Mangalore Air Disaster:Learning for Organizational Leadership

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Risky work environment is inherently configured to be fallible. The author highlights a few selective socio-technical realities of Mangalore air disaster that enabled the occurrence of the event. The study attempts to recover the learning from Mangalore air disaster. Subsequently, it repositions the learning derived from Mangalore air disaster in organizational business context. It contributes to the knowledge as to how fallible systems could be created resilient and reliable.

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Introduction

Modeling human behavior in crisis is not new and rather it has a long tradition. A few of such examples are Mann Gulch Fire accident (Weick, 1993), Tenerife Air Disaster, Bhopal's Union Carbide Gas Leak (Shrivastava, 1987; Weick, 2010), The Esso Gas Plant Explosion (Hopkins, 2000), Mount Everest Accident (Kayes, 2004), Walkerton Water Contamination Crisis (Mullen, Vladi& Mills, 2006), Columbia Shuttle Disaster (Dunbar &Garud, 2005), Trading Room (Beunza & Stark, 2005), United Flight 232 Catastrophe (McKinney, Barker, Davis, & Smith, 2008) to name a few. Discourse over crisis management provides important perspectives that could be incorporated into our personal behavior and organizational infrastructure for informed management of risk (Birkland, 2009). This study attempts to recover the learning that could have relevance in the management of crisis-ridden organizations.

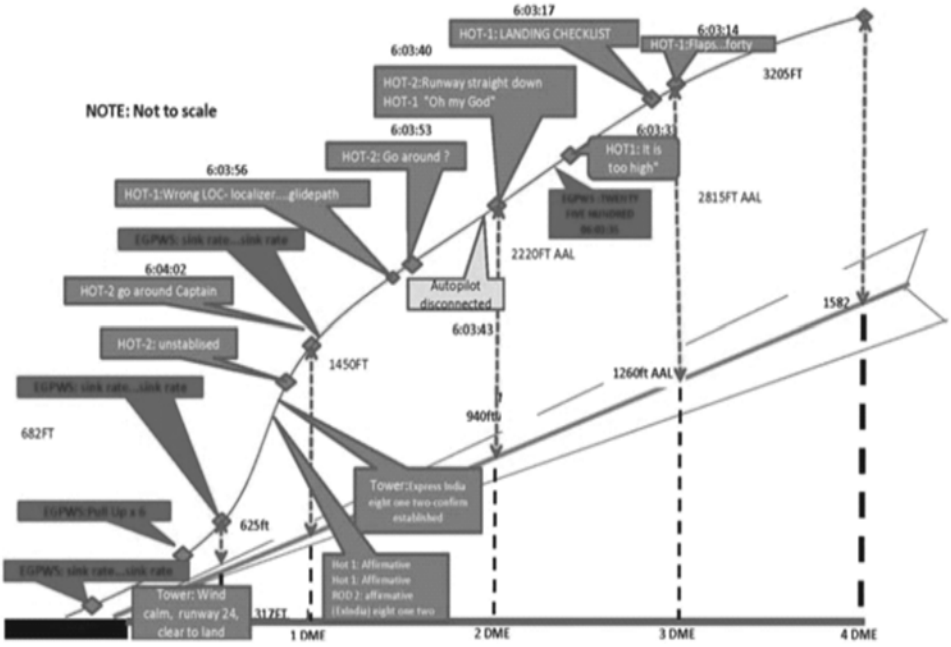
Brief Description

On May 22, 2010, at about 6 a.m., Air India Express flight IX-812, Boeing 737-800 VT- AXV, while landing at

Mangalore Airport, overran the airport runway and crashed into a gorge, killing 2 pilots, 4 cabin crew, and 152 passengers. Only 8 passengers survived with injuries. Both the Captain and the First Officer were highly experienced in their respective crew positions. Captain Glusica from Serbia, 55 years old pilot, had logged 10215 hours as Pilot in Command position out of which 2844 hours on 737-800 and had made a total of 16 landings in the past at the Mangalore airport. He earlier worked in Yugoslavia, Malta, Canada and Australian carriers. After returning from his vacation, this was his first flight duty flying back from Dubai to Mangalore. The First Officer, Harbinder Singh Ahluwalia, 40 years old, who was stationed in Mangalore, had logged 3620 hours, with Boeing 737-800 3319 hours and had operated as a copilot on 66 flights at the Mangalore airport.

While attempting to land, the aircraft overshot the runway including the strip of 60 meters, and continued into Runway End Safety Area (90 meters) and the subsequently right wing impacted the localizer antenna structure (85 meters) and fell into a gorge after hitting the boundary fence. The aircraft was totally destroyed due to the impact and post-crash fire.

Fig.1 Approach Profile Including Salient Recordings from CVR



It could be argued that the aircraft was flying high while attempting to land. It was almost twice the altitude as com-

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pared to standard decent procedure. The First Officer called for 'unstabilized' approach and requested for 'go-around'. The electronic signaling system displayed in the cockpit provided regular warnings for danger associated with the current landing approach. Ignoring the First Officer's assessment and recommendations for go-round, complemented by electronic warnings in the cockpit, the Captain attempted to land. Just before the touchdown, cockpit voice recorder indicated that the First Officer made a call "go round Captain – we don't have runway". After touch-down, the Captain opted for Thrust Reverser, but within 6 seconds, initiated an attempted take-off, in contravention of Standard Operating Procedures, set by the Boeing Commercial Airplane Company,USA.

The cockpit voice recorder, normally capable of recording for last 2 hours 5 minutes indicated that there was no conversation between the two pilots for first 1 hour and forty minutes and the Captain was asleep with intermittent sound of snoring, deep breathing and by the end, sound of clearing throat and coughing could be heard. The First Officer attended all the radio calls, and courtesy calls from the Airhostess. Thus, almost negligible interactions between the two pilots, the apparent discomforting health situation of the Captain, incomplete briefing, improper plan for decent of the aircraft, ignoring the assessment of co-pilot and cockpit electronic signal system, non-availability of radar support at the airport co-created an ecology, where perhaps accident is the only possible outcome.

Cockpit Authority Gradient & Power Dynamics

We look into power dynamics at the cockpit, and its role in procreating the Mangalore air disaster. We examine cockpit authority gradient and explored its link with relevant literature from aviation, psychology and medicine. We review the general tendency among cockpit crew when interaction is interrupted by hierarchy. We also ask questions of ourselves – does national culture have any role in this case? It could be argued that while flying the aircraft, almost no interaction occurred between the Captain and the First Officer that potentially made a significant contribution to the Mangalore air disaster. The cockpit authority gradient was sharp. We also observe that the flying crew performed status consistent dialogical performance.

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6:03:14: First Officer: 'Flap forty'.
6:03:17: First Officer: 'Landing checklist'
6:03:40: First Officer: 'Runway straight down'
6:03:41: The Captain: 'Oh my God'
6:03:53: First Officer: 'Go around?' (Auto pilot disengaged by the Captain)
6:03:56: First Officer: 'Wrong LOC – localizer – glide path'
6:04:02: First Officer: 'Go round Captain'.
6:04:05: First Officer: 'Unstabilized'
6:04:20: Tower : 'Wind calm, runway 24, clear to land'
6:04:55: First Officer: 'Go round captain. We don't have runway left'.

(In the next few seconds, aircraft crash-landed into a gorge, killing pilots, other crews, passengers, including 4 infants, leaving only 8 adults who survived somehow).

Oscillation between hierarchical organizational structures and deference to expertise in emergencies are the two important cornerstones in this case. The First Officer accepted the sanctioned and legitimized expertise of the Captain during emergency; at the same time, the Captain failed to accept the situational interpretation provided by the First Officer. The situation accelerated into a danger zone quite swiftly – it appears that the distance between safe, safety and emergency all coexisted within a few seconds away.

Flying an aircraft involves a high degree of interactive complexity. Observation from medicine-in-action literature shows that day to day operations could not be captured into rules and theoretical principles (Lock, Young&Cambrosio, 2000; Franklin &Roberts, 2006). Fluidity into the unfolding situation makes it difficult for codification. It could be argued that knowledge distilled elsewhere is not waiting for its application in practice, but is constantly produced for its immediate application (Smith-Jentsch, Baker, Salas & Cannon- Bowers, 2001). For example, research indicates that pilot engaged in flying responsibility at the time of the incidents commits more errors that trigger an incident, but non-flying pilot is less likely to lose situational awareness. It was also found that the Captains, legally responsible for the flights lose situation awareness more often and commits relatively more tactical errors when they are at the controls than otherwise. It implies that active engagement with the flight control system provides less opportunity for perspective development that might be available to the person not actively engaged with the flight maneuvering. Flying aircraft with inferior perspective over the situation is dangerous while linking with differential power dynamics available in the cockpit. Mangalore air disaster is no exception from this. Non-flying pilot, impaired by his cockpit hierarchy, had right situational perspective and warned the Captain on several occasions. Mangalore having a table top airport, action by the junior pilot is legally not sanctioned. That reduces further opportunity for non-flying pilot for intervention. Thus the junior pilot, the last frontier of human defense available in the cockpit, failed to interact with the system to reproduce adequate actions for prevention of air disasters. An NTSB study titled A Review of Flight Crew-Involved Major Accidents of US Air Carriers, 1978 through 1990 did a statistical analysis of characteristics of operating environments, errors committed and the contexts in which the errors occurred in 37 accidents. One of the crucial findings was that in more than 87 per cent of the cases, the Captain was flying the aircraft and the crew was paired together for the first time on the day of the accident in 73 per cent of the cases. This study also found that in many accidents, the First Officer did not challenge the Captain with adequate force to recover from the crisis situation.Similarly, deriving out of flight simulators, another

NASA research found that the First Officers tend to couch challenges to the Captain more indirect and less emphatically than a Captain's challenge to the First Officer (Fisher &Orasanu,2000).

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Burns & Stalker (1961) demonstrated that hierarchy is efficient during stable and predictable conditions; however it may turn out to be inefficient under dynamic and changing conditions. Using commando group operation during World War II, Bolman& Deal (1986) elucidated the importance of participation and involvement during the planning process, though commanding officer rightfully improvises it according to the nature of the challenge. Therefore, they argued that an organizational solution must have nourishment from different perspectives and frameworks. Using high reliability organization theory, Weick (1987) argued for 'requisite variety' in human configurations for management of a complex system. Less variety of human presence in the organizational system makes accurate diagnosis impossible. Requisite variety will enable successful perspective generations. Presence and provision for creative synthesis among individuals having diverse variety will allow drawing a complete picture and makes diagnosis relatively easier, thus delivery of quick remedies of the situation becomes feasible.

Power is being considered as a capacity to influence other people (French & Raven, 1959; Keltner et al., 2003). Does cockpit hierarchy inherit inbuilt vulnerability for an accident which may unfold at any time? Cockpit hierarchy provides unequal power, right and asymmetric control over its available resources. Unequal power signifies differential power system in operation of cockpit signals, priority of interpretation of cockpit signals and preferential rights of executing decision using self-interpreted data as valid. The term right signifies that hierarchy attributes differential rights for certain functions. For example, as per the current Air Traffic Rules prevailing in India, only full-fledged Captain is allowed to land an aircraft in a table top airport such as Mangalore airport. Deployment of differential power and preferential rights generates legitimacy over the usage of asymmetric control over its available cockpit resources. Using social psychology framework of reference, power provides an opportunity to display lower social attentiveness – paying less attention to other's concerns (Galinsky, Magee, Inesi & Gruenfeld, 2006) whereas an individual having lower denominated power in organizational hierarchy and social control systematically considers and accommodates others' contribution while making sense out of a shifting scenario (Keltner et al, 2003). An individual located in a powerful position is vulnerable to interpret environmental cue into more positive bias without any valid ground – it makes them an 'optimistic assertive doer'. Fast, Gruenfeld, Sivanathan&Galinksy (2009) reported that an individual, experiencing activated

sense of power; even dares to believe that the fate of a random event, such as tossing a coin, could be influenced. The said research further reported that the sense of control mediates the relationship between power and action as well as power and optimism. Thus, power derived sense of control makes an individual more optimistic and thus positive evaluation provides them confidence to engage in a relatively more assertive behavior. History witnessed unimaginable accomplishment by the individuals, having a sense of power. "But the relationship between power and illusionary control might also contribute to an escalation of commitment, leading themselves and others down a disastrous path of entrapment" (Galinsky, Rus&Lammers, 2010:27).

Stigmatized Organizational Practices& Imposition of Technologies of Control

The question we address here is: why the Captain did not opt for 'go around' and went ahead with the landing decision, in spite of having all unfriendly situation. It is found that the culture of Air India Express Airline with reference to 'go around' procedure appears to be a stigmatized process.A number of organizational practices, designed to ensure safety of aircraft passenger were in fact used for administrative scrutiny. 'Go around' is one such process in the Air India Express airline. 'Go around' signifies aborting current landing approach by an aircraft pilot due to a number of technical reasons (such as passenger safety, un-stabilized approach etc. as in the given case) and attempt for subsequent landing. Commercial compulsion made 'go around' a costly affair for Airline companies, especially when gasoline price is going higher. The pilot also required to follow a dedicated procedure called Operational Incident Report, signifying multiple organizational surveillances. The aviation controlling authority in India - Directorate General of Civil Aviation (DGCA)- also wanted to have specific intelligence for the reason for such 'go around', whereas the management of particular airlines wanted to have control on cost implication of 'go around'. A particular pilot found opting for 'go around' for a particular occasion becomes a candidate for counseling, a stigmatized process for Air India Express Airline's employees – it was stigmatized in its communication, execution, its impact on pilot's career and its social image. Communication practice followed by the Air India Express Airline enhanced the stigma experience. The airline company utilized publicly displayed duty roster to communicate with the pilot concerned regarding counseling, instead of keeping it a private communication. Against pilot's duty schedule, Air India Express Airline management mentions counseling which is an embarrassing experience to the pilot before another competent colleague. The report also indicated that 'go around' often generated stress on the Captain. In one reported case, usage of public radio telephony by Air Traffic Controller for inquiring about the credential of pilot ('pilot's particular') and the reason to 'go around' puts pilots in an embarrassing situation. In one such particular incident, even media person-

nel found the matter as juicy for its newsworthiness and reported it in the news channel. 'Go around' is designed to be a safety measure for passenger aircraft, but surrounding practice of 'go around' is stigmatized by its stakeholders. Due to its stigmatized dealing with 'go around' practice, pilots often refrained from using it.

Decisions are always made in the presence of an incomplete range of data. Asymmetric data periphery may construe different meanings, according to the preparation of the mind. Cognitive agenda of the mind facilitates selective viewing while confronting an ambiguous situation. Pilots are successfully trained to recognize early-warning signs so that small mistakes are diagnosed and dealt with to avert any accidents. The First Officer was the sole witness in the cockpit data and last frontier of defense for the passengers' safety. Reliance on sole skills and authoritative response from the Captain escalated a simple landing into a crisis of gigantic proportion. The question is as to why the Captain did not pay any attention to the reading and view of the First Officer. The Captain perhaps was quite confident of landing the plane in spite of a challenging situation. The Captain did not pay attention to flight control system data as well as the First Officer's observation. Sherif (1935) demonstrated that people look to the opinions of others for information, while confronting ambiguous situation. In an experimental setup, Sherif asked participants in a dark room to estimate the distance a small light moved. Due to the auto-kinetic effect, most of the participants reported to have noticed the movement of light, even though it was kept static. Initially, the estimation of the distance of movement of light varied among the participants; however, subsequently, after repeated trials where participants heard each other's estimation; gradually, they were seen converging on similar estimation. In another recent study, Abrams et al (1990) reported to have found similar results; however, reported further that conformity was lower among participants, where participants earlier distinguished themselves from out-group confederates. Thus, while confronting ambiguous situations, the individual considers others viewpoints. Perhaps, individual level of confidence to execute immaculate landing prevented the Captain to allocate any attention to multiple warnings and suggestion.

Cockpit to Organizational Reality

The accident is a sad episode, but provides a unique opportunity for learning – we salvage some learning that could be deployed for improvement in organizational life. We highlight only a few significant cases.

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Technologies of Control: Many companies adopted technologies for surveillance to control employee behavior

and offer punitive action for deviant employee behavior. This policy requiresa serious reevaluation. As we see in our current case, fear for punitive experience regarding 'go-around decision' is also attached to the safety of the passengers. Renewal of job contracts, its associated worries for punitive counseling and social undermining among colleagues by public announcements, forced the Captain to choose immediate landing. Introspection in organizational system and processes may reveal the existence of such covert processes. Before launching any organizational processes, critical variables associated with such processes require a thorough evaluation. Go-around invites punitive counseling and associated public humiliation. The Captain chose to land in spite of its un-stabilized approach. Passenger's safety should not be compromised because of economic consideration as a go-round requires additional gasoline. We selectively quote one example to elucidate our arguments. For example, Netflix, the video streaming and rental company, emphasized the nine core values among its employees: judgment, communication, impact, curiosity, innovation, courage, passion, honesty and selflessness. The company's stated belief system aimed at "to increase employee freedom as we grow, rather than limit it, to continue to attract and nourish innovative people, so we have a better chance of sustaining success". This philosophical standpoint provides two sets of simplistic rules for its employees: a) rules that prevent irrevocable disaster and b) rules that prevent moral, ethical and legal problems. Consistent with this frame, Netflix does not have vacation policy and does no tracking of time (Reeves et al, 2012).

Could subordinate, who are submissive in nature but well-informed with ground realities, be ignored for procedural convenience?

Assertiveness: Scanning any organizational landscape may provide insight as to how disagreement across hierarchies, groups and employees are dealt with. Treatment given to the assertive subordinates could work as a sample test to provide clues for future enactment. The despotic leadership system may be operational in certain pockets of the organization. It is important to look into the organizational system, whether submissive subordinates are encouraged, and preferred to (Salas, Bowers & Edens, 2001). Could subordinate, who are submissive in nature but well-informed with ground realities, be ignored for procedural convenience? While the First Officer warned about the aircraft condition in relation to the approaching runway, it could be argued that he could have been more assertive. However, the Captain's continuous allocation of effort, attention and available cockpit resources for attempted landing the aircraft, demonstrated commitment to his imprudent decision. This continuous commitment of cockpit resources must have deterred the First Officer to take contradictory action to nullify the endeavor of the Captain. Mangalore airport is a hill top airport; hence prevailing regulation empowers only fully qualified Captain to land at

the airport. Junior position in the cockpit democracy structured the higher limit of First officer's action. Assertiveness training is useful for making healthy workforce, with psychologically strong and determined individual and positive outlook about self (Ruben & Ruben, 1989). Self- maintenance is almost an individual act in the organization. Organized supports from the management help the individual to recognize manipulation. Assertiveness prevents individuals from being recluse, the experience of suffering in silence and powerlessness.

Lack of assertiveness is not only an individual loss; it could rope in the organizational fate too. Failing to accommodate non-assertive employees' perspectives is considered to be problematic (Salas et al, 2001). Speaking out should be construed as 'civic virtue' that each member should be encouraged to practice. Though apparently assertiveness may be interpreted as resentful and negative, it contributes significantly by providing timely feedback, thus prevents an organization from committing costly mistakes (Graham & Dyne, 2006).

Dialogue Process: There was no conversation between the Captain and the First Officer for about one hour and forty minutes during the flight. The interaction between the Captain and the First Officer could hardly qualify to call it as conversation. Crew Resource Management (CRM) often recommends producing safe aircraft flying in close interaction with crew resource available in the cockpit. However the case indicates that the Captain continually ignored warnings from the First Officer regarding the cut sides of what is standard approaches. Unequal power structure assured in organizational architecture often carries the full potential of similar incidence. Hierarchically organized system allocates unequal power to system participants – thus individuals with higher position are often known for poor perspective takers. Social psychologists suggest that power often closes minds, leading to myopic perspectives and thus the solution is devoid of multiple nourishments from diverse stakeholders. Social psychology enlightens that individual in a leadership position is often tempted not to include subordinates' perspectives into the final composition of the solution. Hence, we found the importance of dialogue culture in the organization.

Family Business: Family ownership type of organizational architecture inherits its full potential for production of unequal hierarchy as seen in the cockpit. Impact of unequal but a sharp transient gradient of authority and continuation bias could be seen in unique family business context. Family ownership facilitates the concentration of control and allows for greater discretion in corporate governance. Family sets the vision of the company and financial targets, selects the board members, design their board configuration and a legacy to continue. Family business provides an intense and personal sense of ownership - thus, often tempted to meddle in management and in the boardroom. Family feuds also complicate the daily management and even better talent will shy away from the family run business organization. Top management in a family business has often become vulnerable

to be the victim of close confidante of family ownership and allows the advancement of family interests over other stakeholders. Therefore, corporate governance acquires new meaning in the family business. Many family business houses become the victim of their own success. Past success, political patronage and connection, legacy wealth and reputation, sibling rivalry, envy and family myths give birth to narcissism among its family leadership team. Narcissistic individuals often seek constant attention and excitement and engage in impulsive behavior where only subjugated and sycophant subordinate survives. Over centralization of decisions, information often reduces the speed and ownership of the decision among its subordinates. It also leads to a suspicious organization where neurotic vigilance, suspicion and distrust create widespread surveillance networks in the organization. The extreme biased authority gradient may possibly lead the organization to less optimal performance (de Vries et al, 2007). Narcissistic leadership is capable of launching a system of surveillance, undemocratic system with its prejudicial treatment equivalent to cockpit episode in Mangalore air disaster. Thus, the family business architecture appears to be vulnerable as it may ignore views from senior executives of the companies.

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Organization with Contractual Configuration: The Captain had a contractual job arrangement with the current organization, subject to renewal on completion of satisfactory job performance. However, weak performance (indicated by go-round incidence, relevant case of counseling etc.) reduces the possibility of renewal. Job insecurity is often associated with contractual job. Job insecurity has severe consequences for an employee's overall life situation (Dekker &Schaufeli, 1995) and includes physical health complaints, mental distress and higher degree of stress. Using experimental, historical, and field studies, researchers are successful to model stress induced behavior. Individuals under stress respond to: a) focus on the short term, neglecting broader consideration, b) rely on stereotypes, c) regress to old and deep rooted behavioral patterns, d) narrow and focus their attention span on scrutinizing central issues, neglecting peripheral ones, and e) becomes easily irritable (Klein, 2001). Organization, while driven by cost compression, secures employees through contractual relationship. Compassionate workplace cultures could work as a cushion. Without an additional humanistic approach to the contractual configuration of employee management inherits significant business risks. Failing to adhere to organizational performance norms and anxiety for non-renewal of contract poses significant risks for its immediate stakeholders. Human resources professionals need to have human face for diverse organizational blueprints they design.

Conclusion

Research findings emphasized the fact that ecology of performance plays a

crucial role especially, when elements interact with each other and procreates completely new problems, which are not imagined by the designer of the system. We also found the traces of human fear of public humiliation and rising uncertainty thereof, significantly affected pilot's behavior. Human resource professionals need to pay adequate attention to the development of effective organizational routines, based upon fairness and justice.

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