteorological conditions (VMC) from an altitude of 2000 feet or higher
  - ☐ swells are generated by distant weather systems and do not break
  - ☐ the primary swell system will appear as a definite pattern or differences in light intensity on the surface
  - ☐ watch the pattern for a few moments, the direction of motion can be determined
  - ☐ at night or under IMC, this information may be available from surface ships in the area
  - ☐ the secondary swell system, if present, may not be visible until the altitude is between 1500 and 800 feet.
- Determine surface wind direction and speed.
  - ☐ examine local wind effects on the water
  - ☐ whitecaps fall forward with the wind, but are overrun by waves, thus producing the illusion that the foam is sliding backward. Plan to land in the same direction that the whitecaps are moving unless the swells are large.
  - ☐ wind velocity can be accurately estimated by noting the appearance of the whitecaps, foam, and wind streaks
  - ☐ the Beaufort scale is provided at the end of this discussion for wind velocity and wave heights.

- Verify wind and swell analysis.
  - when flying at low altitude above the water the seas will appear to be steep, fast, and rough when heading into them
  - when flying down or parallel to the seas, the surface appears to be more calm.
- Jettison cargo and fuel, but retain sufficient fuel for landing under power.
- Ensure that seat belts and harnesses are properly secured.
- Determine the best heading for ditching.
  - The figure below shows a landing parallel with the swell. This is the best ditching heading; landing on the top or back side of the swell is preferable.



Landing parallel with the swell

  - the best ditching heading usually is parallel to the primary swell system and down the secondary swell system
  - the next best choice is parallel to the secondary swell system and down the primary swell system
  - the choice between these two options is determined by which will give the greatest headwind component
  - try to land with the wind on the opposite side to the passenger door; this more-sheltered side may make opening the door and subsequent exit by passengers easier.
- Never land into the face (or within 35° of the face) of a primary swell unless the surface winds are an appreciable percentage of the aircraft stalling speed in the ditching configuration.

Winds 0–25 knots

  - ignore the crosswind component and land parallel to the primary swell, using the heading that has the greatest headwind component

- ☐ if a pronounced secondary swell exists, it may be desirable to land down the secondary system and accept some tailwind component

Winds above 25 knots

- ☐ it may be necessary to select a heading neither parallel to the swell (since the crosswind component may make for unacceptable control at slow airspeeds) nor into the wind (because the ground-speed reduction due to the headwind will not compensate for the disadvantage of landing into the swell)
- ☐ a heading at an angle into the wind and primary swell is indicated, with more of a crosswind component accepted the higher the swells and more of a headwind component taken the higher the winds with respect to the aircraft stalling speed
- ☐ when landing parallel to a swell system, it is best to land on the crest; it is acceptable to land on the back-side or in the trough
- ☐ landing on the face of the swell should be avoided
- ☐ if forced to land into a swell, touchdown should be just after passage of the crest.

Landing on the back side of a swell

- Turn to the ditching heading and begin letdown.
  - ☐ flaps should be fully extended
  - ☐ the landing gear should be left retracted.
- When at a low altitude, slow to touchdown speed, 5 to 10 knots above the stall.
- Use power to maintain a minimal (no more than 300 feet per minute) rate of descent and approximate 10° nose-up attitude.
  - ☐ the kinetic energy to be dissipated, and resulting deceleration, increase with the SQUARE of the velocity at touchdown
  - ☐ when over smooth water or at night it is very easy to misjudge the height over the water. This technique minimizes the chance of

misjudging the altitude, stalling the aircraft, and entering the water in a disastrous nose-down attitude

- □ the proper use of power on the approach is extremely important
- □ if power is available on one side only, a little power should be used to flatten the approach; a balance will need to be achieved between the need to impact the water as slowly as possible and the loss of control that can occur with sudden application of unbalanced power at an airspeed near the stall.

- Pick a touchdown spot.
  - □ the pilot should observe the sea surface ahead
  - □ shadows and whitecaps close together indicate that the seas are short and rough
  - □ touchdown in those areas should be avoided
  - □ touchdown should be in an area (only about 150 metres is needed) where the shadows and whitecaps are not so numerous.
- Cut the power and brace for impact.
  - □ maintain airspeed at 5 to 10 knots above the stall; do NOT let the aircraft stall; do not flare the landing
  - □ if necessary to keep the proper nose-up attitude, keep power until the tail touches the surface
  - □ keep the wings level.
- Evacuate the aircraft as rapidly as possible after all motion has stopped.
  - □ passengers should remain strapped into their seats until the inrush of water, if any, has subsided, in order to avoid being swept around the cabin
  - □ helicopters are prone to roll inverted except in very calm water, even if equipped with flotation devices
  - □ in order to avoid disorientation, occupants should identify and hold onto a reference until ready to exit the aircraft
  - □ lifejackets must not be inflated until clear of the aircraft.

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