The Tenerife Airport Disaster: Miscommunication in the Face of Tragedy

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ENGL 123: Really Cool Essay

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Abstract

The tragic crash of KLM Flight 4805 and Pan Am Flight 1736 on March 27, 1977, is remembered as the worst and deadliest aircraft accident in recent history (Dreifus, 1978). According to Weick (1990), KLM Flight 4805 crashed into Pan Am Flight 1736 on the runway as the KLM flight attempted to take off (p. 573). Due to poor communication and low-visibility weather, each plane's crews were unaware of the other's location. The crash killed 583 people in total and injured many others. This paper explores the possibility that this devastating crash could have been avoided had several essential safety procedures taken place before takeoff. This paper analyzes the preceding events and final details of the crash, compares this crash to the metaphor of leadership in our world's current economic state, ponders the impediments the pilots experienced, and explores lessons learned from the incident. This case features many seemingly insignificant hiccups leading up to the collision, from radio miscommunications to time delays. Research in this essay suggests that both aircraft captains neglected to pay attention to detail, with crew members on both sides overlooking key safety measures leading up and potentially causing the Tenerife airport disaster.

Keywords: Tenerife Airport Disaster, KLM Flight 4805, Pan Am Flight 1736, Tenerife Crash.

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The Tenerife Airport Disaster: Miscommunication in the Face of Tragedy

On March 27, 1977, two passenger airplanes—KLM 4805 and Pan Am 1736—crashed into each other at Tenerife's Los Rodeos airport in the Canary Islands, killing 583 people (Weick, 1990). As a tragedy ultimately caused by a chain of neglected safety measures, there's a silver lining because the accident led to the development of a more standardized phraseology in radio communications between aircraft, and cockpit procedures were reviewed and revised (Baron, 2011). The Tenerife Airport Disaster has had a lasting impact on how air traffic controllers communicate with aircraft crews, specifically in the terms they use and when they are allowed to use them. For instance, in these communications, the word “takeoff” is only spoken once the specific aircraft in question has been given clearance for takeoff (*Radio Telephony Manual*). This small but impactful change is only one example of the lasting positive effects of this crash.

Within the cockpit of commercial aircraft following this disaster, the decision-making processes associated with piloting the plane has become more of a team effort. In contrast, before the crash, these processes almost entirely fell on the pilot's shoulders (*Radio Telephony Manual*). The crew's hierarchy was relaxed enough to ensure that the stress and responsibility did not come down to one crewmember. Younger, less experienced pilots are now encouraged to speak up to their more experienced counterparts if they feel that something aboard is amiss, which people previously viewed as inappropriate. These changes may seem minor or insignificant, but they have greatly benefitted aircraft communication between crew members and air traffic controllers. However, there is still a lot to learn from the Tenerife Airport Disaster and the seemingly minute circumstances that caused it to take place.

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The Crash

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On March 22, 1977, Royal Dutch Airlines jet KLM 4805 collided with Pan Am 1736 on the Tenerife airport runway, killing 583 people in what is now known as the worst aviation disaster in modern history. No one aboard KLM Flight 4805 survived, and only 61 people survived aboard the Pan Am aircraft. Both aircraft were Boeing 747s, making them extremely difficult to maneuver quickly as the two planes impacted. Just before the crash, each plane had waited on the runway of Los Rodeos Airport, anticipating delayed takeoffs due to excess aircraft attempting to land. The foggy weather provided little to no visibility on the runway, compounded upon existing challenges that led to the collision.

The KLM flight pilot was the chief flight instructor for KLM, and he was a very talented and experienced commercial pilot. The Pan Am flight pilot had logged 21,043 hours of flight time over his entire career and was also viewed as one of the best commercial pilots working for Pan Am. Despite the vast experience and knowledge of both pilots, the incident that occurred shows the importance of every crew member participating in safety protocols without fail.

Preceding Events

Both flights were redirected to Tenerife because their original destination, Las Palmas airport, was temporarily closed due to a terrorist attack and bomb explosion (Weick, 1990, p. 572). The KLM flight landed first, with the Pan Am flight landing around 45 minutes later. The Tenerife airport is not as large as Las Palmas; therefore, taxi-space was limited. Thus, the Pan Am flight had to park behind the KLM flight and could not leave until the KLM aircraft took off first (Weick, 1990, p. 572). This simple delay caused a lot of unexpected stress on both aircraft crews and the two air traffic controllers working that day, who suddenly had to deal with several redirected planes with inadequate space to accommodate them.

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When the Las Palmas airport finally reopened, the Pan Am aircraft crew was ready to leave, but the KLM flight had to wait for a small number of passengers who had deboarded the plane. After a short period, both aircraft received instructions to move toward the runway—KLM first, then Pan Am—but confusing instructions from the air traffic controllers led to the KLM pilot accelerating for takeoff without realizing that Pan Am still awaited launch in its path at the end of the runway. By the time the KLM pilot spotted the Pan Am aircraft through the thick fog, he was too close to stop or change course in time to avoid hitting it. The two planes collided, leaving very few survivors and many questions about how something this disastrous could have happened between two experienced pilots and crews. The following section will examine eight impediments to the decision-making process of those directly involved in the crash.

Impediments

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There were eight impediments to the decision making of those directly involved with the crash.

1. **The Diversion of Aircraft to Los Rodeos Airport.** Due to the terrorist attack at Gran Canaria International Airport, incoming flights were redirected to the much smaller airport of Los Rodeos. The Pan Am crew had requested to circle in a holding pattern but were refused by the air traffic controllers (Tenerife Airport Disaster, 2017). Los Rodeos was a small regional airport, ill-equipped to handle both the number and size of the aircraft redirected there. Los Rodeos only had one runway and one taxiway that ran parallel to one another. All the aircraft that diverted to Los Rodeos were so large that they took up all of the taxiways. Instead, the aircraft were directed to line up for takeoff on the runway, which wasn't typical.

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2. **Waiting.** When the Gran Canaria airport reopened, the Pan Am flight was ready to leave but was forced to remain on the KLM flight. There was not enough room for the Pan Am to maneuver around, and it had to wait on both the refueling of the KLM flight and the reboarding of its passengers (MacArthur, 1995, p.171). This caused the Pan Am flight to wait over two hours to depart, even though they were prepared to leave as soon as Gran Canaria reopened. The Pan Am crew had been on duty for eleven hours already, so they understandably had strong reactions to waiting on the KLM flight (Weick, 1990, p. 575).

3. **Difficult Taxiway Conditions**. Air traffic control requested the KLM flight to taxi down the entire runway and then made a 180° turn to get into the take-off position (Official Report, 1978, p. 73). The Pan Am flight was supposed to take the third exit then use the runway parallel to the taxiway. However, the taxiway signs were either confusing or missing; thus, the Pan Am crew accidentally chose the wrong exit (Tenerife Airport Disaster, 2017).

4. **Weather Conditions.** Los Rodeos is over 2,000 feet above sea level and, as such, has weather patterns that do not exist at many other airports (Roitsch et al., 1977, p.8; Weick, 1990, p. 575). High-density clouds are often at ground level at Los Rodeos, causing varying visibilities, and it was in one of these high-density clouds that the accident occurred. According to Roitsch et al., once the Pan Am aircraft turned onto the runway, their visibility was only around 300 feet. The KLM flight was in better visibility but faced clouds coming toward them as they made their way down the runway (Roitsch et al., 1977, p. 8).

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5. **Miscommunications.** The KLM captain moved forward despite the first officer not having received clearance. The instructions they received were not precise or explicit, with the air traffic controller merely saying, “Okay,” when the KLM first officer stated, “We are now at take-off” (ASN Report, 1978). The Pan Am crew did not take this to mean the aircraft was ready to take off, but that they were in take-off position, completely unaware that the other craft was also in place (Weick, 1990, p. 573). Also, air traffic control referred to the Pan Am flight once as “Papa Alpha 1736” instead of its usual call sign, “Clipper 1736,” causing further confusion for the KLM crew (Roitsch et al., 1977, app. 1, p. 7). Finally, the air traffic controllers' primary language was Spanish, while the KLM crew's primary language was Dutch, and for the Pan Am crew, English (Roitsch et al., 1977, p. 9). The series of miscommunications and misunderstandings no doubt contributed to the accident.

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6. **Radio Problems.** Additionally, a simultaneous radio call from the Pan Am flight crew caused a radio heterodyne, i.e., mixing two radio signals, resulting in a 3-second loud, shrill noise in the KLM cockpit. This interference caused the KLM crew to miss the next instructions from air traffic control, which would have prevented them from beginning takeoff in the first place, therefore avoiding the crash (Smith, 2002).

7. **Stress at Tenerife.** Several factors increased the stress at Tenerife, especially for the KLM flight. Many crew members bumped up close to their maximum allotted shift hours allowed in flight for their designated shifts. Crew members working beyond allotted hours meant violating strict Dutch laws, which could have led to fines and even imprisonment—not even the captain had the power to intervene on such violations (Weick, 1990, p. 574). If they left Las Palmas by 7 PM, they might have been able to

make it back to Amsterdam in time, meaning the Dutch crew was anxious to leave Los Rodeos as soon as possible (Weick, 1990, p. 575).

8. **The KLM Captain**. While a capable pilot and revered instructor, the Dutch captain had not flown on regular routes for around twelve weeks before the crash. Because the captain, Van Zanten, was such a respected pilot with seniority, neither the first officer nor the flight engineer protested when the captain proceeded with take-off protocols without receiving specific clearance from the tower (MacArthur, 1995). Had they spoken up or demanded clarification, the resulting crash would likely not have occurred.

What Could Have Been Done: Action Steps

1. The commands from air traffic control were not precise enough for both flight crews to understand what they should be doing or what the other planes were doing. Both the KLM and Pan Am captains should have clarified instructions and confirmed the other aircraft's location. When messages from the tower were unclear due to radio interference, they should have asked for the instructions to be repeated instead of assuming they understood. All involved should have maintained precise, standardized terminology in all communications with one another (Roitsch et al., 1977, p. 27).

    a. In modern organizations, communication is the foundation of a healthy organizational culture (Eisenberg, Trethewey, LeGreco, Goodall, Jr., 2017, p. 36). Current leaders can learn from this failure by ensuring their instructions to followers are clear and easily understood and speaking up when they do not understand instructions given to them. Miscommunication and misunderstandings can be extremely detrimental to families, teams, and organizations.

2. The captains of both aircraft should have waited until the weather cleared to attempt taking off, as the visibility at the time of the collision was only around 200–300 feet. Commercial aircraft should not try to taxi at any airport where the visibility is less than 500 feet (Roitsch et al., 1977, p. 26). Although it could have caused problems with the Dutch crew and the laws restricting their hours, their lives were more important.

    a. Sometimes leaders must make tough decisions under pressure and duress. The decision to wait until the fog lifted and the weather cleared may not have been a popular one, and it would have increased the delay for both the KLM and Pan Am flights. Still, it was unwise to begin taxiing without good visibility or clear instructions from air traffic control. Leaders may find themselves in situations where it seems safe to go ahead with a new idea or plan, but the leader decides to be cautious instead of going full throttle.

Resulting Improvements and Appropriate Lessons

There are several lessons to be learned regarding effective technology management. For example, there is not yet a device available to combat a heterodyne or the phenomenon that occurs when two radios transmit simultaneously, effectively canceling each other out (Smith, 2002). At highly congested airports, this can be a problem, and the only solution is for pilots or air traffic controllers to ask the transmitter to repeat their information. A heterodyne partly caused the communications issue between the KLM and Pan Am aircraft, and, interestingly, a more reliable solution has not yet surfaced. Many questions stand after such a horrific event. How often are problems arising in the eyes of organizational leaders without a second thought? Did the KLM flight crew even understand that they had missed a message over the radio in the

case of missed transmissions? Are leaders fully equipped and trained on the technological systems they use?

Additionally, the Spanish government installed a ground radar at Los Rodeos following the accident. Had ground radar been present at the time of the crash, the control tower would have known the position of all the aircraft at Los Rodeos and would have known that the Pan Am flight took the wrong exit, causing KLM to point directly at them. At the very least, they could have seen that both planes were on the same taxiway (Tenerife Information Center, 2018). Perhaps the small airport didn't see a need for ground radar at that time, but it could have made a massive difference in the incident. In organizations, leaders in charge of technology governance should make sure to be aware of the organization's needs and departments and fill in gaps where possible (Andriole, 2014, p. xv).

Conclusion of Cause

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The investigators found that the primary cause of the accident was that captain van Zanten proceeded with take-off without clearance from the tower, with other factors of the crash being the fog that quickly descended on the airport and the interference from multiple radio transmissions (Official Report, 1978, pp. 61-62). However, had the KLM captain spoken up and stated that he did not hear the instructions or had the KLM crew said they were not comfortable going forward with take-off without explicit clearance from the tower, the accident may not have happened at all. Modern leaders can learn lessons from this horrific accident, however, and should see the need to speak up when necessary. Sometimes, speaking up is for clearing up miscommunications, and sometimes it could be to push for a new technology essential to the organization. In any case, organizational leaders are ultimately responsible for speaking up when needed.

Many issues and misunderstandings led to the staggering loss of life recorded on the day of the Tenerife airport disaster. Still, it is crucial to understand the improvements that have resulted from the accident. Communication guidelines have become much more strict and regulated, while hierarchical structures within flight crews have become much more relaxed. These changes have led to the more precise, inclusive forms of communication that can be witnessed today between aircraft pilots and air traffic controllers, giving some credence to the people who lost their lives on the runway in Tenerife.

References

Andriole, S.J. (2014). *Ready Technology: Fast-Tracking New Business Technologies*. CRC Press.

Baron, R. (2011). The cockpit, the cabin, and social psychology. Global Operators Flight Information Resource. http://www.gofir.com/general/crm/index.htm

Radio Telephony Manual. (Edition 15). Cap 413.

Dreifus, E.D. (1978). Official Report. http://www.project-tenerife.com/engels/PDF/Tenerife.pdf

Eisenberg, E.M., Trethewey, LeGreco, M., Goodall, Jr., H.L. (2017). *Organizational Communication: Balancing Creativity and Consent*. Bedford/St. Martin's

Roitsch, P.A., Babcock, G.L., Edmunds, W.W. (1977), Human factors report on the Tenerife accident, Aircraft Accident Report. http://www.project-tenerife.com/engels/PDF/alpa.pdf

Smith, P. (2002). Air travel's communications killer. *Salon*. http://www.salon.com/2002/03/28/heterodyne/singleton/

The Tenerife airport disaster: the worst in aviation history. (2018). http://www.tenerife-information-centre.com/tenerife-airport-disaster.html

Weick, K.E. (1990). The vulnerable system: an analysis of the Tenerife air disaster. *Journal of Management, 16*(3), pp. 571-593. http://eres.regent.edu:2048/login?url=https://search-proquest-com.ezproxy.regent.edu/docview/215257407

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