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Human Factors in extremis

The Rogue Pilot Phenomenon



The Germanwings crash has brought the rogue pilot phenomenon to the front and center of aviation safety attention. Unlike other aircraft accidents which may be resolved by evidence at the accident site, the rogue pilot investigation takes the investigator into non-traditional areas of inquiry. Specifically, it will take the investigator into the personal and often private life of the flight crew. While accident investigators have adeptly addressed the issue of Human Factors via the lens of Crew Resource Management (CRM), Threat and Error Management (TEM) and Human Factors Analysis and Classification (HFACS) for decades, the issue of the intentional crashing of an aircraft by the pilot remains largely a dark corner of ignorance. The purpose of this paper is to focus the light of understanding onto this issue so that we can take a confident step forward in accident investigation.

This is not a review of the Germanwings case. The Germanwings investigation is not complete and the facts are not fully established. It is instructive, however,

to review several of the cases that fall into the rogue pilot/intentional crashing category. Precedents provide context. Also necessary is a clear understanding of the terms that may apply to these types of cases. Finally, this paper will examine the rogue pilot/intentional crashing phenomenon from two complementary perspectives. First, as a crime that takes place within an aviation context; and second, as a human factors/psychological mishap that has profound aviation safety repercussions.

I am not a psychologist. I am however an investigator who dedicated 18 years of my FAA/TSA career to the investigation and mitigation of unlawful acts against civil aviation. Unlawful implies intentional. Unlawful and intentional are two of the elements of the rogue pilot phenomenon. I led the Los Angeles portion of the Egypt Air 990 investigation in cooperation with the FBI and have directed and participated in dozens of intentional acts of unlawful interference against civil aviation, most notably hijackings and bombings of aircraft.

This paper draws primarily upon the work of two authors: John E. Douglas, Special Agent (S/A) (retired) with the FBI Behavioral Analysis Unit - considered the father of criminal profiling - and Dr. Thomas Joiner - a pre-eminent authority on the phenomenon of murder-suicide; a phenomenon which provides many relevant insights into the development of the rogue pilot psychology.

S/A Douglas' work is contained in The Crime Classification Manual (3rd edition) by Douglas, Burgess, Burgess, and Ressler and also in Douglas' biography Mind Hunter. Douglas served as the real-life model for the character of Jack Crawford in the movie.

Dr. Thomas Joiner is a Distinguished Professor of Psychology at Florida State University. He is the author of over 475 publications. Among these his recent book, The Perversion of Virtue, is solely focused on murder-suicide, the fundamental psychological condition underlying the pilot murder-suicide phenomenon. His books, Myths About Suicide and Why People Die By Suicide, also serve to inform this paper.

Dr. Kay Redfield Jamison is a Professor of Psychiatry at Johns Hopkins University and an Honorary Professor of English at the University of St. Andrews in Scotland. Her book Night Falls Fast provides significant statistical context for suicide as a whole. Similarly, The Suicidal Mind by Edwin S. Shneidman provides understandable context for the conditions which lead to suicide.

Definitions

Homicide: The action, by a human being, of killing a human being. (Etymology; a man-slayer) The Oxford English Dictionary.

Murder: The unlawful taking of human life. (Douglas, p. 111) It is first among the commandments; "Thou Shalt Not Kill." It is the most basic crime. The rogue pilot has no right to take the lives of the passengers, therefore this action is, at its most basic level, the crime of murder.

Mass Murder: The unlawful killing of four or more victims by the same offender(s) acting in concert, at one location in a single continuous event that may last minutes, hours, or days (Douglas, p. 16).

Murder-suicide: is the term that Joiner uses in his book The Perversion of Virtue to describe, "a murder followed by a suicide." (Joiner, p. 14) Joiner states emphatically that the intention to commit suicide comes first, and only once suicide is decided upon does the individual seek to justify his own death, by the murderous death of others. He states "Given the contingent nature of suicide and murder in these incidents, and given that both are tied together in perpetrators' minds by a perversion of virtue, it is not a surprise that the time interval between murder(s) and suicide is almost always on the order of minutes or hours." (Joiner, p. 16) Further, Joiner asserts that "Far from Being Impulsive" murder-suicide is premeditated.

Psychosis: The mental disorder of not being able to distinguish reality from unreality. Delusional.

Table 1: Pilot Initiated Crashes

<p>26 September 1976 – 12 fatalities A Russian pilot stole an Antonov 2 airplane and directed the aircraft into a block of flats in Novosibirsk, where his divorced wife lived.</p>
<p>22 August 1979 – 4 fatalities A 23 year old male mechanic, who had just been fired, entered a hangar at Bogotá Airport, Colombia and stole a military HS-748 transport plane. He took off and crashed the plane into a residential area.</p>
<p>9 December 1982 – 24 fatalities, 150 survivors The captain of JAL 350 a DC-8 on a domestic flight from Fukuoka to Tokyo-Haneda, pushed the controls forward on approach causing the aircraft to crash into Tokyo Bay, approximately 1,000 feet short of the runway. The first officer and flight engineer fought for control of the aircraft, but were unsuccessful in preventing the crash.</p>
<p>13 July 1994 – 1 fatality A Russian Air Force engineer stole an aircraft from the Kubinka AFB to commit suicide. The aircraft crashed when there was no more fuel left.</p>
<p>21 August 1994 – 44 fatalities A Royal Air Maroc ATR-42 airplane crashed in the Atlas Mountains shortly after takeoff from Agadir, Morocco. The accident was suggested to have been caused by the captain disconnecting the autopilot and directing the aircraft to the ground deliberately. The Moroccan Pilot's Union challenged these findings.</p>
<p>19 December 1997 – 104 fatalities Silk Air Flight 185, a Boeing 737 en route from Jakarta, Indonesia to Singapore, crashed in Indonesia following a rapid descent from cruising altitude. Indonesian authorities were not able to determine the cause of the accident. It has been suggested by the U.S. NTSB that the captain may have committed suicide by switching off both flight recorders and intentionally putting the Boeing 737 in a dive, possibly when the first officer had left the flight deck. During 1997 the captain experienced multiple work-related difficulties, particularly during the last 6 months. Also at the time of the accident the captain was experiencing significant financial difficulties, which was disputed by the Indonesian investigators.</p>
<p>11 October 1999 – 1 fatality An Air Botswana captain who had been grounded for medical reasons took off in an ATR-42. He made several demands over the radio and finally stated he was going to crash the plane. He caused the plane to crash into two parked ATR-42 aircraft on the platform at Gaborone Airport, Botswana.</p>
<p>31 October 1999 – 217 fatalities Egypt Air Flight 990, a Boeing 767, entered a rapid descent some 30 minutes after departure from New York-JFK Airport. This happened moments after the captain had left the flight deck. During the investigation it was suggested that the accident was caused by a deliberate act by the relief first officer. The NTSB</p>

concluded that the accident was a “result of the relief first officer’s flight control inputs.” The suggestions of a deliberate act were disputed by Egyptian authorities.

29 November 2013 – 33 fatalities

LAM Flight 470 entered a rapid descent while en route between Maputo and Luanda and crashed in Namibia. Preliminary investigation results indicate that the accident was intentional. The captain made control inputs that directed the plane to the ground, shortly after the first officer had left the flight deck.

In addition to the above cited cases, the crash of PSA 1771 should be included. A Los Angeles based employee of Pacific Southwest Airlines (PSA), after having been terminated from his position, used his airline ID to board a flight with a handgun, killed his supervisor who was a passenger, the other pilots, and caused the aircraft to crash with the loss of all souls on board. The case of Fed Ex Flight 705, a DC-10 cargo flight from Memphis, Tennessee to San Jose, California in which a dead-heading flight engineer attempted a murder-suicide but was prevented by aggressive action by the crew, also provides useful insights into the nature of pilot murder-suicide cases.

Pilot Murder-Suicide as a Crime

Pilot murder-suicide fits within the definition of mass murder. The commonalities and characteristics of individuals who commit mass murder can inform our understanding. Douglas states that “Most violent crime careers have a quiet, isolated beginning within the offender’s imagination.” In his time with the FBI’s Behavioral Analysis Unit, S/A Douglas offered the following metaphor to new investigators striving to learn the art and skill of criminal profiling: “If you want to understand the artist, you have to look at the painting.” Following this metaphor, the crime provides insights into the criminal just as the painting does for the artist. These specifics are significant because of the planned and premeditated nature of most of these incidents. The specifics are planned and chosen and reflect intention.

Douglas also stresses the concept of Victimology, in that a complete understanding of the relationship between the killer and the victim can often yield insights into the motive or the reason for the action to have taken place. (Douglas, p. 11) (Douglas, p. 30)

It has been said that the mass murderer will likely have a very active fantasy life. The role of the internet has fed this. For our purpose, a description of technologies impact couldn’t be more important as “The Internet has meant that old concepts of boundaries and borders and limitations are gone... the Internet seems to have freed something that had previously been repressed in the human mind, or the unconscious, or the body itself. Self-imposed restriction or controls were fading, and people did things in cyberspace they might have never done anywhere else.” (Douglas, p. 39) There is also a feeling of privacy with the Internet. One works and searches the

internet as an individual not as a team or social activity. It can be done in private with no one in attendance. One can log in with an assumed name or identity. Working on the internet can create the feeling of absolute privacy but, of course, this is false. Every keystroke is recorded somewhere. The impression of absolute privacy is ultimately false.

Some investigative organizations use a mental model which can be called “The Three Selves” as a way of looking at any individual’s behavior. This model posits that each of us can be seen as having “Three Selves.” The first is the Social Self which is the person that is known to friends, workmates, and other individuals that we routinely come into contact with. The second self is the Personal Self who is only shared with our spouse or confidants. The third self is the Private Self which is shared with no one. It is often within this private self where the fantasy life exists and the seeds of violent crime grow. The collision between this private fantasy life and the other two external lives can be devastating. In 1998 the United States Customs Service broke up an internet child pornography ring. As a result of the disclosure of their involvement four individuals connected with Wonderland committed suicide.

The degree to which mass murderers can keep their murderous fantasy life a secret is most notable. In the year 2000 in Olathe, Kansas, a middle-aged man by the name of John Robinson contacted six women via the Internet, developed a cyber-relationship with them and killed each of them, concealing their bodies in chemical barrels at farm property that he owned. After his arrest, his neighbors “told the media that he was a quiet fellow who kept a statue of the Virgin Mary in his back yard and always put up wonderful holiday decorations.” His wife and children also stated that he was innocent of the killings. (Douglas, p. 43)

The case of Edmund Emil Kemper “The Co-ed Killer,” who was responsible for 10 killings, is another example of the hidden self. After being released from custody for two murders that he committed as a juvenile he was required to make regular visits to state psychiatrists. One appointment took place the day following one of the murders. Kemper, on this occasion, was pronounced as no longer a threat to himself or others. He was only half-way through his murderous career.

In his book, Douglas reiterates the perspective of retired S/A Jim Clement of the FBI’s Behavioral Analysis Unit that an individual’s behavior can be viewed as occurring within a spectrum or continuum of behavior and not always within the same narrow band of behavior. (Douglas, p. 9) The point is that there is a third private self where an individual’s fantasy life can live and grow and that this fantasy life can exist unseen for long periods of time to those around him.

The Psychology of Murder-Suicide

The Perversion of Virtue is Thomas Joiner’s work that is exclusively devoted to murder-suicide. As we have seen

earlier, the Rogue Pilot phenomenon fits the definition of murder-suicide just as it does the definition of mass murder. The central idea of Joiner's work is that cases of murder-suicides begin with the individuals' intention to commit suicide. He states that suicide "is not only primary, but it is also the source of all that follows, especially including the appalling murders; murder occurs because of suicide, as a consequence of suicide having been settled on." (Joiner, p. 9)

Joiner states that the thinking of the individual reflects the feeling "If I am to die it is only virtuous that they do too." (Joiner, p. 9) This is the perversion of virtue that is captured in the title. It is Joiner's belief that an individual reaches the conclusion to kill himself first, and that only after having concluded so moves on to the justification of the suicide by the murder of others. Suicidal ideation and commitment is the preceding stage before moving on to murder suicide. The line of thinking that can lead to suicide is based upon burdensomeness and lack of effectiveness. An individual concludes that "I am just a burden upon those that I care about" and "I really don't belong."

Individuals seek to justify the murder of others as seeing them as virtuous actions. Joiner cites four virtues that he believes are operative in cases of murder-suicide: justice, glory, mercy, and duty. The "Soon I'll be dead. But is it fair that I suffer that end, while those who have deeply wronged me go unpunished and live happily on?" (Joiner, p. 9) This line of thinking is a perversion of the virtue justice. The case of Korean student Seung-Hui Cho at Virginia Tech University is an example of the perversion of justice. Cho viewed his peers as "deceitful charlatans," and "rich kids" who engaged in "debauchery." (Joiner, p. 162) Joiner points out that in the eyes of the individual enacting murder-suicide, his actions are not "cowardly, vengeful, or selfish." They are instead following a compelling path resulting from a perversion of justice.

Copypat behavior can be seen in two of the most famous murder-suicides. In the Columbine High School murder-suicides Eric Harris and Dylan Klebold killed 13 people before losing their lives to the police. In their incident they sought to achieve greater infamy than Timothy McVeigh who killed 168 in the Oklahoma City bombing of the US Federal Building. (Joiner, p. 172) Similarly, Charles Whitman, on the same day that he heard the news that Richard Speck had just killed eight nurses in their Chicago dormitory, visited the Bell Tower of the University of Texas. Later that month he killed 13 people and wounded 31 shooting from that same tower. (Douglas, p. 475) Because of the desire to surpass the grisly killing of other mass murders these murder-suicides can be seen as perversions of the virtue of glory.

Joiner also argues convincingly that because of extreme difficulty in killing one's self, suicides, and murder-suicides are not impulsive or spur of the moment. An individual may work himself up to suicide by self-harm. Each incident of

self-harm building up a tolerance to lethal self-harm.

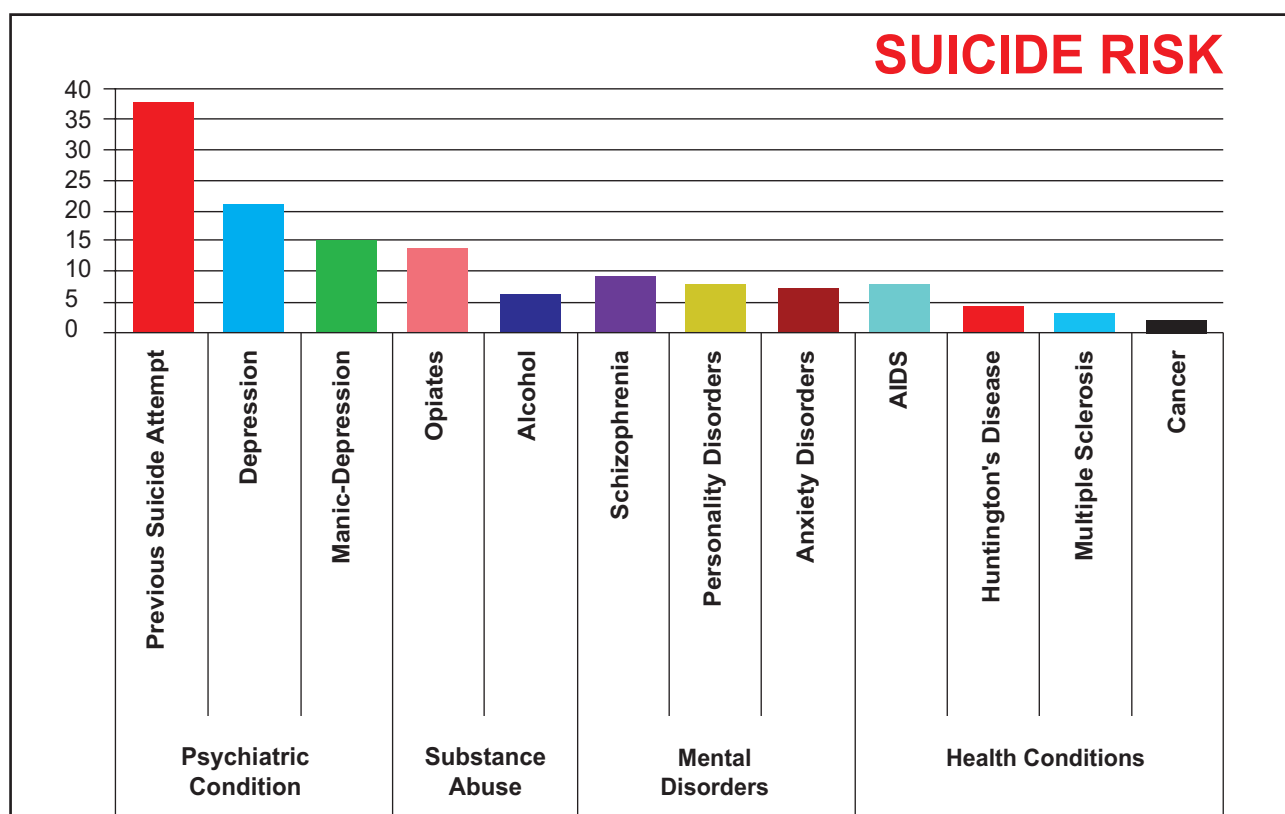
How common is murder-suicide? In 24 samples conducted in the US, the range varied from 0.17 – 0.55 per 100,000 population or a mean value of 0.32 per 100,000. According to the Boeing 2013 Statistical Summary the combined commercial accident rate (2004-2013) was 0.33 per 1,000,000. (Joiner, p. 41) So, while being a rare phenomenon a murder-suicide incident is ten times more frequent than a commercial aircraft accident. To put an even finer point on it, Joiner estimates that there are 1,574 deaths per year due to murder-suicide in the U.S. A ten-year average of commercial aviation fatalities in the US from 2003-2012 was 15.3 per year. That being said, following the Colgan Air accident in February, 2009 there were no US commercial passenger accidents through the remainder of 2009, 2010, 2011 and 2012 (NY Times Feb11,2013). Clearly incidents of murder suicide are hundreds to thousands of times more frequent than commercial aircraft accidents. (Side note: there are approximately 38,500 deaths by suicide annually in the US. Murder-suicides account for 2% of the total. Side note 2: It should be pointed out that over 90% of those who commit murder-suicide are men. (Joiner, pp. 41 - 43)

This brings up a striking perspective on murder-suicide. As with murder-suicide, ninety per-cent of individuals who commit murder per se are men. And while 75% of the victims of murder are also male 76% of the victims of murder-suicide are female.

Two risk factors that increase an individual's likelihood of suicide are living alone, and the death of a partner within two months. Joiner interestingly points out that cultures of honor (like the South and West of the United States) have a higher than average suicide rate.

It is important, however, to point out that the individual committing murder-suicide, according to Joiner, is generally not a psychopath. Psychopathic murderers derive pleasure from the killing. "One of the main features of the psychopathic personality is a callous, unempathetic, and uncaring emotional style. Extreme selfishness is also involved." (Joiner, p. 68)) This is not the murder-suicide mentality which sees the murder(s) in the context of performing a virtuous act.

Since most incidents of murder-suicide have suicide as a precondition, what conditions increase an individual's likelihood of committing suicide? The following chart presents a graphic summary of the results of 250 clinical studies done by Clare Harris and Barraclough in England. It depicts the habituation to self-harm that Joiner says is necessary to emotionally move one's self to lethal self-harm. It also presents depression and manic-depression as the primary preconditions for suicide also complementing Joiner's explanation that suicidal ideation is based upon a feeling of a lack of belonging and a feeling of a lack of effectiveness.



Clare Harris and Barraclough

Joiner points out in *Why People Die by Suicide* that disturbed sleep and nightmares are related to suicide. Insomnia has also been linked to advanced depression and thoughts of suicide. In Chapter Five of *Why People Die by Suicide* Joiner presents genetic and neurobiological explanation for these behaviors. The single most significant neurochemical in the depression-suicide evolution is serotonin. Serotonin is the neurochemical that regulates emotion, sleep and appetite. Further, several studies have shown that suicidal predisposition is transmitted genetically through families and their descendants.

The element of life-insurance fraud is encountered in several murder-suicides including some in aviation. In the Fed Ex Flight 705, the dead-heading crew pilot took out a \$2.5 million dollar life insurance policy prior to the attack. Similarly, the pilot of Silk Air Flight 185 had been experiencing financial difficulties and took out a life insurance policy before the ill-fated flight.

Finally, the absence of a suicide note means virtually nothing in the course of a murder-suicide investigation. "Three-quarters of those who die by suicide do not leave a note." Studies conducted on the subject range from 0% to 40% of suicides that leave notes, the average being about 25%. (Joiner, *Myths About Suicide*, p. 119)

Joiner also points out something that can strike us as contradictory. People can conduct activities that indicate that they are planning for the future and also be planning on dying. (Joiner, *Myths About Suicide*, p. 65) Joiner says this later in when he states "attention and emotion do not

always operate in lockstep." (Joiner, *Myths About Suicide*, p. 128) What does this mean to us as investigators? Simply, it means that just because an individual has paid for a vacation holiday next month, it is not assured that he will not make a fatal decision today.

Investigative Touchstone

First, the primacy of suicidal intention that precedes many if not most murder-suicide acts provides a valuable starting point.

Second, suicides and murder-suicides are premeditated and entail planning over time. They are not impulsive acts.

Third is the role of fantasy and imagination in the evolution of the murder-suicide intention.

Fourth is the role of the internet and all high tech opportunities for the individual to indulge and develop the fantasy/secret life. The subject's computer, phone, and chat room activities are the DFDR's of this kind of investigation.

Fifth, it is important to remember that individuals who develop a secret/fantasy life are adept at keeping them hidden. Neighbors, families and even psychiatrists (in the case of Edmund Emil Kemper) can be fooled.

Finally, pilots by virtue of their profession can live in several places and establish different Selves in different places. This expands the scope of the investigation to destinations frequently visited by the pilot.

Additional notes for context

Not part of the above paper

Silk Air 185

The NTSC investigation into the MI 185 accident was a very extensive, exhaustive and complex investigation to find out what happened, how it happened, and why it happened. It was an extremely difficult investigation due to the degree of destruction of the aircraft resulting in highly fragmented wreckage, the difficulties presented by the accident site and the lack of information from the flight recorders during the final moments of the accident sequence.

- The NTSC accident investigation team members and participating organizations have done the investigation in a thorough manner and to the best of their conscience, knowledge and professional expertise, taking into consideration all available data and information recovered and gathered during the investigation.

- Given the limited data and information from the wreckage and flight recorders, the NTSC is unable to find the reasons for the departure of the aircraft from its cruising level of FL350 and the reasons for the stoppage of the flight recorders.

- The NTSC has to conclude that the technical investigation has yielded no evidence to explain the cause of the accident.

The US NTSB responded to the Indonesian investigation report in a letter dated December 11, 2000. The NTSB states that "when all of the investigative evidence is

considered, it leads to the conclusions that: 1) no airplane-related mechanical malfunctions or failures caused or contributed to the accident, and 2) the accident can be explained by intentional pilot action. Specifically, a) the accident airplane's flight profile is consistent with sustained manual nose-down flight control inputs; b) the evidence suggests that the cockpit voice recorder (CVR) was intentionally disconnected; c) recovery of the airplane was possible but not attempted; and d) it is more likely that the nose-down flight control inputs were made by the captain than by the first officer."

LAM 470

Minutes before the crash the first officer left the cockpit for the lavatory and only the captain remained in the flight deck. The altitude was manually selected three times from 38 000 feet to 592 feet (below ground elevation). The auto throttle was manually re-engaged and throttle level automatically retarded and set to idle. The airspeed was normally selected several times until the end of the recording ... which remained close to the VMO (maximum operating limit speed), reads the preliminary report, adding: "During all these actions there were audibly low and high chimes as well as repeated banging, an indication of calls to enter the cockpit."

Nengola disclosed that the flight operations were normal and the aircraft was cruising at 38 000 feet. The preliminary report concluded: "All actions observed from the recorder requires knowledge of the aircraft's automatic flight systems as the entire descent was performed with the autopilot engaged. This displays a clear intent. The reason for all these actions is unknown and the investigation is still ongoing."