HUMAN FACTORS NEWS

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THEME — AWARENESS

Human Factors
Training Solutions

Welcome

This month sees the rollout of the HFTS Instructor program. This 12 module series has been produced to assist flying schools meet the human factors regulatory requirements for Part 141 / 142 operations.

The program provides instructors with an understanding of how and why errors may occur during training, the risks these errors represent, and what can be done to manage these risks.

Existing clients can add their instructors to this course. If you would like to preview the training, please contact HFTS.

What Does This Button Do?

On the 12th October this year a LAME was working on a Belgian Air Force F-16 when he accidentally activated the aircraft's Vulcan M61A-1 cannon. The cannon was loaded and some rounds hit another F-16, causing it to explode. The $26,000,000 aircraft was totally destroyed.

This incident highlights the importance of remaining situationally aware, whether on the ramp, in the hangar, or in the sky.

There are many tips from researchers, psychologists, gurus and the bloke on the bus on how to improve your concentration. Among them are:

Pause occasionally, take a deep breath, exhale slowly and count "one". Repeat until you get to 10.

Use headphones or earplugs to block out distractions.

Regularly do a short session of stretching and exercise.

Get enough sleep (plan for it).

Grab some dark chocolate, a banana, walnuts, or a coffee.

Before commencing a task, take a minute to calm yourself and visualise what you are about to do.

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Increased Workload Causes Error

A pilot made a booking to hire an aircraft from Bankstown Airport for a return flight to Wollongong. After finalising his flight plan, the pilot was advised that the booked aircraft was unserviceable and the booking was changed to an alternate aircraft which was due to return shortly. When this aircraft landed, it was refuelled to full.

The pilot conducted his pre-flight inspection and elected to start the flight with a few circuits at Bankstown Airport before departing for Wollongong. While conducting the circuits, this aircraft also became unserviceable and the pilot returned the aircraft to the flight school.

The school then offered the pilot a third aircraft. The pilot decided to conduct a local training area flight due to the time delays associated with the aircraft changes. He conducted a pre-flight inspection at which time he believed the aircraft had full fuel on board.

The flight was uneventful until approaching the waypoint for the return to Bankstown, when the pilot noticed the engine speed was fluctuating. He elected to track via Camden to avoid overflying built-up areas. The engine fluctuations became worse so the pilot performed the engine failure immediate checks.

Soon after, at an altitude of about 700 feet, there was a total loss of engine power. The pilot identified a field out to his left, made a MAYDAY call to Bankstown air traffic control, and briefed his passenger to secure himself for the landing.

There was moderate turbulence, which resulted in fluctuating airspeed and intermittent stall warning activations during the approach. Considering the conditions, low altitude and the location of the fuel tank selector, the pilot felt that attempting to change fuel tanks would have diverted his attention from flying the aircraft at a critical time. Therefore, he focused his attention on not stalling the aircraft while executing the forced landing.

After the aircraft touched down, the pilot concentrated on keeping it straight over the rough ground until it ran through a fence at the end of the field and stopped when the right wing struck a tree.

The pilot received minor injuries and the passenger was uninjured. The aircraft was substantially damaged.

It is likely that the pilot believed the fuel quantity on board was full at the start of the 30-40 minute flight due to his inspection of other aircraft earlier in the day. However, the incident aircraft only had about 35 minutes of fuel available in the left tank and about 78 minutes in the right tank when it took off. The flight was conducted on the left tank.

Two pertinent human factors elements in this incident were:

Increased workload caused by changing aircraft leading to incorrect understanding of fuel status; and

The excellent decision by the pilot to concentrate on flying the aircraft in a time critical situation.

Know Your Systems

A Gulfstream G150 captain was killed in January 2018 when an explosive depressurisation blasted open the aircraft's door as he attempted to enter the jet at Kittila, Finland.

The aircraft had been parked outside the previous evening, and its outflow valve was left closed in order to prevent ingestion of blowing snow. The captain did not inform the first officer of the valve's closure.

When the crew – comprising the captain, first officer and cabin assistant – returned to the jet the following day the captain entered the cockpit and started the auxiliary power unit, generating electricity and bleed air for heating. The temperature at the time was minus 22°C. The first officer was outside brushing snow from the aircraft and, shortly afterwards, was joined by the captain. When he exited the aircraft, the captain closed the door, leaving the cabin assistant inside.

The assistant started feeling a sensation of pressure in her ears and chest, and sought to attract the pilots' attention by knocking on the window. When the captain attempted to open the airstair-type door, it suddenly exploded outwards, inflicting fatal injuries and knocking the first officer to the ground.

It is thought that the captain, when starting the APU, pressed the 'ditch' button with the intention of opening the outflow valve. However, the Finnish Safety Investigation Authority found that deselecting 'ditch' would not have changed the outflow valve position because automatic pressurisation had been selected at the time. Had the pressurisation system been in manual mode, the outflow valve would have opened.

This incident emphasizes the importance of understanding ALL of the systems in your aircraft. Perceiving cues is vital to remaining situationally aware, but this only works if you fully understand what those cues are telling you.

Minor Error, Major Consequence

Around two hours after taking off from Los Angeles in May last year, the crew of a Qantas Airbus A380 bound for Melbourne, heard a loud bang and felt vibrations through the aircraft. The first officer noticed that the N1 level of engine four was much lower than the other three.

As the crew worked through procedures responding to ECAM messages, they received a message indicating a fire in engine four. In response, they selected the master off switch for the engine and discharged fire retardant into it before diverting back to Los Angeles.

The aircraft landed safely at Los Angeles, and subsequently taxied to the gate where all 484 passengers and 24 crew disembarked without injury.

Minor damage to the aircraft right flap and flap fairing was observed during an engineering inspection. This was attributed to debris exiting the rear of the engine, but there was no visible indication of fire.

The Australian Transport Safety Bureau found that the number four engine failed after corrosion led to fatigue cracking in the low-pressure turbine stage two blades, which separated and caused damage through the engine.

The corrosion was caused by chemical residues from the engine's last service in July 2015. Rolls-Royce has subsequently changed its engine cleaning procedures to remove residual cleaning chemicals.

The lesson here is think outside the square when undertaking maintenance work; consider every possible consequence before embarking on a course of action.