Fall 2003

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Ping I Lee

INTRODUCTION

On April 26,1994, China Airlines (CAL) Flight 140, service from Taipei, Taiwan to Nagoya, Japan, crashed near Nagoya International Airport while attempting an Instrument Landing System (ILS) approach to Runway 34. The fully loaded Airbus 300-622R stalled at an altitude of approximately 1,500 feet which resulted in a fiery crash that killed all 264 onboard (Sogame, Ladkin). This tragedy was not the first fatal crash to the Taiwanese carrier. In fact, CAL has suffered numerous fatal crashes since its establishment, and it has been rated as one of the most dangerous airlines in the world (Schultz). Many argued that the carrier's infamous safety record was a direct result of the culture barriers experienced by its flight crews.

Most people agree that Chinese culture is dramatically different from most other cultures. Many researchers also believe that these cultural differences are the fundamental cause of the poor safety records in most Asian nations. The purpose of this research paper is to examine the characteristics of Chinese culture and its relationship with aviation human factors (AHF). This paper will also examine the possibility of adapting the concept of Crew Resource Management (CRM) to improve flight safety.

HISTORY OF CHINA AIRLINES

CAL was founded by 26 ex-Taiwanese Air Force Pilots in 1959. Although registered as a civilian commercial carrier, CAL was, in feet, a covert joint project between the Taiwanese Government and the United States' Central Intelligence Agency (CIA). The flight crews for CAL were all military aviators, and the carrier's primary mission was to conduct high-risk covert flights into Southeast Asia (Liu 1993).

After the conclusion of the Vietnam War, CAL became Taiwan's flag carrier. However, the airline is still operated by the government and dominated by Taiwanese Air Force personnel. Unlike most privately owned airlines, CAL does not emphasize flight safety and CRM. As a result, the carrier has experienced numerous safety problems. The troubled carrier has suffered six major accidents involving 699 fatalities within the past decade (Sogame, Ladkin). Many AHF researchers have argued that the primary reason for CAL's poor safety record is a direct result of culture conflicts (Jing, Lu, and Peng).

CHARACTERISTICS OF CHINES CULTURE

It is critical for one to understand certain characteristics of Chinese culture before examining its effects on flight safety. This section of the paper will attempt to briefly introduce several characteristics of the Chinese culture.

Individualism

One of the most fundamental differences between non-Chinese and Chinese cultures is the idea of individualism. Most nations encourage the development of individualism, and one is rewarded for expressing his/her own opinion. However, individualism is strongly discouraged in the Chinese society. This practice is strongly rooted within the culture. Chinese children are taught at a young age to listen and not speak, and speak when only spoken to. This practice is evident in a popular Chinese saying "God provided us with two ears and only one mouth because we should listen more and speak less." This belief resulted in the development of collective thinking. Chinese will seldom express his/her own opinion during social settings such as conferences, lectures, and even intra-cockpit communications.

Social Pressure

Unlike non-Chinese culture, Chinese culture is a shame culture. Chinese grow up sensitive to pressure from the

society instead of their internal feelings. Many cultures emphasize honor systems or codes of honor. These measurements are often solely based on one's internal feelings of guilt, and rely heavily on one's own judgments. Such a system could not be implemented in Chinese culture, since most Chinese believe in social pressure, and it is often society that determines one's belief system. As a result, it is a common practice for Chinese to cut corners, since it is widely accepted practice by the society. In fact, those who cut corners are often rewarded for increased efficiency.

This cultural characteristic can have serious results. According to a study conducted by the Taiwanese Naval Academy, people in Chinese society could easily break rules, operating procedures, and even the code of law when it is acceptable to society. Due to the same social pressure, Chinese would view such behaviors as righteous and even encourage it (Lu, Chang, Wang, Yang, Hao,Li, et al).

Authoritarianism

Chinese culture is based on 5000 years of dictatorships. As a result, authoritarianism has an important role in the society (Jing et al). Figures of authority, such as professors, managers, and airline captains are treated with a great amount of respect from their subordinates. Unlike cultures where this relationship only exists in the working environment, Chinese subordinates treat their superiors with respect regardless of environments and conditions. This relationship between superior and subordinate may be seen during daily interactions. In Chinese society, eye contact with a figure of authority is considered disrespectful, and as thus, is strongly discouraged.

It is also a common belief that a figure of authority is error free. Thus, it is considered an outrage when a Chinese subordinate challenges a figure of authority. A figure of authority will not allow such a challenge, nor would they admit their errors. This is because of the fear of losing face. The term "face" in Chinese signifies one's dignity and prestige (Crossing the culture). It is often the subordinate's responsibility to mainftiin the superior's face, and thus maintain the harmony of the group.

CHINESE CULTURE IN THE COCKPIT

It is clear that there are significant cultural differences between Chinese and Western societies. Certain characteristics within the Chinese culture could prove to be potentially hazardous in the field of aviation. The following pan of this paper will examine the Chinese cultural influences in the cockpit.

As a result of the Nagoya tragedy, the official Japanese investigation report recommended C AL ensure that Cockpit Resource Management is performed most effectively when the CAP (captain) has the F/O (first officer) performing the PF (pilot flying) tasks (Sogame, Ladkin). However, according to the previous analysis of Chinese culture, one can easily realize the challenges in compliance with these recommendations.

Chinese culture is not only deeply rooted in the society, but it also influences Chinese cockpit crews. Captains are often viewed by Chinese as figures of authority, thus, Chinese captains are seldom challenged by their first officers during flight operations even if they have committed serious safety violations. One of the best examples of this practice is an accident which occurred on November 4,1993 when a CAL 747-400 landed long into Hong Kong's Victoria Bay after its final approach to Hong Kong's Tai Kai International Airport. According to the post accident interview, the first officer was well aware of the fact that his captain (pilot flying) was approaching the runway with excess airspeed, and the aircraft would not be able to stop on the runway. However, in an attempt to save the captain's face and fearing to challenge the figure of authority, the first officer did not caution the captain regarding the imminent danger. This ultimately resulted in the accident (Crossing the culture). The influence of authoritarianism was further noted when CAL dismissed the first officer while the carrier filed only a punitive letter against the captain.

The effects of social pressure are also noticeable between CAL's cockpit crews. It is a common practice for certain CAL captains to conduct flight operations with a set of written procedures. These so called "cheat sheets" are sets of procedures, mostly radio communications dialogs with air traffic controllers. These cheat sheets provide captains precise dialog during each specific portion of flights, (e.g. if the cheat sheet instructs the captain to report airport in sight 10 miles from the destination airport. The captain would make such report regardless of weather conditions.) It is obvious that most of these procedures are not approved or allowed by CAL's operation manual. However, since such practice is widely used by most captains within the carrier, it is socially acceptable by others. Due to such social pressure, although prohibited, such practice is widely spread between CAL's captains, and even encouraged.

OBSERVATIONS AND SUGGESTIONS

Chinese CRM Programs

It is clear that Chinese culture could potentially create breakdowns in crew communications and create hazardous situations. As part of the aftermath of the Nagoya accident, CAL has devoted tremendous efforts to introduce and educate its pilots with modern CRM concepts. The carrier introduced a new CRM program from Lufthansa, one of Europe's safest commercial carriers. All pilots underwent courses and Line Oriented Flight Training (LOFT) using the new CRM techniques. Although all flight crews were introduced to this new concept, it was no match for the deeply embedded culture within the pilots. The carrier suffered another fatal accident in 1998 when an Airbus 300-622R crashed while approaching Taipei International Airport. The airliner stalled at an altitude of 1200 feet, and all 182 onboard and 20 people on the ground were killed. It was later determined that some of the contributing causes of this tragedy included a breakdown in crew communication, and the crews' deviation from standard operation procedures. This tragedy proved that there were obvious difficulties for Chinese crewmembers in adopting and applying Western CRM concepts.

The concept of CRM has been viewed by many as the solution for increasing flight safety since its introduction in the 1970s. Fourth generation CRM programs emphasize concepts such as automation, fatigue, and cabin/cockpit crew coordination (Maurino). According to Maurino, it is a common belief by many airline managers that CRM is a "culturally free" concept. Many believed that a well developed CRM program could be easily transferred between different cultures. This belief is shared by many airline managers within Asian nations, thus, many Asian carriers, such as China Airlines, still educate their pilots by utilizing Western CRM programs. Although exposed to these advanced CRM concepts, many Asian pilots have difficulty in adopting and applying these approaches in an Asian cockpit, thus most of these CRM programs have very limited success within Asian carriers. It is clear that currently, only a culturally sensitive CRM program could be effective in increasing crew communication and improving flight safety.

Many AHF experts believe that the introduction of a new generation of CRM could successfully resolve the cultural conflicts faced by today's programs. According to Helmreich and Wilhelm (2002), the fifth generation CRM concept could serve as a universal approach to enhance flight safety and crew coordination. The primary characteristic of this new approach is its focus on human error management instead of human error avoidance. Since the concepts of human error are universal, this approach could be adopted in different cultures. It is clear that the development of human error avoidance is culture specific since each culture has a unique approach towards human error and conflict resolution. However, since the new CRM concepts emphasize management of human errors, it is less culturally sensitive and therefore may be applied universally to different cultures.

This writer believes that it is critical for CAL to develop its own culturally sensitive CRM program utilizing concepts from both fourth and fifth generation CRM programs. It is clear that only a program developed for the Chinese culture would be most effective and acceptable for flight crews in CAL. Such a program should be developed by conducting combinations of line audits and crew interviews. It is critical to utilize a third party to work with CAL's AHF experts to design and conduct this program. Crew resistance could be expected during the initial stages of the development process. However, this writer believes the long term benefit of such a CRM program could easily outweigh the temporary inconveniences.

Incident Reporting System

In Taiwan, accidents are often one of the few sources for improvement in flight safety. Although accident investigation is a critical aspect of flight safety, preventing accidents from occurring should be the primary objective of flight safety. Aviation accidents are often the result of a series of operational errors. Thus, flight safely can be dramatically enhanced if the trend of operating errors could be identified and corrected prior to the circumstances which result in an accident. Incident investigations often provide safety experts with the trend of operating errors prior to the occurrence of an accident. According to Baker, incident investigations often create better accident prevention results than accident investigations.

One of the greatest challenges faced by Taiwanese aviation authorities and air carriers is the lack of appropriate systems for flight crews to report operation deviations and pilot errors. Although the Taiwanese aircrew confidential reporting program has been in effect since 1999, it has suffered from limited funding and low participation. It is common for a Chinese figure of authority, such as a captain, to deny any errors or wrong doing, thus, it is crucial to educate all line pilots the correct

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mental models of human errors. Using concepts from the fifth generation CRM, crews must realize that occurrences of human error are often part of the flight operation. Thus, one should learn to manage and report such errors instead of concealing them. The Taiwanese incident self-reporting program would only be successful with cooperation from its participating flight crews. *Pilot Training Process*

The other contributing factor to CAL's poor safety record is its pilot selection and training process. Unlike most nations, general aviation does not exist in Taiwan, thus airlines can only select its pilots from the military or conduct its own ab initio training programs. As a result, military aviators have long been the primary candidates for CAL's pilot selection programs. These aviators are experienced, well trained, and easily adapt to operating an airliner. It is also clear to CAL's managers that utilizing these air force pilots will reduce training costs dramatically. Thus, the majority of CAL pilots are retired military aviators.

Although military pilots require minimum training, many of these candidates also lack the mental model of an air transport pilot. Due to the constant threats from communist China, Taiwanese armed forces emphasize the development of tactical skills and the ability to accomplish combat missions. Thus the Taiwanese military trains its pilots to accomplish their missions at all costs. As a result, flight safety has often been disregarded in the military community. One of the examples of such practice is the go-around syndrome. It is common for the military aviators to reject go-around during a bad approach. Since they perceive a go-around signifies the lack of skills and failure, most Taiwanese aviators would attempt to conduct landings under hazardous conditions. If a successful landing were accomplished under hazardous conditions, it often viewed by others as a demonstration of excellent airmanship. There are few doubts that this practice is an unsafe act, ignoring all safety regulations, however, since safety is not the primary concern of the military, such acts are socially accepted and pilots are even encouraged to perform these hazardous operations. Sadly, many military pilots maintain the same attitude while serving the traveling public. In fact, the 1998 Taipei's tragedy was partly caused by the crews'

refusal of go-around on an unstable approach.

This writer believes the solution for this problem lies in the selection methods for Taiwanese pilots. It is clear that the military established its training methods and criterion from necessity. However, without an appropriate transition training, these military aviators are potential hazards within the civilian aviation industry. Civilian carriers should establish clear standards and aptitude tests during pilot selection process, and reduce its reliance on military pilots. This writer believes that the most effective solution to such problem is to establish airline flight training academies. There are few doubts that tactical flying is very different compared to passenger transports. The military often bases its selection of pilots upon one's aggressiveness and ability to work under highly stressful combat situations. It is obvious that civilian air carriers do not require all the characteristics of a military pilot. Air carriers could easily select appropriate applicants for air carrier operations with an established flight training institution. Carriers could also introduce concepts such as CRM and proper flight procedures during initial stages of flight training. This writer believes that a rigorous selection process, and proper comprehensive flight training could dramatically improved flight safety for Taiwanese airlines. **CONCLUSION**

Overall, it is clear that the Chinese culture plays a significant role in CRM and flight safety. However, these cultural characteristics have often been overlooked by most Taiwanese authorities. As a result, the majority of Taiwanese flight crews are experiencing difficulties in utilizing modern CRM concepts within a Chinese culture oriented cockpit. These deficiencies often result in deviations from operating procedures, breakdowns in crew communication, and fatal accidents. This paper has identified several unique characteristics within the Chinese culture and their effects in today's multi-crew cockpit. There are few doubts that certain cultural practices could become potential hazards in flight operations. However, this writer believes that the key to resolving these concerns is to develop proper training procedures adopting these cultural traits. Only a proper training program designed to incorporate the unique cultural traits can be successful and accepted by Chinese crewmembers.*

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