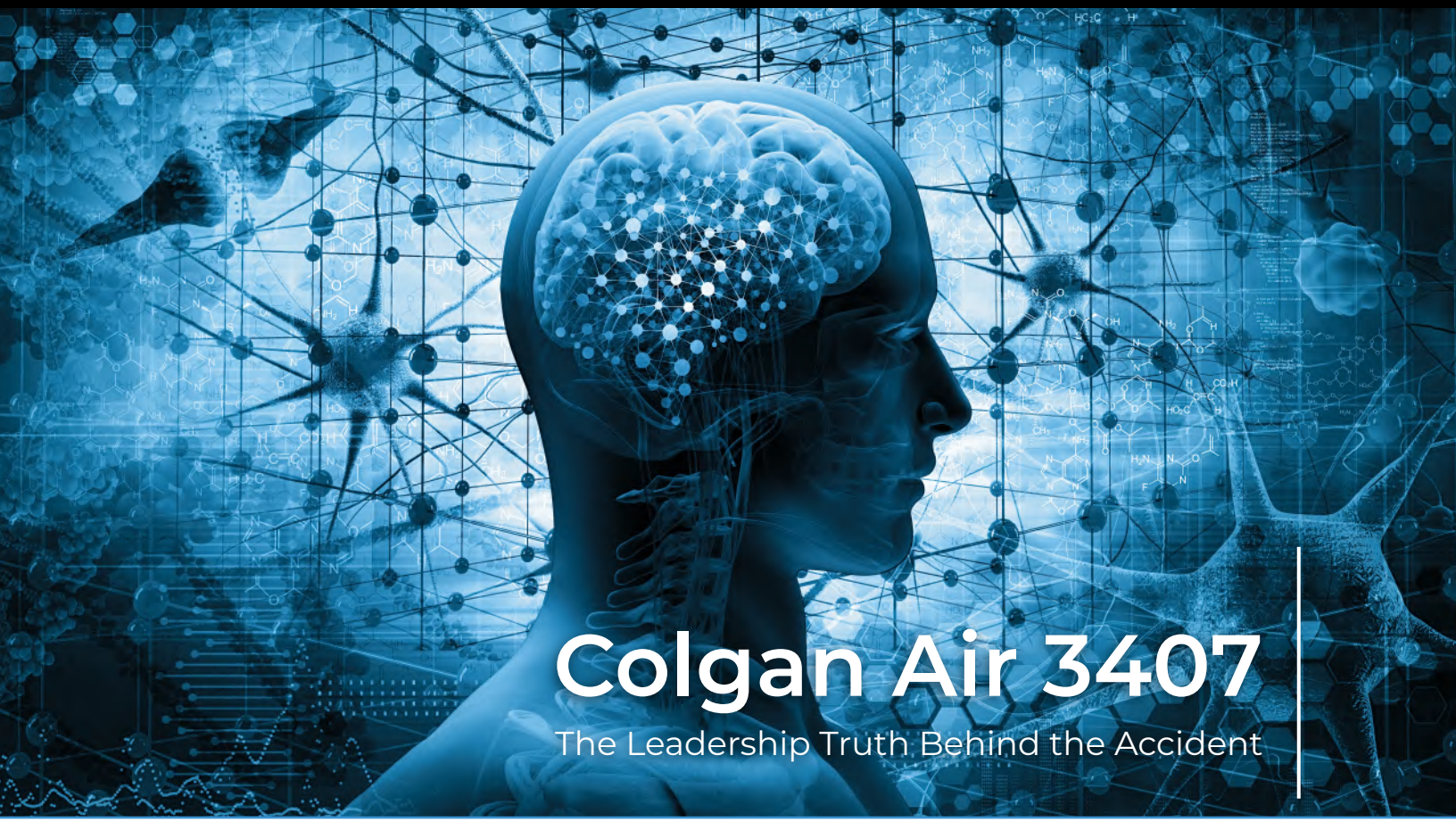

Colgan Air 3407

The Leadership Truth Behind the Accident

Was the lack of Emotional Intelligence (or emotional maturity) a contributing factor?

Dr. Shari L. Frisinger | Sājet Solutions

On February 12, 2009 Colgan Airlines Flight #3407 crashed while on approach to Buffalo Niagara International Airport. All 49 people aboard the aircraft and one person on the ground perished in the mishap. The professional investigators painstakingly combed through every element of evidence that led up to the disaster in an attempt to determine the actual cause(s) that were responsible for this tragedy. No evidence sheds blame on a failure of the aircraft or its components. This led investigators to focus on the crews' competency, training and overall health.

On that fateful day, the crew was scheduled to report to work at 1330. The strong winds at the airport caused the cancellation of several flights. Flight 3407 was initially scheduled to depart, and left the gate, at 1945. The pilots were not given taxi clearance until 2030, and takeoff clearance came at 2118. At 2216 the plane crashed.

There are reports that the male captain had difficulty passing his previous check rides. Other reports determined that the female first officer was congested and had to commute all night to arrive at her duty station on time. Because there was no indication that the aircraft was at fault, the issue of crew resource management (CRM) is worthy of significant review and analysis.

There is not enough evidence to determine how much interaction the Captain and First Officer had prior to the start of the cockpit voice recording. Based on this author's analysis, she makes the assumption that this information would have had not changed the outcome.

Leadership Skills

A leader is a person whose knowledge and acts shape the thoughts and behaviors of others. People take their emotional cues from the leader, and base their own emotional responses on the leader's emotional reaction. The captain of an aircraft is the leader of the flight, having overall responsibility for the safety of the other crew members and the passengers. The author won't debate whether leaders are born are made; however there are two types of learned leadership skills the author used in assessing the captain's leader effectiveness: cognitive skills, which are the foundation of leadership skill requirements, and interpersonal skills, which "relate to interacting with and influencing others" (Mumford et al, 2007, p. 156).

According to Katz (1974), cognitive skills are those speaking skills that one uses to communicate what needs to be done and explains why, the listening abilities which helps one understand the message, and critical thinking skills that help facilitate the asking of appropriate questions. These competencies contribute to one's ability to learn new skills and more easily adapt to a changing environment. Interpersonal skills include any thoughts, actions or words that relate to interacting and influencing others. These skills incorporate attentiveness to others' responses and comprehending the underlying rationale behind the responses. Interpersonal skills also encompass coordinating actions, persuading, and negotiating differences to accomplish mutual objectives. These latter skills have been called 'people skills' or 'people smarts'. A person that has high people skills "is aware of his own attitudes, assumptions and beliefs…sensitive to the needs and motivations of others … can judge the possible reactions to various courses of action …" (Katz, 1974, p. 91).

Leaders need both thinking skills and the ability to relate to others. These are both elements of Emotional Intelligence.

Both cognitive skills and listening skills have a foundation of Emotional Intelligence (EI). EI is the ability to understand one's own emotions, gauge the emotions of the other person and create the best possible outcome for all involved. It is the skill used to effectively deal with people – their motivations, their issues and their shortcomings – which fosters highly successful teams. It is one's 'internal and external situational awareness'. Leaders that have a high level of understanding of their own emotions, and the emotions of others, are able to use that insight to motivate, inspire, challenge and connect with others. The results are greater than the disciplined and detached methods (intimidation, use of power to coerce, domination) used by traditional leaders (authoritarian, autocratic and directive). The authoritarian leadership style can result in the other crew members not comfortable in speaking up when the captain makes an unsafe decision – 'Captainitis'.

High EI has been shown to be the primary forecaster of superior performance. It is the most powerful force behind leadership and personal excellence. Leaders that are adept at dealing with their own emotions and handing the emotions of others have outcomes such as successful negotiations, team excellence or, in the cockpit, working effectively with the other pilot and crew members. EI research has shown that 70% of the difference between average performers and high performers is attributed to emotional competence.

EI encompasses numerous components; due to space limitations, this paper focuses on three top performance traits: Empathy, Self Esteem and Initiative.

Empathy

Empathy is defined as the "intellectual identification with or vicarious experiencing of the feelings, thoughts, or attitudes of another", "identification with and understanding of another's situation, feelings, and motives." Empathy combines an analysis of the situation with the appropriate sympathy for the person. Empathy allows a person to choose appropriate words and actions based on the other person's feelings. An empathetic person is seen as concerned, genuine and compassionate in their ability to see things from the other person's perspective. As people more willingly share their own feelings and beliefs without fear of retribution or ridicule from the leader, more open conversations are generated. According to several researchers, empathy is one of the primary character traits of influential leaders and star performers.

There are only two occasions where the captain casually acknowledged that the first officer was not feeling well: Early in the flight, after what appeared to be a sneeze, he commented "Bless You". She replied "Excuse me, ok." He appeared to have quickly forgotten that she was not at her best as he immediately continued on his conversations about himself ["it's my little deal and it is what I was taught"] referring to how he handled entries in the logbook. The researcher acknowledges that saying a various form of "Bless you" quickly becomes redundant; however, the captain appears unable to put himself in the first officer's position of sneezing and feeling fatigued. An empathetic leader realizes that when a team member is not filling at their best, their cognitive functions may deteriorate.

To illustrate this point, later into the flight she responded to a transmission from Cleveland Control Center.

> Cleveland Control Center: Mesaba thirty forty five contact Cleveland Center one two zero point six.
>
> First officer to Cleveland Control Center: one two zero point six Colgan thirty four zero seven.
>
> Cleveland Control Center: nope Colgan thirty four zero seven you stay here. that was for Mesaba.
>
> First Officer to Captain: I'm not doing very good by * tonight.
>
> Captain: it's alright. (seven seconds later) sorry about that. oh anyway he (Houston
>
> Controller) would say Eeeeeeeeastwood information echo.

This was a continuation of his story that was interrupted. The captain continued on for yet another two and a half minutes, unaware of her lack of responses. About nine minutes later, the following conversation took place:

> Captain: "How's the ears?"
>
> First Officer: "uh they're stuffy"
>
> Captain: "are they poppin?"
>
> First Officer: "yeah"
>
> Captain: "okay that's a good thing."
>
> First Officer: "yeah, I wanta make em pop". "is that ice on our windshield?
>
> Captain: "got it on my side. you don't have yours?" * [sound of whistle]
>
> First Officer: "oh yeah oh it's lots of ice."
>
> Captain: "oh yeah that's the most I've seen— most ice I've seen on the leading edges in a long time. in a while anyway I should say."
>
> First Officer: "oh * [unintelligible word]."

In another instance:

> Cleveland Center controller: "Southwest six fifteen cleared direct to the Buffalo airport."
>
> First Officer: "that us?"
>
> Captain: "nope"
>
> First Officer: "I didn't think so."
>
> Captain: "yeah"
>
> First Officer: "[sound of laughter] I just heard direct Buffalo."

These occurrences demonstrate the first officer's thinking may not have been totally focused on her duties and she may be not hearing or thinking clearly. These further call attention to her condition regarding her inability to perform her flight duties. Basic understanding of CRM and crew performance should have alerted the captain that the first officer was not feeling well that day and her performance was negatively impacted. A leader with greater awareness of the actions of others could have easily recognized that the first officer was not fully engaged in her work duties. Subsequently, her ability to actively participate as a viable crew member could be negatively impacted. Ensuing steps should have been discussions with her to personally assess her performance level and take the necessary actions.

Analysis of the log revealed the captain to monopolize nearly all of the conversations – talking 19 minutes out of 40 (from the first of his stories to the last entry: 40 minutes, 31 seconds.). He focused on his prior experiences, his current situation and his own future. He appeared to be oblivious to the first officer's deteriorating physical condition. Even when she talked specifically about her inexperience in icing conditions, and she reassured herself about feeling more confident with future flights, the captain chose to not respond directly to her concerns. He interspersed his own icing experiences with appropriate current flying commands. The aircraft was below 10,000' and his story-telling was highly inappropriate. He completely disregarded sterile cockpit procedures.

The Captain was impressed with his own abilities, not considering the consequences of the First Officer's sickness symptoms.

The empathy component of EI would have benefited the captain in two primary areas: how the first officer was feeling [the opportunities stated above] and her insecurities about the weather [see below]. It is the captain not realizing that the first officer's physical state directly affected her mental state is a key element contributing to the failure of this crew to interact as a team.

This failure created a dysfunctional platform which ended in disaster.

Self-Confidence

This is defined as "a realistic respect for or favorable impression of oneself"; "self-respect and realistic confidence in one's own judgment, ability, power, etc." When someone has average to high self-confidence, they see themselves as competent, successful and valuable. With this confidence, they are more likely to be honest and open about, and vocalize, what they experience internally. They are able to deflect belittling comments and stay true to their values and beliefs.

Pilots often have large egos and an abundance of self-confidence. This researcher discovered this in her Embry-Riddle Aeronautical University (ERAU) Master's research. An entire chapter in the book The Naked Pilot is devoted to this topic. These character traits also correlate with two of the FAA's defined hazardous attitudes: macho and invulnerability. A captain can have a distorted view of their personal situational awareness – that he/she is superior to the other pilot, whether it is because of seniority, age or type of aircraft experience. The FAA defines macho as "I can do it! Always trying to prove that they are better than everyone else". That same organization defines invulnerability as "It won't happen to me! Feels accidents happen to others, but never to them". The captain demonstrated both of these hazardous attitudes throughout the flight.

One of his seven-minute monologues he interspersed very few flight commands:

> Captain: "I said you know uh uh all this stuff is just happening to me. And it's – you know hell the only thing I Haven't had is is (sic) an air return."
>
> Captain: "I'm going @ my FO cool as #. Man should I get my uh smoke goggles on and everything. Said yeah gimme- gimme the memory items. I'm- I'm over here."
>
> Captain: [relate a story from a previous flight. He said to a flight attendant after he smelled smoke] "hey do you smell any smoke back there? No. why? Should I? well no you shouldn't. I'm glad you don't. thanks for playing the game. And I just cut her off. Good [unintelligible word]". There were sounds of laughter. Shortly after that his story concluded with "after that day we went to the uh steakhouse…and drank a messload of beer …. If you upgrade to the SAAB…".

In was in this monologue that the first officer's only responses were "yeah", "uh-huh", "ooh", laughter and other non-responses. The first officer said 43 words in those seven minutes, and in only one instance did she say more than three words at a time. She was not feeling well [his lack of empathy toward her made him appear to be unmindful about
her ability to be an effective crewmember that night] and she was disengaged from the conversations [lack of personal situational awareness on his part]. It follows that he was feeling insecure about his own flying experience [failing his check ride multiple times] and wanted to prove that he was a capable captain. These comments include: [relative to flying the SAAB]

> Our mind rationalizes to preserve our self-esteem and own our self-value. Our actions directly reflect what our mind is telling us.

> "That a neat airplane to fly. It's not like this … I mean it's taking five steps backwards but you're in the left seat …"
>
> "You know I started this little gig late in life … it's like a second career for me basically because I was able to take that package from Verizon … at this point do I go to a major and not be able to be there for very long …".
>
> "Well that sounds - well I mean I didn't have sixteen hundred hours." "but uh as a matter of fact I got hired with about six hundred and twenty five hours here."

Human nature rationalizes a less-than-ideal situation to minimize damage to a reputation. This maintains ego and prestige associated with a position. The captain justifies staying with Colgan Air in terms of his age, instead of admitting that he may not be able to get on with the major airlines because of his flying record.

Very little is known about the first officer: where she flew, what she flew, etc. She did talk briefly [about three minutes] about her IOE, lack of experience with icing conditions, tentative plans for her future, Alaska Air, and her quality of life. What we do know in these conversations should have alerted the captain that she was not experienced and was not fully present. When this is combined with their current weather conditions, the captain should have been more cognizant of the challenges in continuing the flight.

Much has been publicized about the captain's record and the concerns for his prior flying experiences. While on that fateful approach and during one of the rare icing discussions, he mentioned he got hired with only 625 hours, with 250 hours with a Part 121 multi-engine turbine operator. In the next breath, he barely acknowledged the first officer when she spoke of her lack of icing and her northeast weather experience. He immediately turned it back to his minimal experience with icing, in the SAAB, and him being a "Florida man, barely…. Out of Pensacola."

Two minutes later he stuttered "there wasn't – we – never had to make decisions I wouldn't have been able to make now but I'm more comfortable ..."; meanwhile he was still unaware of what was rapidly developing around him. Less than three minutes later, there was a sound of a thump and the first officer screamed.

Several times he derailed the conversation off the logical course and back to himself:
after a radio transmission from Cleveland Center clearing them to cross BENEE intersection at 11,000', he immediately turned the discussion [monologue, actually] to an air traffic controller in Houston who had "a perfect personality for the being a controller..." That lead to another story about his experiences in other Texas cities he's flown. Based on the captain's pattern during this flight, this four-minute monologue was stopped only because of an altitude alert signal.

Initiative

"Leading action", "readiness and ability in initiating action", "the power or ability to begin or follow through energetically with a plan or task" is how initiative is best explained. It is the leader proactively addressing an issue and presenting a viable solution. Initiative is directly tied to assertiveness and flexibility, two additional components of BarOn's mixed-model of EI. (These are included in the scales of Intrapersonal and Adaptability.)

This researcher discovered several other indications of the captain's lack of initiative and low self-confidence. In each of these instances, the researcher interpreted his words as being unsure of himself and his own piloting abilities:

The following conversation took place at slightly above 12,000':

> First Officer: "oops I think I had two seven six two I think I put half and half. two seven six two yeah. twenty five and then I switched that one. oops."
>
> Captain: " it's just like we're in I don't know just just a light haze or type cloud. I don't know just we can see things out in front of us."
>
> First Officer: "do you want to go down?"
>
> Captain: "huh? ohh. I was thinking about that."

This demonstrates another instance where the first officer's cognitive abilities were not fully engaged. Adding this to the previous first officer's miscommunication errors, the captain's inattentiveness to her grew.

Did the Captain ask questions, or give a command? Depends on your viewpoint ... **two very different consequences can result.**

When talking about TRAVA at approximately 11,000',

> Captain: "oohh let's see I forget. Do I do the do the first one?" [sic]
>
> First Officer: "I did the first one. It doesn't matter you could do either one, there's no hold in there ...."
>
> Who was directing whom? This should have been a command from the captain, not questions to the first officer. He should be taking control of the aircraft, not looking for agreement or direction from her.

Taking initiative correlates to situational awareness - effectively directing personal energy to achieve goals, taking action or resolving problems when necessary. The captain severely lacked in this area relating to the icing conditions despite the numerous mentions of the deteriorating weather.

• At one point, the first officer mentioned to the captain "Alrighty and for the rest of that weather uh three miles. It's snowing with some mist". His response was "alright", which could have been a response to her "alrighty", or an acknowledgement of the weather. It was three minutes later that he said to her "It's just like we're in I don't know just just a light haze or type cloud. I don't know just we can see things out in front of us" [sic].

• About twelve minutes later, the first officer announced to the passengers "…weather in Buffalo is uh pretty foggy. Uh snowing a little bit there it's not too terribly cold …." The captain chose not to address the unchanged weather conditions.

• Two minutes later

First Officer: "is that ice on our windshield?"

Captain: "got it on my side.. you don't have yours?", then he whistled.

First Officer: "oh yea oh it's lots of ice."

Captain: "that's the most I've seen – most ice I've seen on the leading edges in a long time…"

The first officer then talked briefly about her lack of experience with ice. The captain's response was to laugh. She was, once again, giving him direct prompts telling him of her inexperience and he never indicated any concern that she may not offer any help to him if conditions worsen.

• Three minutes before the crash,

First Officer: "I've never seen icing conditions. I've never deiced. I've never seen any— I've never experienced any of that. I don't want to have to experience that and make those kinds of calls. you know I'dve freaked out. I'dve have like seen this much ice and thought oh my gosh we were going to crash… but I'm glad to have seen oh— you know now I'm so much more comfortable with it all."

Captain: "yeah uh I I spent the first three months in uh Charleston West Virginia and uh flew—…"

The captain did not appear to have control over his situational awareness, especially after the first officer declared she was not familiar with flying in icing conditions. He didn't offer suggestions that would be helpful in concentrating on flying in the unfamiliar weather conditions, even after she mentioned "I've never seen icing conditions. I've never deiced…." Both times he turned the conversation back around to his flying experiences. Her comments literally fell upon deaf ears. Initiative dictates pursuing the topic by asking probing questions about the weather situation. This was a prime opportunity to give her real time advice and alert her to various scenarios, etc. Any of these actions would have demonstrated reasonable leadership and initiative. His failures to take decisive action literally lead them into a death trap scenario.

The captain ignored the fact that his first officer had very little experience in icing conditions and avoided directly addressing the dangerous weather conditions. He failed to recognize her shortcomings in this area and implied that he was unaware of the severity of the situation. This demonstrated a severe deficiency in personal situational awareness. He was presented with one of the best leadership and teachable opportunities: to work with her to become proficient flying in the adverse conditions they encountered. The captain's effective response might have been "Neither one of us has flown a lot in these northeast conditions – let's walk through the appropriate steps to take…". This would have focused them on piloting the aircraft, reviewing the procedures, verifying information, checking the gauges and clearing up any uncertainties and away from his irrelevant stories. Not taking the opportunity to mentor her, or taking the appropriate action himself, demonstrated a strong lack of initiative. It is this researcher's belief that his complacency in these areas was a leading cause of this accident.

Additional Factors

Tragically, this was a perfect storm: deteriorating weather, lack of both pilots' experience flying in icing, flight delays, previous long days and lack of sleep, and most of all the low level of the captain's emotional intelligence. If the captain had more concern for the first officer's physical and mental health and consequential actions, would that have saved lives? Possibly not in itself – he could have instigated a dialogue about her declining condition. Through these discussions, it probably would have become obvious that she was not performing at 100% and that he needed to be more alert to her actions and inactions. It is his responsibility, as a Captain and as a leader, to insure the safety of the crew and passengers. He did not take the steps necessary to fulfill this responsibility.

If the captain had more self-confidence, would the outcome have been different? Possibly … he may have felt more comfortable with his first officer having 774 hours in the aircraft vs. his 110 hours. He may not have felt compelled to chatter endlessly about his vast flying experiences, seemingly to impress her, or boast about how he single-handedly resolved situations. Low self-confidence causes us to over-act in many ways … he chose (consciously or unconsciously) to focus the conversations on himself and away from his shortcomings. Had the captain taken control of the conversations and been fully engaged in commanding the aircraft in those conditions would the results have been different? Possibly.

> No empathy, no situational awareness, no forward-looking communications, no self esteem … a perfect storm is brewing.

While CRM may not be the foremost solution to avoiding communication errors in the cockpit, it has proven to enhance both the communications skills and the emotional intelligence of the participants. Inspecting the transcript, we can look at breaking the error chain from several perspectives:

1. Both pilots were unaware of their own strengths and weaknesses; they had low degrees of internal and external situational awareness which is part of low emotional intelligence. High internal situational awareness is linked to greater performance in assessing several hundred managers across a dozen organizations. Admitting what you are not proficient at is no crime – it is to pretend in a situation as serious as this.

2. Would the captain having a higher level of emotional intelligence affected the outcome?
   Two primary areas of EI cover awareness of self and awareness of others. Whether deliberate or not, he chose not to reach out to her, to not realize the depth of her affected performance. This was a main factor in the lack of the two pilots working together as a team, and the outcome is the proof.

3. Had the first officer chosen to call off sick (and paid for her hotel room herself), another first officer would have been substituted. Depending on the personality and self-awareness of the substitute first officer, the accident may not have happened. This one link, the replacing the first officer, could have had a tremendous impact on the flight.

NTSB Findings

The NTSB has released their findings of the exact cause of the crash. This researcher believes that there is room for a more reasonable explanation for what actually went wrong. The technical facts show in their final few moments of the flight the captain failed to demonstrate any situational awareness at all. The airspeed bled down rapidly and he failed to react to it. He further aggravated the problem by not adding any power. As the aircraft began to exhibit controllability issues, he again failed to lower the nose to regain airspeed and actually fought the shaker stick by pulling back on it. He continued to fight the aircraft; this researcher believed the captain's mind reverted to a primitive "fight or flight" reaction. His focus became narrower and he disregarded his professional training. Logical, rational thought did not exist in his mind at this time.

Conclusion

Although EI is depicted in several different models, emotional self-awareness and the awareness of others' emotional state are strong components in the top validated models. The captain's lack of situational awareness is consistent with his words and his behaviors. Whether he was aware of his inattention to his first officer's condition and chose to ignore it is unknown. It is also unknown if he was aware of how long he talked, especially under the 10,000' area. What this implies is that the captain's level of emotional intelligence was lower than what it should have been, given his position as a leader.

Human factors is a broad topic encompassing communication, perception, ego, decision making, fatigue and stress. Accidents such as Tenerife in 1977 and Washington National in 1982 have occurred because messages were misunderstood or erroneous assumptions were made. The original 1979 CRM workshop presented research results that identified "three main human factor causes of air crashes: failures of interpersonal communication, decision making, and leadership" (Mearns et al., 2001, p. 382). The researcher presented evidence to show that the captain was deficient in interpersonal communication and leadership.

CRM had an added benefit: it actually worked to increase the emotional intelligence of the crew. Effective CRM forced participants to become more aware of their behaviors and how others are affected by those perceived behaviors. Simply put - the benefits of good communications in the cockpit cannot be refuted.

Human Factors, an integral part of CRM, combines both internal and external situational awareness. It encompasses communication, perception, ego, fatigue and stress.

Human factors, when coupled with the fascinating and burgeoning topic of EI, the outcomes of certain scenarios were highly predictable. People with high EI seemed to do very well in business and are successful because of their leadership skills. What about those who score low in EI? What kind of people are they and why are they not successful? How these crew members would have scored on the emotional intelligence scale and whether that could be a factor in the crash will remain unknown. There is little doubt in this researcher's mind that the captain's lack of initiative and self-confidence [which are key elements to effective leadership], and his deficiencies in situational awareness demonstrated that he was a victim of his own low emotional intelligence.

Emotional intelligence is a quickly developing discipline and one that is certainly worthy of additional study. Imagine how many tragedies like this accident could have been avoided if we better understood EI and how it affects the performance of critical functions like piloting an aircraft.

NOTE: This analysis, based solely on the NTSB CVR transcript, is from a human behavior/ emotional intelligence perspective and is not meant to assign blame to any specific entity or company. Much like when CRM was first introduced, this illustrates another inter-personal dimension that, external to aviation, has been shown to improve performance. All CVR quotes have been taken from the official NTSB transcript as they were transcribed and reported. The researcher assumes no liability for inaccuracies on the original NTSB CVR transcript.

About the Researcher

dr.shari@sajetsolutions.com

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