HOW TO PREPARE FOR A DITCHING

Aviation Egress Situation:
Have you ever given thought to what you would do if you found yourself strapped in upside down in a sinking aircraft? Imagine flying along on a nice warm day, the next moment, being trapped inside an aircraft with cold water rushing in. It's very dark, you can't breathe, and if you're not prepared your chances of survival are reduced dramatically.

Very little emphasis is placed on aircraft ditching and underwater egress training, yet every year people die in aircraft accidents that terminate in the water. You don't have to fly over open bodies of water to be involved in a ditching. In fact, the United States Coast Guard says that on the average, there's a ditching once a day in the continental United States. Most of these are precipitated by instances such as fuel shortage, persistent engine or cabin fire, engine failure, flight control problem, or pilot error to name a few.

The following are some basic guidelines to help you prepare in the event you should ever find yourself faced with a ditching situation. A ditching checklist for your particular aircraft should be made up ahead of time. Some actions to consider are:

- · **Transmit a MADAY:** Immediately upon recognition that a ditching may occur, transmit a MADAY. Your location is the most vital information to transmit. The sooner somebody is notified, the faster you will be rescued and the more likely you will be rescued alive.
- · **Fly the Aircraft:** If altitude permits, fly an airspeed for a minimum rate-of-descent or best endurance speed, as this will give you some extra time to prepare. Once you have prepared as best you can and are within approximately 1000 ft. of the water surface, you should resume a normal approach speed which will set you up at a familiar rate-of-descent for your ditching.
- · **Transponder:** Set to 7700.
- · **ELT:** Select to ON.
- · **Configure Aircraft:** High wing aircraft should generally be ditched with full flaps to reduce the speed. Low wing aircraft should leave the flaps retracted to prevent them from contacting the water first, which can cause the aircraft to pitch nose down, and possibly causing it to flip over on it's back. If able, retract landing gear. If power is available, use it to make a shallow approach low over the water at 5 to 10 kts above stall. Without power, caution should be taken to avoid a full stall prior to ditching.
- · **Brief crew and/or passengers:** Life vest, brace position, loose articles sharp objects etc.
- · **Don life vests:** Quickly donning a life vest in the tight confines of the typical cockpit can be difficult. It is recommended that you always wear your life vest while over water. Stress to passengers the importance of NOT inflating the vest until completely clear of the aircraft. An inflated vest will have positive buoyancy and it's going to be very difficult, if not impossible, to reach your exit if your exit is underwater. An analogy would be like trying to swim to the bottom of a pool with an inflated life vest on.
- · **Unlock or open exits:** You may want to unlock and/or open the door(s) and jam something into the opening so as to prevent closing again on impact. If left closed, deformation of the structure on impact could make it impossible to open the door.

- · **Secure loose articles:** Remove and stow any objects that may impede or complicate your escape such as kneeboards, ties, newspapers, headsets, carry on baggage, GPS cords etc.
- · **Restraint system:** Lock your shoulder harness and cinch down your lap belts.
- · **Ram Air Vents:** Close to prevent water entering the cockpit/cabin through air ventilation system.
- · **Locate major swell:** Determine wind velocity and direction. Conventional wisdom is that the swell direction is normally more important than wind direction when planning a ditching. Plan your approach to land along or parallel to the primary swell, not across it, even if this means accepting a crosswind. To reduce the chance of a wingtip digging into the water, the best location is to land along the crest of the swell. With smooth water surfaces, depth perception is greatly affected, making it difficult to determine height. If this occurs, or a night ditching is required, the United States Coast Guard recommends maintaining a 9 degree to 12 degree nose-up attitude and 10 to 20 percent above stall until contact with the water is made.
- · **Brace for impact:** The brace position reduces flailing of the head, arms, upper torso and the legs to prevent injury.

It is important to maintain control of the aircraft as long as possible until the aircraft contacts the water. It is usually unpredictable how fast your aircraft will sink once it is on the water so exit as quickly as possible. If the aircraft is partly submerged, you may have to wait for the cabin/cockpit to fill partially with water to allow the pressure to equalize before you are able to open the doors.

What You Should Know … Steps That May Save Your Life!

For many, the most difficult part of surviving a ditching accident is an underwater egress. When reviewing accident reports, they indicate many people survive the initial impact however, needlessly drown because they were not able to extricate themselves from the aircraft. A recent Canadian Transportation Safety Board study of survivability in seaplane accidents suggested that fatalities in seaplane accidents terminating in the water are frequently the result of post-impact drowning. Most drownings occur inside the cabin of the aircraft and those who survived often found difficulty in exiting the aircraft. In fact, over two-thirds of the deaths occurred when occupants who were not incapacitated during the impact drowned.

Panic, disorientation, unfamiliarity with escape hatches and lack of proper training are some of the major factors that contribute to people drowning. Why people encounter such difficulties when trying to get out of an aircraft that has submerged can, in some cases, be traced back to learned behaviour traits that are inappropriate for this type of situation***. In an emergency situation we tend to react, and don't think. The way we have done things in the past become habit and often that's the way we're going to react.***

For example, when getting out of a car, most people release their seat belt first before opening the door. We do this without even thinking, it's automatic. If we are strapped into an aircraft that is sinking, a common reaction is to first release our seat belt, then try to get out. We have reverted to a learned behavior that we have developed each time we get out of our car. This simple procedure may prove disastrous in an underwater egress situation.

In many accidents, people have hastily and prematurely removed their seat belts and as a result, have been moved around the inside of the aircraft due to the in-rushing water. With the lack of gravitational reference, disorientation can rapidly overwhelm a person. The end result is panic and the inability to carry out a simple procedure to find their way out of the aircraft.

Before releasing our seat belt, we need to stay strapped in our seat until the in-rush of water has stopped, our exit is identified and we have grabbed a reference point. As long as we are strapped in our seated position, we have a reference point relative to our exit which will combat disorientation. Also, if we need to push or pull open our exit, it will be a lot easier if we are still strapped in our seat.

Be familiar with your exits and door handles and know how to use them with your eyes closed. This piece of advice may seem a no brainer, but something very simple can cause us problems. Again, think about our car example, opening the door from the inside is not considered a difficult manoeuvre. Now think back to a time when you've been in someone else's car or a rental car and you have wanted to get out but either couldn't locate or operate the door handle immediately.

All that is needed is a slight change to something you're not familiar with and now if you're submerged upside down in the dark, freezing water, this simple task suddenly becomes monumental. If your life depended on it, could you do it? It's easy to see how quickly simple procedures we automatically do every day can negatively compound in an underwater egress emergency if we haven't trained and developed new behaviour traits to overcome these barriers.

To help prevent panic and disorientation, we teach the following 5 simple steps to follow in the event you are faced with an underwater egress situation:

Stay Calm/ Wait for the motion to stop: No matter if you are submerging right side up or upside down, the key to a successful egress is remaining calm. Wait for the motion to stop (count up to 5 seconds). This will also give you an opportunity to think about what you are going to do next. Be prepared for the possibility of cold shock if the in-rush of water that floods the cabin is ice cold. Your body's initial reaction to sudden immersion in cold water may cause exhalation of air, consequently you may involuntarily inhale some water. Don't release your seat belt and shoulder harness until you are ready to exit. If you release your seat belt prematurely, the in-rush of water may push you around and contribute to disorientation.

Open/Identify Your Exit: Have a plan or mental roadmap of how you're going to locate your exit. To find the exit handle, put your hand on your knee, knee against the cabin wall, feel your way along until you find something you recognize like the armrest or a door seam, and work up from there to the exit handle. Be familiar with your exits and door handles and know how to use them beforehand. Everyone on board should have that tactile experience and know how the doors work.

Grab Hold of Reference Point: Grab a reference point that you are familiar with in the direction of your exit. Don't release your belt without having hold of a reference point. You should always have one hand on a reference point and don't let go before you grip another.

Release Your Seat Belt/Harness: Once the exit is open, keep a hold on that reference point, release your belt with the other hand and pull yourself through your exit. Never let go until you are out.

Pull Yourself Out: Resist the urge to frantically kick as you may become entangled in any loose wires or debris. If you're stuck, don't panic, try backing up a bit and rotating a little before proceeding.

Once you're clear of the aircraft, the next thing you want to do is find a way to the surface. This can be difficult particularly if you lack positive buoyancy that would normally cause you to float to the surface of the water. How do you know which way is up? If you are able to release air bubbles, even if it's dark, you may be able to sense which way the bubbles are going. If you feel increased pressure on your ears, this may indicate that you're swimming in the wrong direction. Certainly if you're wearing a life vest, inflate it. As you'll be rising rapidly in the water, hold one hand above your head as you surface to make sure you don't come in contact with any wreckage and/or debris.

Remember that training and preparation is the key to survival. By practicing the skills for ditching and underwater egress, it can become second nature, ingrained in your sub-conscious and may prevent you from becoming another one of the many people who die each year in this unforgiving situation. Knowledge and preparation is your best safety net.

Do You Know How To Exit A Plane Underwater?

"I never realized how hard it is to swim with your clothes on", says administrative assistant Tina Couillard. Tina and co-workers at Johnstone Strait spent a day at the local swimming pool where Pro Aviation Safety Training put on an "Aircraft Ditching, Sea Survival" course at the invitation of operations engineer Tom Miller. Four TW employees and a contract scaler had a close call in October, when the floatplane they were in struck a boomstick in Knox Bay and started sinking. Tina helped handle the emergency that day.

"The escape training is designed to train passengers in underwater egress in the event of an aircraft sinking or rolling upside-down", says Tina. "The training provides you with the knowledge and confidence to deal with a real emergency situation. It would be useful to anyone TW who flies a lot."

The course includes ditching procedures and techniques, sea survival and hypothermia and using survival equipment that would be part of a downed aircraft rescue. In the hands-on part of the course, participants enter a pool fully clothed and practice donning and swimming in lifejackets, and entering a life raft.

"The final test was using the underwater egress trainer, a simulated aircraft multi-crew cockpit in which participants are turned upside down while strapped inside with a seat belt", says Tina. "The idea is to remain calm, identify the exit, unfasten the seat belt and exit. By the end of the day we were feeling comfortable in the simulator."

Special thanks to Tina Couillard for sharing her story.