THE ENEMY WITHIN

Capt. Nigel H.W. Ironside LCAG (retd.)

A proposal on additional cockpit door controls

Presented to the

UK FLIGHT SAFETY COMMITTEE

Proposals presented by an **ex Board member of the UKFSC**, in the hope that by using the forum of experts that the Committee represents, these and other proposals alike will find due exposure and be part of the larger discussion picture so that a further accident as perpetrated by the pilot of German Wings in March 2015 can be made unlikely.

I. Summary

This short paper is presented to the UKFSC for purposes of instigating discussion within the Flight Safety community in the interests of prevention and further occurrence. It is hoped that if the contents find agreement with the UKFSC then possibly such ideas that are expressed here might find their way via the UKFSC to other prominent safety forums and committees such as the ESA.

After the deliberate pilot initiated destruction of an Airbus 320 in March 2015 into the French Alps with the loss of 150 lives, it was felt that the full safety implications of the cockpit door locking procedures needed revisiting. This is a submission with arguments and suggestions from an ex Safety manager/pilot.

II. Author's Provenance

Captain Nigel Ironside was the Flight Safety pilot and Safety Manager of Lufthansa Cargo from 1998 – 2003, during which time he became a member of the Board of the UKFSC representing the Lufthansa Group of Airlines and initiated the Cargo Working Group within the UKFSC.

He flew for 47 years, 10 of which in the UK military, amassing over 24,000 hours in 58 different types of aircraft including helicopters. He held ATPLs from ECAC (German LBA), UK, FAA, Bermuda, Saudi

and Oman aviation authorities. He was a FAA Check Airman and Check Pilot/Instructor with Lufthansa. He was from 1999 to 2003 the Safety Manager for Lufthansa Cargo (LCAG) during which time he sat on the Board of the UKFSC, starting the Cargo Working group. In his last 25 years of his flying career he flew for Lufthansa Cargo the DC.8 -73F; B747-200F and finishing his last 5 years on the MD-11F. He retired in 2012.

III. Background

The cockpit door before 9/11.

Cockpit doors were mostly fitted as a smoke barrier with large louvers for the crew evacuation, (should there be smoke sourced from within the cockpit) but on some aircraft (freighters) doors were not fitted at all and were not deemed necessary. i.e. B 747 freighters where the upper deck was used as primarily for crew transport with occasional passengers; in Cargolux and LCAG doors were never fitted in certain aircraft and the armoured door and associated cockpit door panel never. This is still the case with the new build MD-11Fs operated by LCAG today. Despite calls by Fedex for the armoured door to be fitted to all freighters; that call was defended successfully resulting in most if not all European freighters remaining with the standard door.

FEDEX incident

Cause: 1994 Apr – Fedex – DC.10-30. A dead-heading crew member who had falsified his credentials and with pilot training problems attacked the cockpit crew (3) with a claw hammer, with a plan to crash the aircraft into the Fedex HQ building, but the operating crew despite suffering severe head injuries managed to subdue him and land the aircraft.

Pilot suicides

There have been incidences of pilots deliberating crashing the aircraft even **prior** to the armoured cockpit door being introduced after 9/11 in 2001.

PRIOR:

- 1982 – Japan Airlines DC-8, Tokyo Bay. Captain institutionalized
- 1994 – Air Morocco Regional jet
- 1997 – Silk Air B 737
- 1999 – Egyptair B767 – Captain shutdown both engines in flight.

However coupled with a spate of deadly hijacks and finally being introduced after the attacks of 9/11,

there have been proven incidences where the armoured cockpit door has been used as a weapon:

AFTER 9/11:

- December 2013 – LAM (Mozambique) ERJ -190 - Botswana
- February 2014 – Ethiopian Airlines 702* B 767-3BGER - Geneva
- March 2015 – German Wings 9525 – France

* Ethiopian Airlines 702 – Hijacked by the 38 year old co-pilot who locked out the Captain and circled overhead Geneva airport negotiating his asylum. He was persuaded by the captain to surrender, landing with 10 minutes of fuel remaining resulting in an engine flaming out. He was arrested, tried and sentenced to over 19 years in jail. This was quickly blown over in the press probably as no deaths resulted in this pilot's actions (passengers and crew totalled 202). *Nevertheless he used the cockpit door as a tool to take over the aircraft and carry out his misdeed.*

IV. Discussion – "The Enemy Within"

The prime (and possibly only) thinking behind the armoured cockpit door's inception was from the perceived threat from *outside* the cockpit.

It was never even considered that an **"Enemy from within"** the cockpit could exist, despite past history. Perhaps its remoteness was not deemed a "reasonable risk".

Such has been the public clamour after the German Wings incident , most probably due to the shock induced by the "nationality" of its pilot that such a scenario just could not happen in Europe, is the outcry that much louder, that reaction and further investigation is almost certain. It is equally relevant that the aircraft crashed on dry land which allowed the CVR and FDR to be retrieved and supplying the necessary empirical evidence. With Silk Air and Egyptair accidents both aircraft crashed at sea thus denying the investigating teams the truth.

The "knee jerk" immediate measure of ensuring "**two in the cockpit**" is surely to appease the public, but is not viable in the medium term. Hasty "safety" measures due to public pressure are always ill-advised. Cabin crew are not cockpit trained and would not recognise what a pilot was doing and despite knowing the "danger switch" would most likely be unable to prevent some sort of upset – however remote a repeat might be. Even an inadvertent „lockout" as was recently reported (March 2015) by a Dutch pilot for Emirates adds weight to this call. Added to which the inter-collegial mistrust that this new measure would

introduce is not sustainable.

However it is clear that further thought and counter measures are needed, even *physical* counter measures should a pilot be caught, even when personally in the cockpit by a sudden, unexpected and deliberate upset manoeuvre initiated by the “other” colleague. There are cockpits shared by multi-racial nationalities operating all over the world, such is the nature of the industry that such a scenario should not be deemed unlikely.

It is clear that no instant and easy answers are available and the scope of likely scenarios, however obscure, must be considered likely for the purposes of thorough investigation. These will take into consideration:

- Mental stress as a pilot career factor.
- Psychological factors and evidence
- Data (medical and personal) protection issues
- Prolonged sick leave incidences
- Training and standards problems
- Contractual inequality and discrimination. “The disgruntled employee.”

And so forth....

However this is outside the scope of this short paper that is merely to address the fairly quick and easy soft fix of equipment already in place on all present day airline aircraft.

V. Present Status Quo – (A320)

Cockpit Door Switch – description (from A320 Cockpit Door Panel manual)

UNLOCK
Unlocks door when raised above the detent and held in this position. Door must be pushed to open. UNLOCK is an override and reset selection of any previous action

NORM
When NORM is selected; it allows the door to be locked when closed. It also allows the door to be opened after an emergency access code entry and 30 second delay in case of pilot incapacitation.

LOCK
Momentarily placing the cockpit door switch to LOCK illuminates the red cockpit access panel light, rejects keypad entry request, inhibits aural alerts, and prevents further access code entry for 20 minutes. The cockpit door switch returns to NORM when released, but remains in locked mode for 20 minutes or until UNLOCK is selected.

There is no cockpit indication when LOCK is selected; therefore, if the door is closed and the cockpit is unattended during a locked period, the door cannot be opened until the timer expires or power is removed from the airplane.

VI. Parameters for change

- Assuming the minimum of two pilots in the cockpit. With Heavy (long range) three – man crews, the third member is normally having crew rest, and so the status quo of two is always present.
- Present procedures and equipment continue – *perhaps looking again at the time of "lock-out" intervals*.
- Prime redundancy is not compromised
- "Normality" is preserved without additional psychological pressures being introduced.
- Ease of implementation with minimum extra funding required.
- Assumption that the "**Intruder from outside"** issue has been safely addressed with the present door switch coupled with an undisturbed colleague. However even these procedures should not be ignored totally. Perhaps the present 30 second time lapse should be thought through once more.
- Assumption therefore that "**UNLOCK**" and "**NORMAL**" switch positions are satisfactory.
- Using existing technology

VII. Additional safeguards – "LOCK" position

It is proposed that the following extra parameters be introduced and wired into the Cockpit Door panel directly into the "**LOCK"** position.

For activation of the "**LOCK**" switch position, the following additional parameters must ***ALL BE FULFILLED*** and/or ***SATISFIED***:

	Pilot Action required	Modification required
Parameter 1	**Transponder Code inserted. Hijack or Emergency code entered**	**Wiring of the transponder into the LOCK switch of Cockpit Door panel. Code specific.**
Parameter 2	**Both Capt and FO seats must be occupied simultaneously.**	**Weight sensors in each seat (from Automobile industry) also wired into the LOCK sw. position.**
Parameter 3	**Battery Bus and 1 AC Bus powered**	**Wired into the Cockpit Door panel – All Engine Flame Out and Rescue mode**

Parameters – expanded description

1. ATC Transponder codes allow for external alerting – these would purposefully communicate externally from the aircraft alerting ATC of a problem, allowing them to take whatever action deemed necessary. i.e.
    I. Alerting or deviating other traffic away from the problem area.
    II. Alerting the military for assistance
    III. Prevents secrecy or "hides the event" until too late. Tracking then possible.
    IV. Inter aircraft communication
    V. Radar tracking.
2. Using weight seat sensors/alerts as used in the automobile industry for driver and passenger seat belt compliance, ensuring that the "**LOCK**" position would *not* work when *only one* pilot seat was

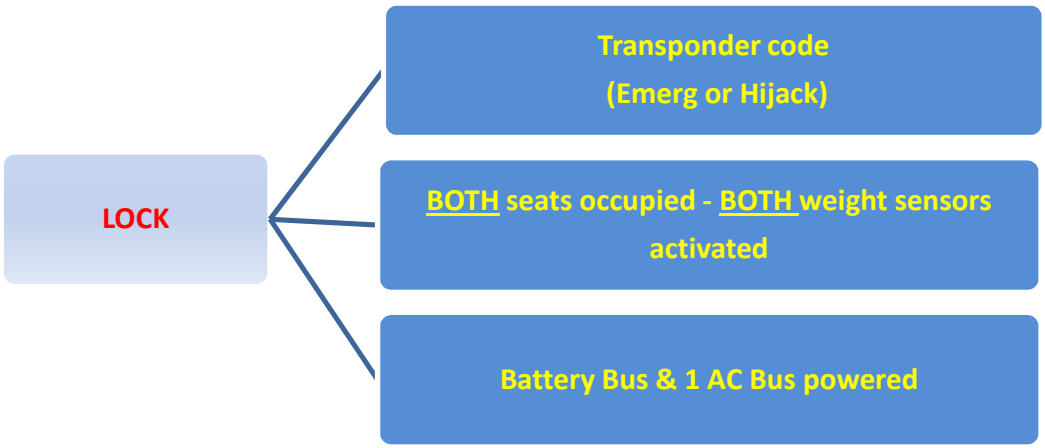
occupied**. BOTH** seats to be occupied for activation/satisfy parameter.

3. Electrical Power sources :
    a. MID AIR All Engine Flame out – Protection against such action as occurred with Egyptair. Hopefully with time remaining to affect a relight and RAT deployment, should cockpit access be affected.
    b. RESCUE Mode – ensures electronic disconnect in the event of total power loss, so that Rescue teams are able to extract the crew in the event of a crash and incapacitation, if the door was in "**LOCK"** position at the time of impact. Prevents rescue teams being prevented from entering the cockpit on the ground. Background - It is thought the observing pilot (3rd seat) in Turkish Airlines B 737-800 in April 2009 – Schiphol, survived the impact but died several hours after the crash still in the cockpit due to the inability of the fire teams to gain access hampered by the armoured cockpit door.

WHEN AND ONLY WHEN, ALL 3 PARAMETERS/GATES ABOVE ARE FULFILLED CAN THE "LOCK" POSITION FUNCTION.

VIII. Activation Hierarchy

To graphically illustrate § V11, the following table is provided:



IX. Conclusion

I believe it is prudent to allow the enormous data base of knowledge from the retired pilot community a say and added input into modern day safety discussions. It is hoped such ideas presented above are found to be useful in the forthcoming safety discussions in various forums around Europe and the world.

Even professional pilots fly as passengers and even as professionals in the back seats, they would feel relieved if and when this devastating scenario, where everyone is rendered helpless can be eradicated for the most part from the aviation scene. "Passenger pilots" whose expertise when cockpit access would have been possible could have possibly "rescued" the situation in the event that both pilots are physiologically impaired e.g. Food poisoning, kidney stone colic even hypoxia (e.g. Cyprus Airways with a helpless steward in the cockpit) and which all have happened etc*. Perhaps as with Doctors, a notation on each passenger manifest indicating useful professional qualifications is a resource at the moment ignored*.

The introduction of the armoured cockpit door, also due to public pressure, was a case where a "quick" defence mechanism, ill thought through, had a negative effect on flight safety. The aviation community must resist the "quick fix" once more and not compound the errors made previously that now force a revisit to a multi faceted problem. Not all events can be eradicated with a corresponding safety measure. Loop holes will always be found if the will is there.