SITUATIONAL LEADERSHIP IN UNITED STATES AIR FORCE

AIR TRAFFIC CONTROL TOWERS

By

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I dedicate this work to my life's inspiration, my mother, Brenda Hart. She instilled in me a drive and work ethic that has fueled my every endeavor in life. Thank you momma, and always remember, I love you, and it is you, who makes me, proud.

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Abstract:

On December 17, 1903, the world as man knew it from the dawn of time changed. Orville Wright broke the bounds of Earth's gravity in controlled flight and in slightly more than a century that singular flight manifested into over 18 million annual worldwide flights. As the skies became more crowded it became necessary to develop a means to maintain safety, and the air traffic control profession was born. Developing into what is often considered one of the most stressful occupations, leadership in air traffic control facilities is critical the safe, orderly, and efficient flow of air traffic. The purpose of this qualitative study was to determine the preferred leadership style for United States Air Force air traffic control tower watch supervisors. A panel of 10 functional experts completed a 25 question, scenario based survey to establish a baseline for this study's four research questions. A purposeful sample of eight control tower chief controllers representing the eight United States Air Force major commands were interviewed and their responses were compared to the mean of the experts panel. The data from the interviews was analyzed and in addition to the straight forward responses to the research questions two themes emerged: the role of the monitor and apprentice controller's role in emergency situations. The study discovered that United States Air Force control towers are fully implementing the fundamentals of situational leadership. The eight interviewee's responses mirrored the expert panel's answers. The results of this study provide control tower chief controllers, watch supervisors, and future watch supervisors a frame of reference on how situations are handled across the spectrum of facilities.

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CHAPTER 1

INTRODUCTION

Air traffic control is one of the most dynamic and stressful jobs in the world. In the United States Air Force (USAF), it is not uncommon for 18 year old Airmen to arrive at an air traffic control tower to begin on the job training after graduating from the four month basic air traffic control training course. Each controller is responsible for multiple multimillion dollar aircraft and hundreds of human lives each time control instructions are transmitted, therefore, control tower leadership is essential to maintaining a safe, orderly, and effective flow of air traffic. Air traffic control watch supervisors must be able to transcend a solitary leadership style and when driven by the situation, morph from delegating to directing in a split second. Due to the fluid nature of the job, ever changing traffic conditions, and personality makeup of the personnel involved, air traffic control is the perfect occupation to explore situational leadership.

United States Air Force air traffic controllers facilitated approximately 6.3 million aircraft operations in 2011 (Kahne, 2011). These numbers include domestic, international, and combat zone aircraft missions, referred to as sorties. By its very nature, air traffic control is a stressful profession, however when you combine youthful inexperience and combat environments it becomes a true pressure cooker. Although the majority, 64%, of operations was military aircraft, USAF air traffic controllers proved their mettle by also assisting civilian pilots (Kahne, 2011). General aviation aircraft accounted for 27% of that total while commercial aircraft contributed 8% (Kahne, 2011). The final 1% of aircraft operations truly separated USAF air traffic controllers from their Federal Aviation Administration brethren, unmanned aerial systems, which

had to be blended in with faster, more maneuverable aircraft (Kahne, 2011). Approximately one third of all operations were either combat or combat support sorties (Kahne, 2011). USAF air traffic controllers provide services from 68 control towers and 38 radar facilities worldwide (Air Force Personnel Center, 2012).

Although USAF air traffic controllers complete one of the most complex training regimens in the Air Force, it is simply impossible to train on every situation a controller may encounter. This is where the on-duty subject matter expert, the watch supervisor, intervenes.

There are many definitions of leadership, however for the sake of this study, Air Force Doctrine Document 1-1 defines leadership as "the art and science of influencing and directing personnel to accomplish the assigned mission" (p.1). This definition takes into account two equally important components: personnel and mission (Air Force Doctrine Document 1-1, 2006).

Just as there are many definitions of leadership, there are numerous models to illustrate or define leadership styles. This study utilized Hersey & Blanchard's Situational Leadership Model. Figure 1 illustrates the four leadership styles: directing, supporting, coaching, and delegating, as well as the two behaviors: supportive and directing. An additional factor for supervisors to consider is the developmental level of their subordinates. Figure 1 also incorporates subordinate development and suggests supervisors match subordinate development with the identical color coded leadership style. This is suggestive in nature and offers an approximate correlation.

Figure 1 Hersey and Blanchard's Situational Leadership Model

Purpose of the Study

This study examined the leadership styles utilized in United States Air Force air traffic control towers. Although the United States Air Force provides leadership training at various points of an Airman's career, leadership is a constantly evolving dynamic. The more comfortable leaders are in given situations the more apt they are to make the right decisions in a critical moment. The information gathered via this study assisted in reducing the learning curve for new air traffic control watch supervisors.

Research Questions

The following four questions were used to guide this study:

1. What leadership style does a watch supervisor employ during normal operations when a fully certified controller is in position?

2. What leadership style does a watch supervisor employ during emergency or complex operations when a fully certified controller is in position?

3. What leadership style does a watch supervisor employ during normal operations when an apprentice controller is in position?

4. What leadership style does a watch supervisor employ during emergency or complex operations when an apprentice controller is in position?

Benefits and Significance of this Study

Air traffic control is a very financially rewarding profession. Although the USAF continually assesses staffing levels and provides qualified controllers an enticing financial incentive to remain on active duty, the compensation package offered by the FAA is readily sought by many controllers. Consequently, the air traffic control career field is in a constant state of flux. According to Chief Master Sergeant Joe Kirk, USAF air traffic control career field functional manger, the USAF air traffic control career field is only staffed at 68% for the top five enlisted grades (Kirk, 2012). These grades are the primary watch supervisors in control towers, so it is vital that every supervisor be as aware as possible of any leadership tool available. Figure 2 below illustrates the number of authorized (auth) and assigned (asgn) personnel in each rank.

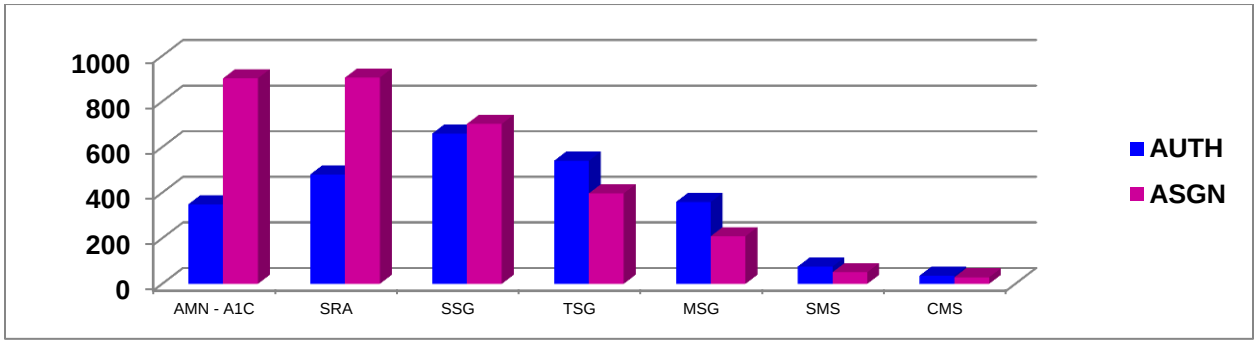

Figure 2 Current USAF manning

The Air Force has established a broad generic training program that all potential watch supervisors must complete in combination with a much more detailed locally developed program prior to assuming watch supervisor duties. This study benefited all supervisors, but particularly

new watch supervisors by enabling each to compare their particular leadership style to the preferred style as determined by a panel of experts and USAF control tower chief controllers from around the world.

Definition of terms

Apprentice Controller- an individual who completed the basic air traffic control technical training school. Apprentice controllers require a qualified monitor anytime they are working live traffic (Air Force Instruction 13- 204, 2010).

Career Field Education and Training Plan-A comprehensive core training document identifying life cycle education and training requirements, training support resources, core and home station training, and deployment/UTC task requirements for a specialty (Air Force Instruction 13- 204, 2010).

Chief Controller- responsible for managing the overall ATC radar or tower facility operations, as well as directly supervising assigned personnel.

Position certification- endorsement by authorized agent that the controller has demonstrated the competence, qualifications and skill required to perform in a specific operating position (Air Force Instruction 13- 204, 2010).

Facility rating- endorsement by authorized agent signifying the controller has earned all position certifications required to control traffic with a particular air traffic control facility (Air Force Instruction 13- 204, 2010).

In-flight Emergency- a distress or urgency condition declared by either the pilot in command of the aircraft, air traffic control, or agency responsible for the operation of the aircraft (JO 7110.65U, 2012).

Qualification Training Package—An instructional package designed for use at the unit to qualify, or aid qualification, in a duty position or program, or a piece of equipment. It may be printed, computer-based, or in other audiovisual media. QTPs do not require third-party certification and evaluation (Air Force Instruction 13- 204, 2010).

Skill level- The level of qualification within an awarded Air Force specialty, shown by the fourth digit of the Air Force Specialty Code (Air Force Instruction 13- 204, 2010).

Special Experience Identifier- A three-character code that identifies special experience training not otherwise identified in the personnel data system. Specialty Experience Identifiers may permit rapid identification of individuals with special qualifications to meet peacetime assignments. They provide a means for identifying critical manning requirements during wartime or contingency operations when little lead time is available for training personnel in specific technical skills (Air Force Instruction 13- 204, 2010).

Watch Supervisor-The individual responsible for the overall operations of an air traffic control facility during their shift and maintains general situational awareness of air traffic operations at the facility assigned, and is responsible for all ATC facility operations and services during their shift (Air Force Instruction 13- 204, 2010).

CHAPTER 2
REVIEW OF LITERATURE

Chapter Structure

The literature review consisted of four separate and distinct areas: air traffic control, United States Air Force air traffic control, leadership and situational leadership. Each area was reviewed individually.

Air Traffic Control

December 17, 1903, the world changed forever. Orville Wright left the bounds of Earth's gravity in the Wright Flyer and although historic, the flight hardly gave birth to an entire industry. Many people were skeptical and even belittled the Wright brothers' accomplishment. Aviation remained a novel idea to most Americans until World War I (Nolan, 2010).

Following the "war to end all wars," interest in aviation across the United States began to grow expediently. Much of the credit for the newfound interest in aviation was credited to barnstorming daredevil pilots who toured the U.S. performing aerial shows (Bilstein, 2001). The Post Office Department began Air Mail service in 1918, and for the next five years most flights were conducted during primarily daylight hours (Nolan, 2010). In 1921, an early crude night navigation system was established by igniting bonfires along a pilot's route of flight (Nolan, 2010). In 1923, bon fires were replaced by electron and gas arc lighting between Columbus and Dayton Ohio and the following year, an airway from Cheyenne, Wyoming to Chicago, Illinois as

illuminated and used for night flights (Nolan, 2010). In 1925, the first legislation governing aviation was enacted, the Contract Air Mail Act, or the Kelly Act as it is more commonly called (Wells & Wensveen, 2004). Wells and Wensveen (2004) stated "The Kelly Act authorized the postmaster general to contract with private individuals or companies engaged in the air transportation of air mail" (p.60). The Kelly Act gave way a year later to broader legislation, which Wells and Wensveen (2004) characterized as the pioneer of aviation legislation, the Air Commerce Act of 1926.

The Air Commerce Act of 1926 "authorized the Department of Commerce to encourage and develop facilities necessary for air navigation and to regulate and maintain them" (Wells & Wensveen, 2004, p. 60). Wells and Wensveen further stated:

> The objective of the Air Commerce Act was to stabilize civil or commercial aviation in such a way as to attract adequate capital to the fledgling industry and to provide it with the assistance and legal basis necessary for its development. The law emphasized the federal government's role in the development of civil air transportation more than it stressed its responsibility for regulating the business aspects of air transportation. (p. 60-61)

Another significant contributor to early navigation was Elrey Jeppesen. This incredibly forward thinker grew tired of seeing many of his fellow pilots perish in crashes and started making accurate annotations in his little black notebook of airfield lengths, slopes, obstacle heights and locations, and lighting in the area (The Elrey D. Jeppesen Story, 2010). Jeppesen even recorded telephone numbers of local farmers who provided him weather reports (The Elrey D. Jeppesen Story, 2010). Jeppessen's prowess for detail soon spread throughout the pilot community and other pilot's paid for copies of his book. This would be the dawn of instrument approach procedures enabling pilots to navigate effectively during inclement weather conditions.

The spark which ignited the powder keg of aviation interest in the United States occurred in May 1927, with Charles Lindbergh's solo transatlantic flight. Lindbergh, now a celebrity, toured the United States demonstrating the airplane as a safe and reliable mode of transportation (Wells & Wensveen, 2004). Aircraft industry stocks began to rise and the following year saw the launch of four U.S. legacy airlines, Northwest, American, United, and TWA (Nolan, 2010). The skies were now becoming more crowded and the advent of night and instrument flying necessitated a more structured system. St. Louis hired the country's first air traffic controller, Archie League, in 1929, and a profession was born (Nolan, 2010).

It is hard to envision now how League controlled traffic. According to Nolan (2010), "League controlled from a wheelbarrow which he packed every morning with a notepad, water, two flags and his lunch" (p.5). League would utilize a red flag to instruct aircraft to stop, and a checked flag to clear them for takeoff (Nolan, 2010).

In the following years, more and more aircraft took to the skies leading Congress to establish the Bureau of Air Commerce in 1934 to regulate air traffic (Nolan, 2010). This regulatory body created instrument flight rules for flight on airways (Nolan, 2010). However, following the Great Depression, the federal government lacked the fiscal ability to fund an air traffic control system and actually tasked the airlines to formulate air traffic control units responsible for separating aircraft on airways (Nolan, 2010). After several fatal aircraft crashes where the airlines blamed the lack of control measures and the Bureau of Air Commerce blamed the pilots, President Roosevelt and Congress worked together to pass the Civil Aeronautics Act of 1938 (Nolan, 2010). As a result of this act, the Bureau of Air Commerce gave way to the Civil Aeronautics Administration (CAA) which became the only independent authority in the federal government at the time (Nolan, 2010, p. 61). The Civil Aeronautics Act provided that the CAA

certify air traffic controllers working in control towers, many of which were still owned by local municipalities (Nolan, 2010).

For more than a decade, the air traffic control system was continuously tweaked but bigger faster aircraft coupled with very loosely enforced rules set events in motion for a significant accident. It was only a matter of time before a midair collision occurred, and on June 30, 1956 a Trans World Airlines (TWA) Super Constellation collided with a United Airlines DC-7 over the Grand Canyon as a result of an air traffic controller's error (Nolan, 2010). The accident killed all 120 personnel on the two planes, leading to a public outcry for a modernized air traffic control system.

The CAA gave way to the Federal Aviation Agency (FAA) via the Federal Aviation Act of 1958. Unfortunately, air traffic control rules and procedures have always been considered "blood regulations." A blood regulation simply means that a tragic event has to take place before a rule is instituted. In 1960, another midair collision between United and TWA aircraft occurred, this time in New York City killing all 128 people on board the aircraft and six people on the ground due to insufficient air traffic control equipment (Nolan, 2010). As a result, Congress created the Department of Transportation as a cabinet level position in 1967, and the FAA was redesignated as the Federal Aviation Administration (Nolan, 2010).

Aircraft operating within the National Airspace System (NAS) either operate under instrument or visual flight rules. The Aeronautical Information Manual (2012) defines the National Airspace System (NAS) as:

> The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system

components shared jointly with the military. (PCG N-1)

Visual flight rules (VFR) place the onus on the pilot to see and avoid other aircraft, obstacles and terrain. When operating VFR, pilots must remain 500 feet below, 1,000 feet above or 2,000 feet laterally from clouds (14 CFR Part 91 Section 155, 1993). Pilots operating under VFR are not required to contact air traffic control unless transiting Class B, C, or D airspace. Pilots are not authorized to operate VFR in Class A airspace. Federal Aviation Administration Order 7110.65 (2012) defines each class of airspace as follows:

> CLASS A− Generally, that airspace from 18,000 feet MSL up to and including FL 600, including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.
>
> CLASS B− Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspaces areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds."
>
> CLASS C− Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually

tailored, the airspace usually consists of a surface area with a 5 nautical mile (NM) radius, a circle with a 10NM radius that extends no lower than 1,200 feet up to 4,000 feet above the airport elevation and an outer area that is not charted. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.

CLASS D− Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft. (PCG-C-6-7)

In addition to the previously described airspace, figure 3 illustrates all airspace located in the United States. Class E airspace is all other controlled airspace not previously defined, and Class G airspace is uncontrolled airspace.

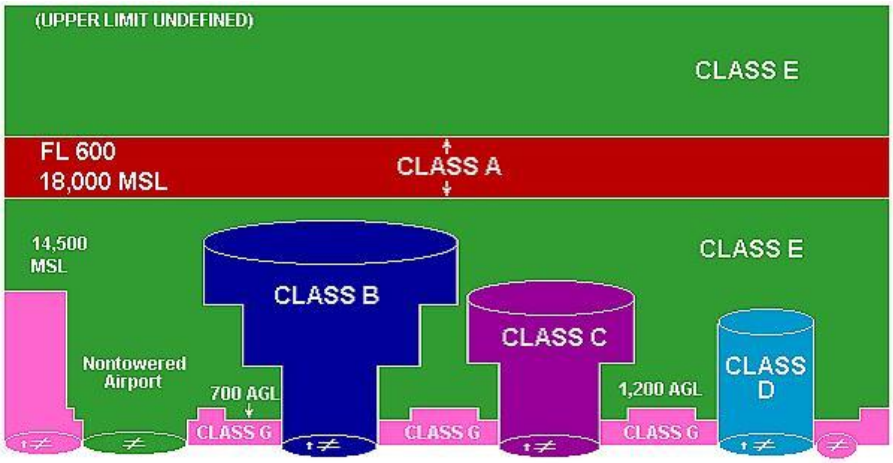

Figure 3 United States Airspace Classifications

Instrument flight rules flight (IFR) requires much more training by the pilot because as the name implies, the pilot is navigating by instrumentation and not visually scanning out the window. As a minimum, aircraft operating under IFR are afforded three miles lateral and 1,000 feet vertical separation from other aircraft (JO 7110.65U, 2012).

Aircraft range in size from small to heavy and must be separated in accordance with approved separation standards. Normal separation between multiple departures is the preceding aircraft must be at least 6,000 down the runway and airborne prior to issuing clearance to the succeeding aircraft (JO 7110.65U, 2012). Variables such as aircraft speed and weight classification must also be considered. Departing heavy aircraft, defined as an aircraft with the takeoff capability of 300,000 pounds or greater, disturb the air and create turbulence, much like the wake a speed boat creates as it travels across a lake (JO 7110.65U, 2012). This disturbance known as wake turbulence is defined as "Phenomena resulting from the passage of an aircraft through the atmosphere. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air" (JO 7110.65U, 2012, p. PCG-W-1). Wake turbulence creates unstable air and requires air traffic controllers to increase separation

between departures. Air traffic controllers are required to ensure at least two minutes elapse behind a heavy departure prior to issuing take off clearance to subsequent aircraft (JO 7110.65U, 2012).

Airborne aircraft are assigned altitudes based on their flight's cardinal direction. Aircraft flying a heading from 360-179 degrees, North and East are assigned odd altitudes, while aircraft heading between 180-359 degrees, South and West, are assigned even altitudes (JO 7110.65U, 2012). This is referred to as NEODD (KNEE ODD)/SWEVEN (SWEE VIN) and ensures aircraft travelling opposite direction are procedurally separated. With a few specialized exceptions, aircraft operating under instrument flight rules require 1,000 foot vertical separation, so an eastbound aircraft would be assigned and maintain an odd altitude (7,000, 9,000, 21,000 etc) while a westbound flight would be assigned and maintain an even altitude (8,000, 10,000, 22,000 etc). Dependent upon the area of jurisdiction and volume of traffic, controllers also use lateral separation in conjunction with vertical separation.

Federal Aviation Administration JO 7110.65U (2012) requires instrument flight rules aircraft be separated laterally by three miles within the terminal environment and five miles en route. On the surface, this sounds like a great distance, but bear in mind the closure rates of aircraft often exceed 800 miles per hour. More stringent, wake turbulence separation is required for any aircraft operating behind a heavy aircraft. Controllers must ensure the following wake turbulence exists: heavy following heavy aircraft, 4 miles, large or heavy aircraft following a B757, 4 miles, small behind a B757, 5 miles, small or large behind a heavy 5 miles (JO 7110.65U, 2012). Additionally, small aircraft conducting instrument approaches are afforded even more separation: small behind a large, 4 miles, small behind a B757, 5 miles, and small behind a heavy, 6 miles (JO 7110.65U, 2012). The B757 does not meet the definition of the

heavy aircraft but due to the location and power of its engines must be treated differently than other aircraft in its weight class. Figure 4 below depicts a real time snapshot of airborne traffic in the United States. Applying the aforementioned separation to each of these aircraft is like a mindboggling 300 mile per hour chess game; with much larger stakes than merely losing a pawn!

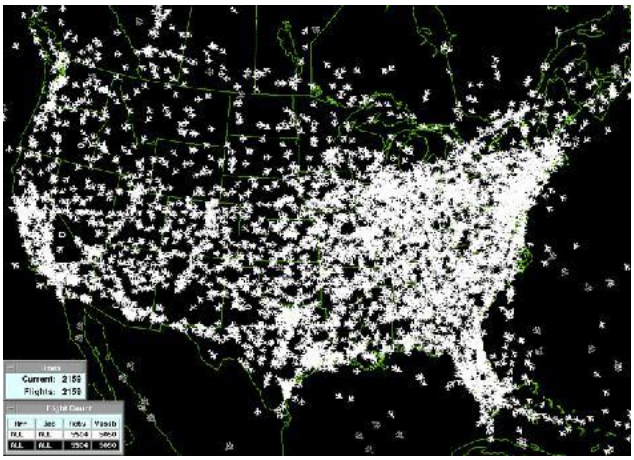

Figure 4 Real time snapshot of airborne aircraft in the United States

In the United States, the majority of the air traffic controllers are federal employees employed by the FAA. Unless a candidate has prior military air traffic control experience the following conditions must be met for initial employment as a controller (CFR 91 Title 14 Subpart B, 2012):

- Be a U.S. citizen
- Not reached the age of 31
- Pass a Class II flight physical examination
- Pass a security examination
- Have three years of progressively responsible work experience and/or a four year course of study leading to a bachelor's degree, or some combination of the two

- Speak English clearly enough to be understood over communications equipment
- Complete an interview

The Aeronautical Information Manual (2012) defines the National Airspace System (NAS) as:

> The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system components shared jointly with the military. (PCG N-1)

Figure 5 illustrates how the components of the NAS interact with each other to facilitate aircraft movement. Aircraft use a series of land based navigational aids and radars, as well as global position system satellites and area navigational waypoints to traverse our busy skies. Air to ground communications sites are erected to facilitate two way communication between pilots and controllers. Airport landing and lighting systems are vital components of the NAS which are often overlooked. They are essential for aircraft conducting approaches during periods of inclement weather or hours of darkness. Finally are the air traffic control facilities. These facilities orchestrate the aerial ballet of over 10 million flights carrying over 787 million passengers annually (Research and Innovative Technology Adminstration, 2011).

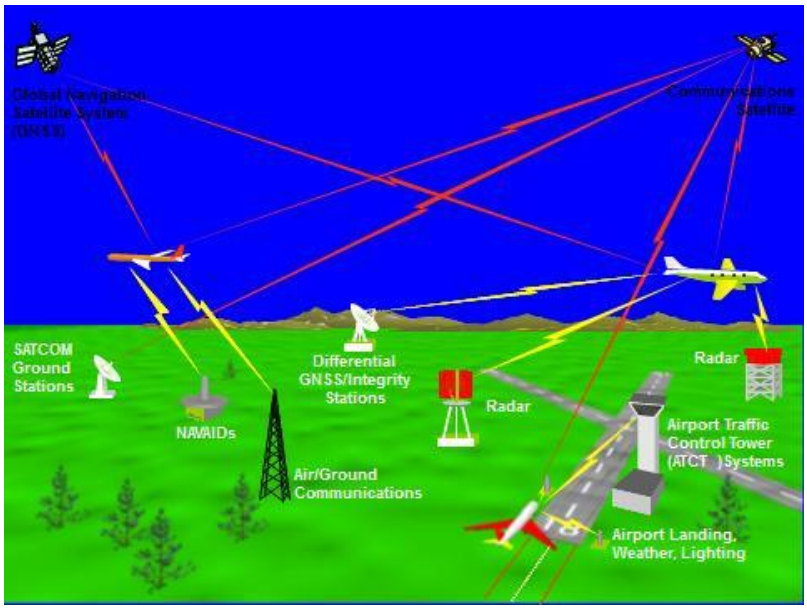

Figure 5 Components of the National Airspace System

In the United States, there are four air traffic control facilities that perform distinct roles in the safe, orderly, and expeditious flow of air traffic: Flight Service Stations, Air Traffic Control Towers, Terminal Radar Approach Controls, and Air Route Traffic Control Centers (ARTCC). Each facility, along with navigation aids are contained within the National Airspace System.

Although Flight Service Stations (FSS) are considered air traffic control facilities, they do not actively control or separate aircraft. Flight Service Stations perform other key functions such as pilot weather briefings and filing of flight plans. In October 2005, all FSS functions in the continental United States, Hawaii, and Puerto Rico were converted from the FAA to Lockheed Martin (Flight Services Program Operations, 2011). According to the FAA's Flight Services Program Operations (2011) "Due to Alaska's unique weather and topographical conditions, Alaska's flight service station facilities were not included in the contract award."

If you think of air traffic control as a funnel, you can gain an understanding of what each

control facility does. At the top of the funnel, the area is the largest and can hold the most volume. This is similar to the ARTCC's, more commonly referred to as Centers. According to FAA JO 7110.65 (2012), a center is a facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. There are 21 Centers in the United States providing expeditious service to and from terminal areas (Air Route Traffic Control Centers, 2010).

The intermediate level of air traffic control, the terminal radar approach control (TRACON), owns less airspace than a center, but also is normally responsible for the increased responsibility of sequencing arriving and departing aircraft for multiple airports. In general, the job of the TRACON is to merge en route traffic with traffic in the terminal environment. There are 159 TRACONs located in the United States, 132 collocated with control towers, and 27 stand-alone facilities (Terminal Radar Approach Control Facilities, 2011).

For the purpose of this study, only air traffic control towers will be examined closer. According to the Aircraft Owners and Pilots Association (AOPA), there are FAA control towers, 220 federally contracted towers, and 164 military control towers ensuring safe movement of air traffic (Flight Training: How it All Works, 2011). The control tower issues takeoff and landing clearances, coordinates ground movements, and is usually responsible for a five mile radius of the airport to usually 3,000 feet. Air traffic control towers normally are staffed with the following positions: supervisor, coordinator, local control, ground control, clearance delivery, and flight data. A brief explanation of the duties of each operating position is listed below.

Local Control is responsible for separation of airborne aircraft within their area of jurisdiction as well as operations on active runways. The local controller issues takeoff and landing clearances to aircraft as well as coordinates with ground control for runway crossings of

aircraft or vehicles.

Ground Control is responsible for formulating taxi routes to and from the active runway for aircraft. Additionally, ground control assists local control ensure a safe environment by scanning the runway environment for aircraft, vehicles, personnel, wildlife or anything else in an unsafe proximity to the runway. Finally, ground control maintains communication and issues instructions to vehicle operators operating in the controlled movement area of an aerodrome.

Flight Data "Operates interphones, processes and forwards flight plan information, compiles statistical data, assists tower cab in meeting situation objectives, observes and reports weather information" (JO 7110.65U, 2012, p. 2-10-5).

Clearance Delivery "Operates communications equipment, processes and forwards flight plan information, issues clearances and ensures accuracy of pilot read back, assists tower cab in meeting situation objectives and operates tower equipment" (JO 7110.65U, 2012, p. 2-10-5).

Coordinators "Perform interfacility/position coordination for traffic actions, advises the tower and the Tower Associate Position(s) of tower cab actions required to accomplish overall objectives, perform any of the functions of the Tower Team which will assist in meeting situation objectives" (JO 7110.65U, 2012, p. 2-10-5).

The supervisor is overall responsible for all actions in the control tower. Although all positions act as team, the supervisor has final authority on all matters.

United States Air Force Air Traffic Control

The Air Force Enlisted Classification Directory (2011) lists the duties and responsibilities for air traffic controllers as:

> Controls and regulates en route and terminal air traffic. Initiates and issues ATC

clearances, instructions, and advisories to ensure the safe, orderly, and expeditious flow of air traffic operating under instrument and visual flight rules. Plans, organizes, directs, inspects, and evaluates ATC activities. (p.41)

The road to becoming an USAF air traffic controller begins with the Armed Services Vocational Aptitude Battery (ASVAB). The ASVAB is a standardized test given to any potential member of the armed services. According to the ASVAB official website, the ASVAB test is designed to measure four domains: verbal, math, science, and technology, and spatial. These domains are measured via ten tests: general science, word knowledge, mathematics knowledge, paragraph comprehension, electronics information, auto information, shop information, mechanical comprehension, assembling objects, and arithmetic reasoning (ASVAB, 2012). Each area is scored individually, and four tests, general science, word knowledge, mathematics knowledge, and arithmetic reasoning are used to determine the Armed Forces Qualification Test (AFQT) (ASVAB, 2012).

The AFQT is broken down into four sections: mechanical, electrical, administrative, and general. An examinee must be in the 36th percentile to qualify for enlistment in the Air Force (Caretta & King, 2008). A potential air traffic controller must score in the 55th percentile (Caretta & King, 2008). According to the Caretta & King (2008) study there is a direct correlation between the ASVAB/AFQT score and elimination rate for potential air traffic controllers. Table 1 illustrates this statistical relationship.

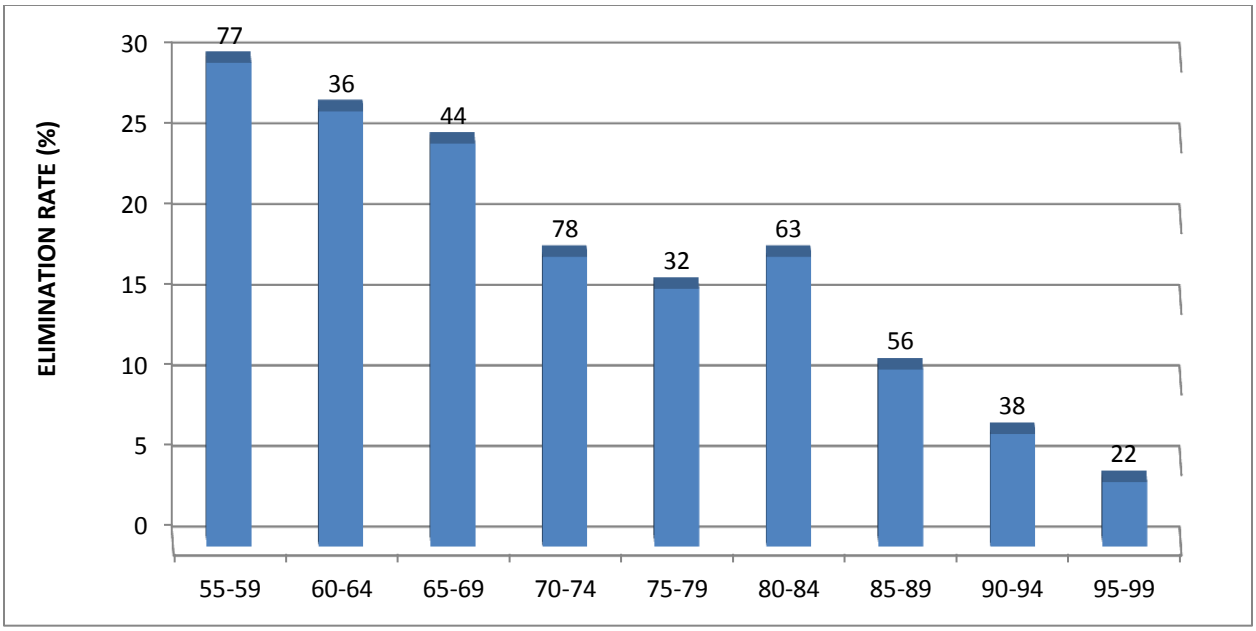

Figure 6 ASVAB study results

Of the 446 applicants in the population, 77 scored between the 55th and 59th percentile. The group's elimination rate was 30%. However, those scoring between 75th and 99th percentile averaged only a 10% elimination rate. The study clearly illustrated that AFQT scores provide a direct correlation in an applicant's ability to succeed in ATC. A separate study conducted by the USAF ATC functional manager, further demonstrated the relationship between ASVAB scores and success in the air traffic control career field. Figure 7 illustrates the average AFQT score per grouped section and their success rate within the career field (Kirk, 2012).

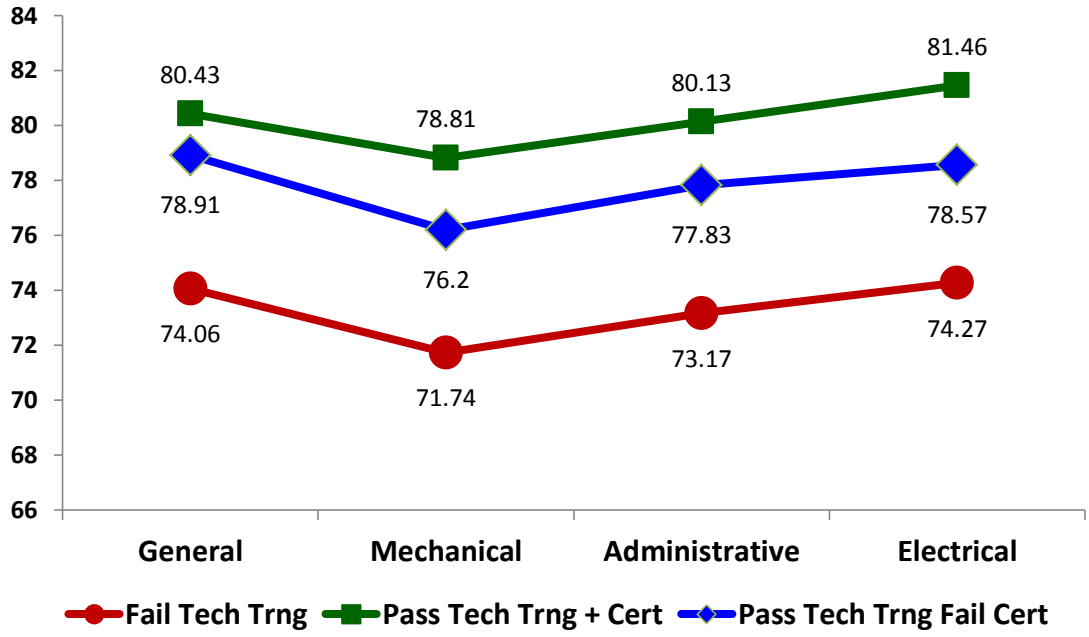

Figure 7 USAF ATC success rate based on AFQT scores

A score of 75 or higher on any area of the AFQT is a good indicator the trainee will successfully complete the technical training. If a trainee scored 79 or higher they generally not only passed technical training but earned their control tower operator certificate. Trainees who failed to complete technical training did not average 75 in any area of the AFQT.

Provided an applicant meets the minimum AFQT score, and an opening exists, they are considered qualified and assigned a technical training class date. Airmen complete the Air Force's eight week basic military training course and then they are sent to Keesler Air Force Base, Mississippi to learn the fundamentals of air traffic control. The air traffic control operator course, E3ABR1C131 000, is 72 training days or 576 hours, long. Training days are considered work days, so weekends and holidays are not included in the computation and the course is divided into five blocks of instruction.

Block one is entitled Air Traffic Control Fundamentals and consists of 66 hours or 8.25 days (Block I- ATC Fundamentals, 2011). Trainees are taught the most basic rules necessary to provide air traffic control services.

The second block of instruction is entitled Instrument Flight Rules/Radar Operations and consists of 72 hours or 9 days of training (Block I- ATC Fundamentals, 2011). Block two is a knowledge level block of instruction concentrating on teaching the students the basic rules and regulations of both radar and nonradar operations (Block I- ATC Fundamentals, 2011).

Block three consists of 198 hours or 24.75 days of training (Block I- ATC Fundamentals, 2011). Block three is an application level course of instruction where students apply the radar operation principles taught in block two (Block I- ATC Fundamentals, 2011).

Block four; entitled Control Tower Principles is 42 hours or 5.25 days in duration (Block I- ATC Fundamentals, 2011). Much like block two, block four is taught at the knowledge level, and students learn the basic information required to control air traffic operations with a control tower's airspace (Block I- ATC Fundamentals, 2011).

The final block of instruction, Control Tower Operations, is another application level of instruction evaluation of control tower principles taught in the previous block. Block four consists of 198 hours or 24.75 training days (Block I- ATC Fundamentals, 2011). Students are evaluated via scripted simulator scenarios on their ability to apply the rules and procedures taught in block three (Block I- ATC Fundamentals, 2011).

To successfully complete the course, students must earn a minimum score of 70% on all written evaluations and successfully complete all pass/fail practical evaluations (Block I- ATC Fundamentals, 2011). Historically, the USAF ATC technical training program has had a 30-35% attrition rate (Boulanger, 2011). Figure 8 below illustrates the number of students, graduates and

students eliminated from the course in the past decade along with FY 2012 and 2013 projections (Boulanger, 2011).

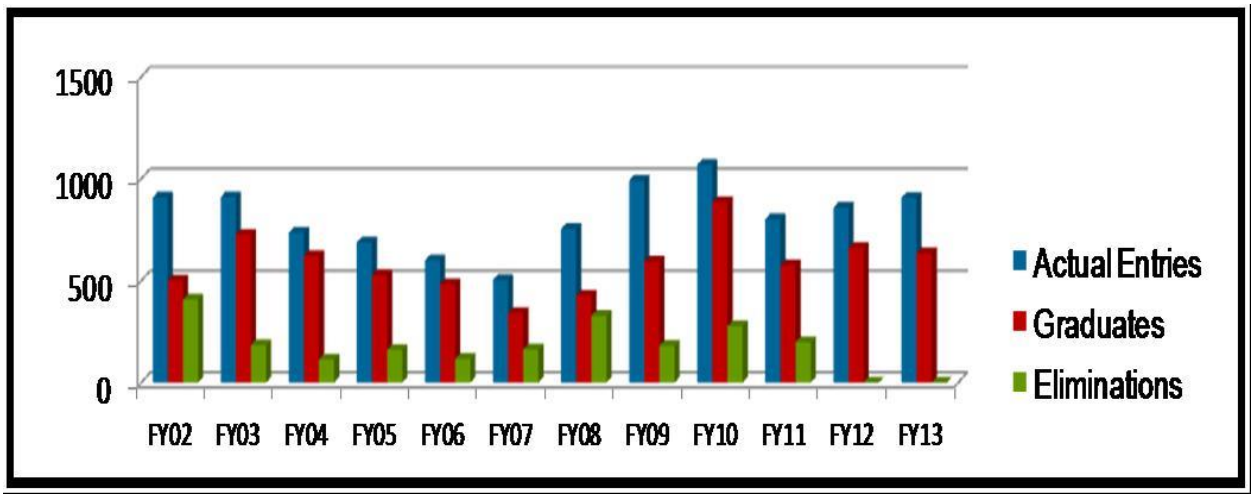

Figure 8 Ten year view of USAF ATC technical training

Following completion of the rigorous technical training syllabus, Airmen are sent to their first duty station for on-the-job training (OJT). Air Force Instruction 13-204, Airfield Operations Procedures and Programs (2010) defines OJT as "Hands-on, over-the-shoulder training conducted to certify personnel in both upgrade and job qualification training" (p.199). Although each facility has different operating positions and training standards, AFI 13-204 identifies the minimum requirements for skill level upgrade. In control towers, trainees are required to be rated in flight data/clearance delivery, ground control, and local control before they can be upgraded (Air Force Instruction 13- 204, 2010). Upon entering OJT, trainees are issued a position certification guide (PCG) for the operating position they are training in. Air Force Instruction 13-204 (2010) defines PCG as "documents prepared by the NCOIC, Air Traffic Control Training (NATCT) to assist the trainer and supervisor in logically training controllers in specific positions in a control facility" (p.199). Position certification guides provide cradle to grave training guidance on their specific position. Each facility's PCGs are different because

they incorporate the intricacies required to become a certified controller in that specific facility. Total upgrade time varies from facility to facility, however a good estimation for USAF control tower trainees is 11 months. The entire time an apprentice controller is in training, whenever they are assigned an operating position, a fully qualified controller capable of overriding any erroneous or potentially dangerous transmissions, known as a monitor is plugged in with the trainee. These monitors must not only be certified in the position they are working, but earn trainer certification from their facility as well. Requirements for trainer certification are identified later in this chapter.

Figure 9 provides controllers a road map of their career progression through the air traffic control career field education and training plan maintained in their on the job training records (Career field education and training plan, 2010).

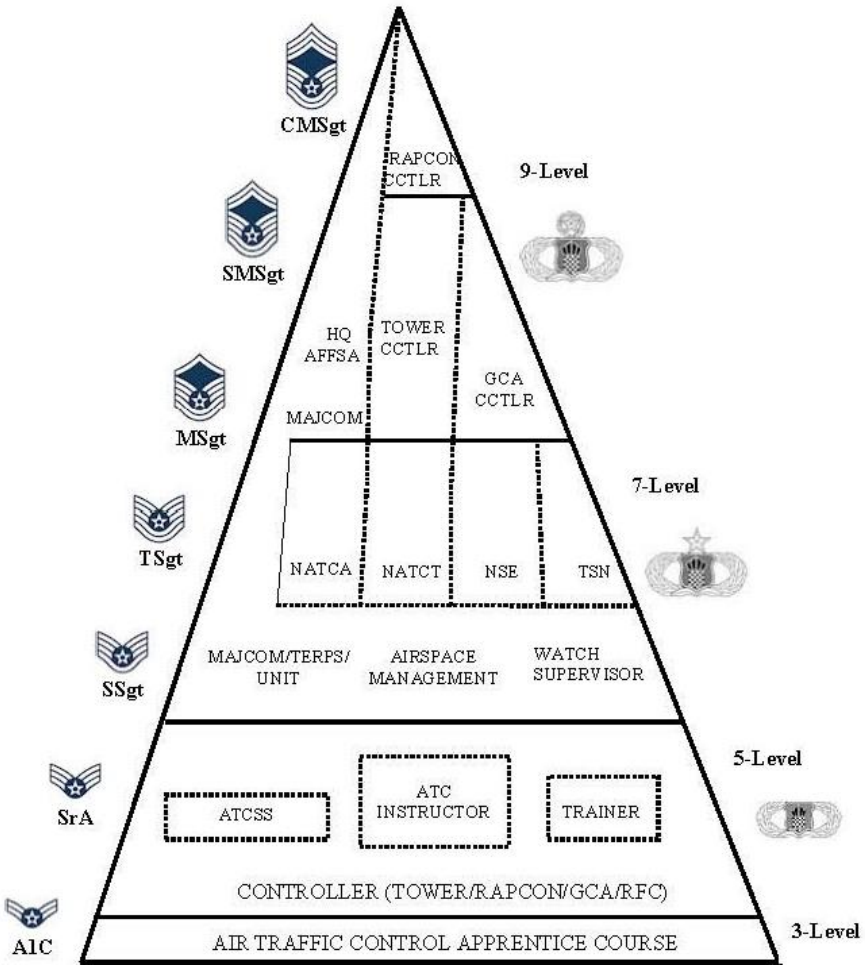

Figure 9 USAF ATC career progression chart

Air Force Instruction (AFI) 13-204 (2010) establishes procedures for USAF air traffic controllers. The duties and responsibilities of all positions are clearly spelled out along with the requirements to hold each position. AFI 13-204 Volume 1, (2010) paragraph 4.2.5. and AFI 13-204 Volume 3, (2010) paragraph 7.1.5. identify watch supervisor requirements. These requirements are: hold at least a seven skill level, possess appropriate special experience identifier, have performed ATC duties for at least four years, and have one year in type of facility to supervise. Additionally, they must be rated in all positions and be appointed by facility chief controller. The watch supervisor is ultimately responsible for all ATC operations

during their tour of duty and according to many facility chief controllers, the most demanding and important job in ATC.

The USAF Air Traffic Control Operations Career Field Education and Training Plan (2010) lists the duties and responsibilities of USAF watch supervisors as:

> Controls enroute and terminal air traffic. Initiates and issues ATC clearances, instructions and advisories to ensure safe, orderly and expeditious flow of air traffic operating under instrument and visual flight rules. Employs air and ground communications, aural, visual and radar systems to control and expedite movement of air traffic. Releases and/or accepts aircraft to and/or from other enroute or terminal ATC facilities. Coordinates the status of other ATC facilities. Supervises ATC functions. Ensures the facility operates in a safe, efficient and professional manner. Effects coordination within the facility and between other facilities or agencies. Exercises general supervision over ATC personnel. Identifies training requirements, ensures training is conducted and certifies training. Ensures pre-duty familiarization and equipment checks are conducted and appropriate agencies are notified of equipment deficiencies. Directs actions of controllers in handling aircraft mishaps, emergencies, bomb threats, fire and similar emergency situations. Implements emergency operational plans and procedures. Performs as upgrade/qualification OJT trainer. On the job trainers for ATC management training must: be certified on tasks to be trained; possess the appropriate SEI; complete the AF Trainers Course; complete the local Trainer TCG (if applicable); complete AT-M-01 (Trainer's QTP) and be recommended by their supervisor. (p. 14-15)

Air Force Instruction 13-204 (2010) lists the Chief Controller's (CCTLR) duties as follows:

Determine the minimum number of qualified controllers required for duty based on published facility hours, services required by assigned flying units and scheduled flying activities.

Ensure that upgrade training and Special Experience Identifier (SEI) information is validated and submitted to the Unit Training Manager (UTM) for inclusion in the individual's personnel record.

Implement approved ATC procedural changes in support of the wing flying mission, FAA and host nation requirements.

Ensure all assigned controllers meet appropriate physical qualification requirements.

Document all trainer and facility watch supervisor certifications on AF IMT 3622.

Ensure controller training is implemented in accordance with the Training OI (TOI) and initiate corrective actions as necessary.

Develop a checklist to review for currency/accuracy of all items listed in paragraphs 5.7.4 and 5.7.5 and document results. Review products at a minimum annually, date and initial by the CCTLR or delegated to the appropriate personnel.

Manage the unit ATC simulation resources to ensure facility personnel maximize the use of simulation to accomplish training.

Define procedures for opening and closing facilities that operate less than 24 hours a day, 7 days a week. Include these procedures in an LOP coordinated with the ATC facility that has IFR jurisdiction.

Must ensure appropriate publications necessary to provide ATC services are available in each facility.

Coordinate with the Installation Security/Anti-Terrorism Manager to remain current of installation security tasking and posture as applicable to ensure security of controlled areas.

CCTLRs must establish procedures for personnel returning from TDY, Duty Not Involving Controlling (DNIC), and leave to receive training missed during their absences. (p.46-47)

Leadership

Many people believe leadership and management to be synonymous; however, this could not be more incorrect. Maxwell (2007) stated "leadership is about influencing people to follow, while management focuses on maintain systems and processes" (p.13-14). During her retirement speech, retired United States Navy Admiral Grace Hopper summarized the difference "You can't manage men into battle. You manage things, you lead people" (Biography- Rear Admiral Grace Murray Hopper, USN, 2011).

Former Commander of the USAF's Tactical Air Command, General W.L. Creech was quoted as saying:

> Leaders lead by example and set the tone. Above all, they do not countenance selective enforcement of standards. I know of no more ruinous path…than selective enforcement of rules and standards. Excellent leaders have very high standards and they enforce them without fear or favors (AF Pamphlet 36-224, 2011, p.214).

There are almost as many philosophies on leadership as there are leaders. Former President and Supreme Allied Commander during World War II, Dwight Eisenhower has been quoted many times on leadership, but none more telling than "Pull the string, and it will follow wherever you wish. Push it, and it will go nowhere at all." Brilliant Chinese military strategist Sun Tzu was quoted as saying "A leader leads by example not by force."

Leadership is not a destination, it is a journey, and it is ever evolving. Maxwell (1998) surmised it best, "leadership is developed daily, not in a day" (p. 47). Kouzes and Posner (2010) stated:

> The best leaders are the best learners. Leadership can be learned. It is an observable and pattern of practices and behaviors and a definitive set of skills and abilities. In order to master leadership you have to have a strong desire to excel, you have to believe strongly you can learn new skills and abilities and you have to be willing to devote yourself to continuous learning and deliberate practice. No matter how good you are, you can always get better. (p.120)

In his famous Gettysburg Address, President Lincoln stated "I am not bound to win, but I am bound to be true. I am not bound to succeed, but I am bound to live up to the light I have."

An extremely important tenant of leadership is leadership by example. According to Kouzes & Posner (2010) you either lead by example or you don't lead at all. Leadership by example is known by many other less technical terms. "Practice what you preach" and "Walk the talk" are two terms most people have heard and said before (Kouzes & Posner, 2010). Vlamis (1999) summarized leadership by example in one simple word, integrity. Integrity is the heart of leadership, "Do as I say do, not as I do", has no place in a leader's vernacular or actions. Perhaps former British Prime Minister Margret best summarized leadership: "Being in power is

like being a lady. If you have to tell people you are one, you aren't."

One of the most important predictors of unit achievement is effective leadership, and ineffective leadership often is a predictor of failure (Bennis & Nanus, 1985). The Air Force recognizes the importance of leadership training. In-residence professional military education (PME) training courses are mandated throughout an Airman's career. A prerequisite to supervise other Airmen, and be promoted to noncommissioned officer (NCO) status, is completion of Airman Leadership School (ALS). This 192 academic hour course devotes 81 hours to leadership and management at 67 worldwide campuses (Air University Catalog, 2010). This multifaceted course "develops and inspires the human dimension from an individual to an organizational level. Broad categories in this area include leadership styles, organizational leadership, functions of management, supervisory skills, mentoring, evaluation systems, diversity management, followership, teambuilding, and group dynamics" (Air University Catalog, 2010 p.116). The next level of formal training, the NCO Academy, is offered to technical sergeants and consists of 223 academic hours (Air University Catalog, 2010). Each of the nine NCO Academies provides 84 hours of leadership studies (Air University Catalog, 2010). Leadership curriculum "explores a wide range of leadership from the individual to the organization, including situational leadership, discipline, human behavior, performance management, problem solving, change, and conflict management" (Air University Catalog, 2010, p.123). The highest level of enlisted PME, the Senior NCO Academy, is a 264 academic hour course for master and senior master sergeants (Air University Catalog, 2010). This course concentrates on strategic thinking, vice operational and tactical approaches of other levels of PME.

Air Force Instruction 36-2618, The Enlisted Force Structure (2009) describes the three leadership levels: tactical expertise, operational competence, and strategic vision. The Enlisted

Force Structure states "The nature and scope of leadership challenges as well as the methods by which leadership is exercised differs based on the level of leadership and duties. These levels apply across the entire spectrum of the enlisted force structure" (p.4).

The age old question, "Can leadership be taught" has been examined many times. Vecchio (2007) states leadership can be taught, to certain degrees but not taught in other areas. Vecchio (2007) contends leaders can be taught "an appreciation of obstacles to effectiveness, awareness of different role models, greater self-awareness, and knowledge of frameworks for understanding/interpreting social influence processes" (p.65). Vecchio (2007) states situation specific behavior is not taught. Since 1802, the United States service academies have developed some of our country's most dynamic and charismatic leaders. Successful military leaders such as Eisenhower, MacArthur, Grant, Lee, Bradley, Schwarzkopf, Spaatz, and Patton all graduated from the United States Military Academy, at West Point, NY (West Point, 2012). Former United States leaders and other countries heads of state also graduated West Point including Eisenhower, Grant, President of the Confederate States of America, Jefferson Davis, former Republic of the Philippines President Fidel Ramos, Former Costa Rican President Jose Figueres, and former Nicaraguan President Anastasio Somoza Debayle (West Point, 2012). Additionally, the second man to walk on the moon, Buzz Aldrin, and 17 other astronauts graduated service academies. Finally, countless CEOs of highly successful companies laid the groundwork of their leadership principles through service academies (West Point, 2012).

Vecchio (2007) states leadership is a "universal phenomenon in humans and in many other species of animals" (p.5). In the animal kingdom, there is usually an alpha male in charge of the family and other members of the family defer to him. View any first grade class during recess, and there are always a couple of kids others gravitate toward and defer to as leaders. Neither the

animals nor the children received training in leadership, so this tends to support Vecchio's position that parts of leadership can't be taught, it's inherent.

Air traffic controllers assuming leadership positions receive extensive training in addition to the professional military education outlined earlier.

The first leadership position air traffic controllers usually hold is trainer. Trainers are responsible for planning and executing a trainee's regimen, as well as monitoring and evaluating a trainee's performance during live traffic conditions. In accordance with Air Force Instruction 13-204V3 (2010) the minimum qualifications to become a trainer are as follows:

- Complete Air Force Training Course
- Complete AT-M-01 (Trainer Qualification Training Package) and local trainer qualification training package
- Must be fully certified and/or facility rated
- Must be recommended by supervisor, and appointed in writing by the unit commander

Watch supervisor is the next leadership position most controllers hold. Air Force Instruction 13-204V3 (2010) states watch supervisors are "responsible for all ATC facility operations during their shift" (p.52). The minimum requirements to hold watch supervisor qualifications are as follows:

- Hold at least a seven skill level
- Possess appropriate special experience identifier
- Have four years ATC experience, including one year in type of facility to supervise
- Must be fully certified and/or facility rated

- Complete local watch supervisor training certification guide

The final leadership position for most controllers is facility chief controller. Chief controllers are responsible for managing the overall air traffic control tower operations, and directly supervise assigned personnel (Air Force Instruction 13- 204, 2010). Air Force Instruction 13-204 (2010) defines the following minimum requirements to become a chief controller as:

- Must hold control tower operator (CTO) certification
- Must complete the chief controller portion of the Air Force Job Qualification Standard within six months of initial assignment to a chief controller position
- Must complete AT-M-05 (Chief Controller Task Certification Guide) within six months of initial assignment to a chief controller position

Situational Leadership

Today's situational leadership theory is rooted in W.J. Reddin's 3-Dimensional Management Style developed in 1967 (Vecchio, 2007). Reddin suggested leader or manager effectiveness varied according to style (Vecchio, 2007). In 1969, Paul Hersey and Ken Blanchard developed a leadership model known as Life Cycle Theory of Leadership (Vecchio, 2007). The life cycle theory examined degrees of task and relationship orientations in conjunction to follower's developmental levels (Vecchio, 2007). The theory was later renamed to its more common name, situational leadership and in layman's terms can be thought of just like the title of chapter two of Leadership and the One Minute Manager "Different strokes for different folks" (Blanchard, Zigarmi, & Zigarmi, 1985). No single approach is bad, but no single approach works with every person or every occasion either.

Situational leadership combines directive and supportive behavior to form a leadership style. Directive behavior consists of telling people what to do, when to do it, how to do it, and then closely monitoring their performance (Blanchard, et al., 1985). Supportive behavior consists of listening to, supporting and encouraging people (Blanchard, et al.). The supportive leader then involves them in the decision making process (Blanchard, et al.). Figure 1 illustrates each of the quadrants of the situational leadership theory: directing, coaching, supporting, and delegating. No single style is ever all inclusive, hence the theory's name, situational leadership.

Directing or style 1 (S1) is considered high directive and low supportive leadership. This style is most appropriate with time critical tasks where leaders do not have time for supportive behavior (Blanchard, et al. 1985). Directive leaders provide specific direction and closely monitor task accomplishment (AFPAM 36-2241, 2011). In air traffic control, this is sometimes appropriate to prevent loss of required separation and immediate action is required.

Coaching or style 2 (S2) is considered high directive and high supportive leadership. This style is ideal for those who have some level of competence, but lack commitment (Blanchard, et al. 1985). Just as the style implies, think of an athletic coach. Their job is to motivate the team, teach them the system and involve them to get "buy-in" to the system to achieve the best possible results. Coaching style leaders continue "to direct and closely monitor task accomplishment but also take time to explain decisions, solicit suggestions, and support progress" (AFPAM 36-2241, 2011 p. 234).

Supporting or style 3 (S3) is a low directive and high supportive leadership. This style would be appropriate for competent but noncommittal employees. Supportive leaders "facilitate and support people's efforts toward accomplishing tasks and shares responsibility for decision making with them" (AFPAM 36-2241, 2011 p.234). An air traffic control supervisor would

apply this style when a controller understands the procedures but requires positive strokes of reinforcement to excel.

Delegating or style 4 (S4) is both low directive and low supportive. Delegating leaders turn over responsibility to the people doing the task (AFPAM 36-2241, 2011). This is used with your best workers, those who not only are capable of producing quality results, are internally driven to do so.

Directly related to leadership styles is follower development. Although it is easy to correlate follower development with leadership style, they are not automatically tied together, e.g. S1 must be applied to D1. There will be times S2 is more appropriate for a D1 follower than S1. Figure 1 illustrates the relationship between development and leadership levels (Blanchard, et al. 1985).

Development Level	Appropriate Leadership Level
D1 Low Competence High Commitment	S1 DIRECTING Structure, organize, teach and supervise
D2 Some to Low Competence Low Commitment	S2 COACHING Direct and Support
D3 Moderate to high competence .Variable Commitment	S3 SUPPORTING Praise, listen and facilitate
D4 High Competence High Commitment	S4 DELEGATING Turn over responsibility for day to day decision making

Figure 10 Development and corresponding leadership levels

Blanchard et al. (1985) identifies five steps necessary to develop commitment and competence. The steps are: tell them what to do, show them what to do, let them try, observe performance, and praise progress (Blanchard, et al.).

Situational leadership is something most people do every day without even thinking about it. Coaches and parents continuously apply the situational leadership model without giving it any thought. Take new Denver Broncos quarterback Peyton Manning for example. His study habits are legendary and he epitomizes being prepared for a game, so it would be asinine for a coach to

treat him like a young, developing rookie. Jamarcus Russell was the first player taken in the 2007 National Football League draft by the Oakland Raiders. He signed a contract worth $62 million, half of which was guaranteed regardless of performance. After signing the hefty contract, it became apparent Russell lacked the commitment to maximize his enormous potential. The Raiders, already on the hook for $31 million, praised, supported, and defended Russell for over two years before reaching the conclusion he would never change. What does this have to do with situational leadership? Everything! The situational leadership model is depicted in Figure 1. Remember, according to the situational leadership theory, leadership styles are correlated to developmental levels. The Broncos realized Manning operates from a D4, High Competence/High Commitment so a delegating leadership style from the coach would be appropriate. He requires low support and low directive behaviors. Since Russell was actually a D2, Low Competence/Low Commitment developmental level, a directing style would have been appropriate. Russell epitomized D2 and made no efforts to improve. Raider coaches started with a S3 approach with him, eventually regressing to a S1 approach before ultimately releasing the quarterback. It is doubtful, either the Broncos or Raiders coaches thought they were applying situational leadership; they were just doing what coaches do.

One similar study, a 2007 Swedish quantitative study entitled Situational Leadership in Air Traffic Control was located after an exhaustive search. According to Rickard Bergh (2012) of the Swedish Air Traffic Controllers Association, Swedish control tower personnel facilitated the safe arrival and departure of 385,000 aircraft operations in 2001. There is a huge disparity in the number of operations handled by Swedish control towers and the 3.4 million operations handled by USAF tower controllers. The nearly 9:1 ratio and nature of the study notwithstanding, the information captured in the previous study provided an interesting backdrop for this study.

Arvidsson, Johansson, Rasa, & Akselsson (2007) conducted a quantitative study consisting of 32 scenario based questions with four possible responses. Of the 635 questionnaires distributed, 308, or 49% where returned and examined. Arvidson & et al. (2007) found that in each of the four areas they examined the prevailing preferred leadership style was participating or supporting. Additionally, Arvidson & et al. (2007) noted more research is needed to study the linkage between specific leadership styles and safety-related organizational aspects and working environment air traffic control.

Chapter Summary

The purpose of Chapter 2 was to review the works of authors on leadership and air traffic control independently. The first section examined was general air traffic control. Air travel is more popular than ever, and increasing numbers of aircraft and passengers continue to crowd the skies worldwide. A small number of highly trained professionals orchestrate millions of arriving and departing aircraft annually.

Next, air traffic control in the United States Air Force was examined. Air Force controllers earn the same licensure as their Federal Aviation Administration counterparts, but have to encounter challenges unique to military personnel and environments. Small, high speed and performance aircraft blending into saturated traffic patterns with heavy aircraft conducting multiple approaches is comparable to school buses entering the Daytona Speedway during race day. Even at busiest commercial airports, aircraft conduct a single approach and taxi to the gate. At busy Air Force bases, pilots continually train to hone combat skills, so the aircraft conduct multiple approaches and a safe and effective traffic flow must be not only created, but continually tweaked do to the variety of aircraft characteristics.

The art of leadership was explored next. Leadership is a skill perfected through education and practice. In this way, leadership is no different from professional athletes, physicians, mechanics, or any other vocation which requires both knowledge and application levels to succeed. Some people seem to have the magnetic, charismatic personality that naturally draws others to them, however, without honing of leadership skills, they are merely popular not leaders.

Finally, a distinctive leadership style, situational leadership was examined. The ability to mesh a myriad of skill sets and personalities is critical for air traffic control supervisors to maintain flight safety. The more diverse the supervisor's leadership toolbox is, the better equipped they are to effectively handle any situation. An automotive mechanic would not arbitrarily use a torque wrench for every situation; an effective supervisor should not apply the same leadership style to every subordinate or situation.

CHAPTER 3

METHODS

The purpose of this qualitative study was to determine the preferred leadership style of USAF air traffic control watch supervisors in various scenarios. Creswell (2012) defined qualitative research as "an inquiry approach useful for exploring and understanding a central phenomenon" (p. 626). Gay, Mills & Airasian (1987) elaborated further stating "qualitative research is the collection, analysis, and interpretation of comprehensive narrative and visual data to gain insights into a particular phenomenon of interest" (p.7).

According to Creswell (2012), the five steps of qualitative research are: "identify participants and sites to be studied, gain access to these individuals, consider what type of information will best answer your research questions, design protocols or instruments for collecting and recording information and administer the data collection with special attention to potential ethical issues which may arise" (p. 205).

This study utilized the grounded theory of qualitative research. Creswell (2012) defined the grounded theory of research as "a systematic, qualitative procedure used to generate a theory that explains, at a broad conceptual level, a process, an action, or an interaction about a substantive topic" (p.423). Bloomberg & Volpe (2008) stated the two primary characteristics of grounded theory are the "constant comparative method of data analysis (i.e., the ongoing comparison with emerging categories) and theoretical sampling of different groups to maximize the similarities and differences of information" (p.11). Qualitative data was gathered via interviews with a chief

controller from seven of the eight major commands (MAJCOMs) which host active duty air traffic control towers. Air Force Pamphlet 36-2241 (October 2011) defines a MAJCOM as:

> A MAJCOM represents a major Air Force subdivision having a specific portion of the Air Force mission. Each MAJCOM is directly subordinate to HQ USAF. MAJCOMs are interrelated and complementary, providing offensive, defensive, and support elements. An operational command consists (in whole or in part) of strategic, tactical, space, or defense forces, or of flying forces that directly support such forces. A support command may provide supplies, weapon systems, support systems, operational support equipment, combat materiel, maintenance, surface transportation, education and training, or special services and other supported organizations. (p. 59)

Step two was to gain access to the individuals. Since each MAJCOM has unique mission requirements, it was essential to interview a representative from each to ensure each mission, level of complexity and aircraft were adequately represented. The Air Force air traffic control functional manager granted approval to conduct voluntary interviews. The functional manager notified MAJCOM functional managers affirming his support paving the way for the research.

The final three steps of the process were merged together. The information necessary to answer the research questions was incorporated in the interview protocol (Appendix A). Each protocol was maintained with the recording of the interview, and interviewees are only identified as Chief Controller 1, Chief Controller 2, etc., to ensure their autonomy.

Statement of the Problem

Air traffic control is a fast paced, extremely fluid vocation. Supervisors need to be aware of different leadership styles because no single leadership style will work in every situation. Just

as mechanics have many different tools to accomplish their duties, air traffic control supervisors must stock their leadership toolbox with tools appropriate to handle a given situation.

Research Questions

This study examined the leadership styles utilized in United States Air Force air traffic control towers. The following research questions were used to guide this study:

1. What leadership style does a watch supervisor employ during normal operations when a fully certified controller is in position?

2. What leadership style does a watch supervisor employ during emergency or complex operations when a fully certified controller is in position?

3. What leadership style does a watch supervisor employ during normal operations when an apprentice controller is in position?

4. What leadership style does a watch supervisor employ during emergency or complex operations when an apprentice controller is in position?

Purpose of the Study

This study provided United States Air Force air traffic control chief controllers a snapshot of the preferred method their peers worldwide handle given situations. Armed with this knowledge, supervisors are better able to identify both appropriate and inappropriate leadership styles.

Limitations of the Study

This study relied on participation of experienced air traffic control chief controllers through structured interviews. It was important to conduct structured interviews instead of unstructured to ensure all interviewees were asked the same questions to compare against the expert panel's answers.

Leadership style is very subjective and how several supervisors handle identical situations will inevitably vary.

Population of Study

The population for this study was chief controllers from seven of the eight USAF MAJCOMs. In qualitative research the focus is in depth on relatively small samples. Patton stated small samples vary and can even be single cases (as cited by Loffi, 2012, p.69). Patton further stated, "I recommend that qualitative sampling designs specify minimum samples based on expected reasonable coverage of the phenomenon given the purpose of the study and stakeholder interest" (as cited by Loffi, 2012, p.69). The MAJCOMs consisted of Air Combat Command (ACC), Air Mobility Command (AMC), Pacific Air Forces (PACAF), U.S. Air Forces in Europe (USAFE), Air Education and Training Command (AETC), Air Force Materiel Command (AFMC), Air Force Global Strike Command (AFGSC) and Air Force Space Command (AFSPC). Although MAJCOM was defined earlier, it is essential to understand the difference in each MAJCOM. Each MAJCOM's mission is defined in AFPAM 36-2241.

ACC's mission is to provide combat airpower to America's war fighting commanders. This includes fighter, bomber, reconnaissance, battle management, and electronic warfare aircraft stationed within the continental United States (AFPAM 36-2241, 2011).

Air Force Pamphlet 36-2241 (2011) defines AMC's primary mission is "rapid, global mobility and sustainment for America's armed forces" (p.59). AMC employs both cargo aircraft such as the C-17 and C-5 as well as aerial refueling aircraft.

Air Force Pamphlet 36-2241 (2011) states PACAF's mission is to provide "ready airspace and information power to promote U.S. interests in the Asia-Pacific region during peacetime,

through crisis and in war" (p.60). There are approximately 340 fighter and attack aircraft assigned to PACAF (AFPAM 36-2241, 2011).

USAFE directs air operations spanning three continents as the air component of the United States European Command (AFPAM 36-2241, 2011). Air Force Pamphlet 36-2241 (2011) states approximately 220 fighter, attack, tanker, transport and rotary wing aircraft provide USAFE the ability to provide "close air support, air interdiction, air defense, in-flight refueling, long range transport, and support of maritime operations for North Atlantic Treaty Organization signatories" (p.61).

AETC utilizes approximately 1,500 aircraft to provide military, technical, and flight training as well as professional military training for America's Airmen (AFPAM 36-2241, 2011).

Air Force Pamphlet 36-2241 defines AFMC's mission as "delivers war-winning expeditionary capabilities to the warfighter through development and transition of technology, professional acquisition management, exacting test and evaluation, and world-class sustainment of all Air Force weapon systems" (p.62).

AFGSC is the Air Force's newest MAJCOM and is responsible for the county's three intercontinental ballistic missile wings, and three bomber wings (AFPAM 36-2241, 2011).

AFSPC provides cyberspace and space capabilities as well as manages the Air Force's pool of deployable air traffic control and landing systems (AFPAM 36-2241, 2011). Additionally, AFSPC maintains a cadre of air traffic controllers whose mission is to provide air traffic control services in worldwide forward operating locations within 24 hours of notification.

Each MAJCOM has an average of 5.75 control towers.

Sample of the Population

This study utilized purposeful sampling. Purposeful sampling is defined as "a qualitative sampling procedure in which researchers intentionally select individuals and sites to learn or understand the central phenomenon" (Creswell, 2012, p. 626). Technical experts, USAF air traffic control chief controllers were interviewed and asked each research question. Rubin and Rubin (2012) stated:

> Technical experts usually enjoy talking about their fields. Technical experts are more likely to spend time talking to you if they recognize that you have done your homework, that you are not ignorant, and that what you are asking about is not generally known. (p.176)

A total of 18 requests for interviews were distributed, and eight agreed to participate in the study. Originally, one chief controller from each major command was scheduled to be interviewed but the decision was made to exclude Air Force Space Command from the study based on the fact there are only two bases with operational control towers, and they are both exclusively staffed by civilian air traffic controllers. Since two of the research questions involve situational leadership techniques involving apprentice controllers, and Air Force Space Command does not train apprentice controllers, a chief controller from another major command with an extremely complex traffic flow was selected to participate in the study. All 18 chief controllers who were sent an invitation to participate in the study were recommended by respected members of USAF air traffic control senior leadership. Each chief controller interviewed with exception of Chief Controller 8 was the first chief controller from their MAJCOM to volunteer to participate in the study. The additional chief controller interviewed was from Air Combat Command. The rationale for this selection was twofold: a) the chief

controller is highly respected within the air traffic community, and b) the unique flying mission of the facility he oversees, and its impact on operations.

Seidman (2006) stated there is no prescribed number of participants, however there are two criteria to determine if the number of participants is adequate. According to Seidman (2006) the criteria is sufficiency and saturation of information.

Seidman (2006) defined sufficiency as "was the number of persons interviewed sufficient to reflect the range of participants and sites that make up the population so that others outside the sample might have a chance to connect to those in it" (p.55).

The second criterion according to Seidman is saturation of information. Saturation simply put is when the researcher no longer receives new information, and is learning nothing new (Seidman, 2006).

Instrumentation for Data Collection

This research study utilized semi structured interviews as the primary means of data collection. Kerlinger (1986) states interviews can be used for three main purposes:

> Exploratory device to help identify variables and relations, to suggest hypotheses, and to guide other phases of the research. Two, it can be the main instrument of the research. In this case questions designed to measure the variables of the research will be included in the interview schedule. These questions are then to be considered as items in a measurement instrument, rather than mere information gathering devices. Three, the interview can supplement other methods: follow up unexpected results, validate other methods, and go deeper into the motivations of respondents and their reasons for responding as they do (p. 440). Rubin and Rubin (2012) stated "in semi structured interviews, the researchers has a

specific topic, prepares to learn about, prepares a limited number of questions in advance, and plans to ask follow up questions" (p.31). Berg (2007) listed the characteristics of semi standardized interviews as:

- More or less structured
- Questions may be rendered during the interviews
- Wording of questions flexible
- Level of language may be adjusted
- Interviewer may answer questions and make clarifications
- Interviewer may add or delete probes to interview between subsequent subjects

A 25 question, multiple choice questionnaire was developed solely for the purpose of this study and administered to the panel of 10 experts (Appendix B). Each research question was equally referenced in the instrument. Questions are scenario based, and pose the same question, "What leadership style would you use?" Instrument questions 2, 5, 6, 10, 14, 19, and 22 related to research question one. Research question two was covered by Instrument questions 3, 7, 8, 9, 15, and 20. Instrument questions 13, 16, 18, 23, 24, and 25 address researches question three. The final research question was addressed by Instrument questions 1, 4, 11, 12, 17, and 21.

A total of 16 questions were asked via the structured interviews (Appendix A). Each open ended question directly supported one of the main four research questions. Vast geographical distances necessitated telephonic interviews. Each interview was conducted using the recorded communications console at Tinker Air Force Base's control tower. The interview was then downloaded to an external hard drive for later transcription.

Validation of the Instrument

Creswell (2012) defined validity as:

> The development of sound evidence to demonstrate that the intended test interpretation (of the concept or construct that the test is assume to measure) matches the proposed purpose of the text. This evidence is based on test content, responses processes, internal structure, relations to other variables, and the consequences of testing (p.630).

Creswell (2012) defined reliability as:

> Means that individual scores from an instrument should be nearly the same or stable on repeated administrations of the instrument and they should be free from sources of measurement error and consistent.

Implementing Creswell's previously mentioned steps; a panel of 10 experts was selected and asked to participate in the study to establish a preferred leadership style baseline. Each willingly provided their feedback to the 25 question questionnaire (Appendix B). Each respondent was asked to rank the choices for each question from best to worst choice. Although leadership style is an individual decision, questionnaire answers were weighted from best to worse choice. Based on the mean of the expert's choices, the following weights were assigned to each choice: the best choice +2, second best choice +1, third best choice -1, and fourth best choice -2. This data was later compared to the responses received from the chief controller interviews, to establish a preferred leadership style baseline. Instead of merely selecting the choice they felt to be the most correct answer, the subject matter experts were asked to individually rank each leadership style from best to worst choice (Appendix B). The experts selected to validate this study, averaged 25.6 years of experience and were facility rated in 6.9 control towers, and their rankings for each question are listed in Appendix C.

Questions were grouped into clusters based on their relationship to the study's research questions. The mean of the experts' responses was used to determine the best response to each question before it was submitted to study sample.

Additionally, all subject matter experts were given the opportunity to provide feedback for revisions or inclusion of scenarios and/or questions, however, there were no comments or suggestions received.

Method for the Collection of Data

The Oklahoma State University (OSU) Institutional Review Board's Application for Review of Human Subjects Research was completed prior to conducting any research in accordance with university policy. Permission to conduct this research study was approved by the OSU Institutional Review Board (IRB Application number: ED1296). According to OSU Institutional Review Board "all research involving human subjects conducted by faculty, students, or staff of OSU shall be submitted to the OSU Institutional Review Board for review before the research is initiated" (Oklahoma State University Instutional Review Board, 2008). The participants in this study were completely anonymous; only identified as Chief Controller 1, or Expert 1 etc. The standard Oklahoma State University participant information sheet (Appendix D) was emailed to each interviewee several days prior to their scheduled interview and electronically returned to the researcher. No interviews were conducted until the informed consent letter was signed and returned.

Participants voluntarily participated in this study. All recorded and printed materials were maintained exclusively by the researcher. Electronic media was maintained in a password protected file on a dedicated media source available only to the researcher.

Analysis of Data

Data analysis consisted of clustering the expert's responses to each of the 25 questionnaire questions to support the four research questions and developing total scores across an item cluster. Gay et al., (1987) stated "developing and analyzing clusters of items related to the same issue make a report's more meaningful, it also improves the reliability of the scores themselves- in general, the more items, the higher the reliability" (p.185).

According to Creswell (2012), analyzing and interpreting qualitative data consists of six steps: " preparing and organizing the data for analysis, engaging in an initial exploration of the data through the process of coding it, using the codes to develop a more general picture of the data—descriptions and themes, representing the findings through narratives and visuals, making an interpretation of the meaning of the results by reflecting personally on the impact of the findings and on the literature that might inform the findings, and conducting strategies to validate the accuracy of the findings" (p. 237).

Figure 11 below depicts Creswell's visual model of the coding process for qualitative research (Creswell, 2012, p. 244).

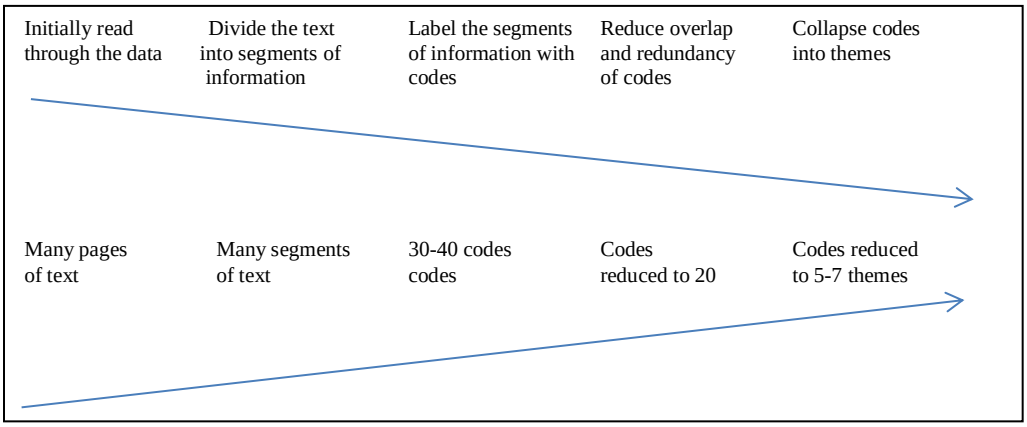

Figure 11 Creswell's visual model of the coding process in qualitative research

Creswell acknowledged there is no definite procedure; however this outline of the process should serve as a roadmap for most studies.

Overview of the Interview Process

Kvale and Brinkmann (2008) stated "the qualitative research interview attempts to understand the world from the subject's point of view, to unfold the meaning of their experiences, to uncover their lived world prior to scientific explanations" (p.1). This study consisted of semi structured one on one telephonic interviews with United States Air Force air traffic control tower chief controllers representing each major command. Creswell (2012) stated "one on one interviews are ideal for participants who are not hesitant to speak, are articulate, and can share ideas comfortably" (p.218). The interviews were considered semi structured because a specific list of questions was asked by the researcher.

All interviews were recorded via the Digital Voice Recorder system contained in the Tinker Air Force Base air traffic control tower. According to the Federal Communications Commission's Recording Telephone Conversations (2012) interstate and international conversations cannot be recorded unless the recording device is:

> preceded by verbal or written consent of all parties to the telephone conversation; preceded by verbal notification that is recorded at the beginning, and as part of the call, by the recording party; or accompanied by an automatic tone warning device, sometimes called a "beep tone," that automatically produces a distinct signal that is repeated at regular intervals during the course of the telephone conversation when the recording device is in use.

Gay et al., (1987) identified three basic choices for collecting interview data: taking notes during the interview, writing notes after the interview and audio or videotaping the interview

(p. 420). Gay et al., (1987) continued "the data collection method of choice is audio or videotape recording which provides a verbatim account of the session" (p.420).

Each interviewee was advised and acknowledged the call was being recorded. Additionally, an audible beep tone sounded every 20 seconds of the conversation.

Transcription of interviews is a key component of preparation and organization of data. Creswell (2012) defined transcription as "the process of converting audiotape recordings or field notes into text data" (p.239). Rubin and Rubin (2012) stated "the first step in analysis to prepare a transcript contains a full and accurate word for word written rendition of the questions and answers" (p.190). The researcher personally transcribed the interviews and portions/entirety of interviews may be included in appendices. The original audio tapes will be secured in a fire proof safe for a period of one year then destroyed.

CHAPTER 4

RESEARCH FINDINGS

Chapter Introduction

The purpose of this qualitative study was to determine the via semi structured interviews, the preferred leadership styles of United States Air Force air traffic control tower watch supervisors in a given situation.

This chapter contains the findings from participant interview transcripts. The study's findings consist of 50 pages of transcribed interviews from eight USAF air traffic control chief controllers across the spectrum of major commands. Each of the chief controllers interviewed are responsible for the everyday management of an operational USAF control tower.

Outline of Research Questions

This study sought to answer the following research questions:

1. What leadership style does a watch supervisor employ during normal operations when a fully certified controller is in position?
2. What leadership style does a watch supervisor employ during emergency or complex operations when a fully certified controller is in position?
3. What leadership style does a watch supervisor employ during normal operations when an apprentice controller is in position?
4. What leadership style does a watch supervisor employ during emergency or complex operations when an apprentice controller is in position?

Each person interviewed was asked the same questions (Appendix A) and their responses were recorded for accuracy and later transcription. The researcher personally transcribed each interview.

Profiles of Participants

Chief Controller 1 has worked in seven air traffic control towers during a 19 year career. He has led operations at two control towers and his facility was selected twice as his major command's D. Ray Hardin Air Traffic Control Facility of the Year. He has amassed many individual honors as well, including his major command's enlisted air traffic control manager of the year.

He manages a USAF control tower overseas and stated his trainer and monitor core is experienced and traffic conditions at his facility are busy and very complex. His facility currently has a training load of 100% and apprentice controllers normally are fully certified in 9 to 12 months. The facility has a successful training program as evidenced by only having one apprentice controller withdrawn from training in the previous 18 months.

Chief Controller 2 has worked in eight air traffic control tower spanning his 14 year career. He has managed two air traffic control towers, and the first facility he led earned Airfield Operations Flight of the Year and the Commander in Chief's Installation Excellence Award.

He manages a control tower in the continental United States and stated his trainer and monitor core is not very experienced. He further stated that traffic volume and complexity at his facility are very low He identified a significant training challenge at his facility which in part resulted in the withdrawal of three apprentice controllers in the previous 18 months while operating at training load of 125%.

Chief Controller 3 is a 23 year veteran of United States Air Force air traffic control towers. He has been facility rated in seven control towers and has been facility manager in three of those. This chief controller manages a control tower overseas, which in terms of volume traffic is low; however conditions are very complex due to restrictions placed on traffic pattern management by the host nation. Despite juggling a 150% apprentice controller training load, his facility had zero apprentice controllers withdrawn in the previous 18 months. He considered his trainer and monitor core experience as average and apprentice controller certification time averages nine months.

Chief Controller 4 has been assigned to seven control towers during his 15 year career. He has been facility manager at four control towers, and his outstanding efforts led to his facility earning Air Field Operations Complex of the Year four times. This dynamic leader earned promotion to technical sergeant via the United States Air Force's Stripes to Exceptional performer program. According to a 2007 interview, former USAF Chief of Staff General T. Michael Mosey stated only 310 of the over 282,000 or 1.25% of the enlisted force would earn this honor.

He described his stateside facility as very low volume and low to moderate complexity. Despite being manned at 130% in qualified controllers, he considers his trainer monitor core experience level as low. He faces a challenge of a 500% increase in his apprentice controller training load and in the previous 18 months has had one withdrawn from training. Due to the lack of traffic, and its simplistic nature, it takes apprentice controllers an average of 13 months to become certified controllers.

Chief Controller 5 has been assigned to seven control towers and has led operations at three.

He manages a moderately busy stateside control tower in terms of traffic volume. He stated in terms of complexity, conditions are very simplistic. His apprentice controller training load is currently 300% and has had four controllers withdrawn from training in the previous 18 months. He believes the lack of experience in trainers and monitors was a key reason for three of the four withdrawals. Apprentice controllers average eight months to achieve full certification.

Chief Controller 6 has been assigned to nine control towers during his 15 year career. His current assignment is his second facility he has led. His leadership was essential to two major command D. Ray Hardin Air Traffic Control Facility of the Year awards.

This chief controller manages a stateside control tower staffed at 180% of certified controllers. He considers his trainer and monitor core very experienced, and despite a 900% increase in apprentice controller training, has only had two controllers withdrawn from training in the prior 18 months. He stated it takes an average of eight months for an apprentice controller to earn facility certification.

Chief Controller 7 has been fully certified in nine control towers both within the United States and abroad. He is an 18 year veteran leading his first facility. He has earned numerous personal accolades including Noncommissioned Officer of the Year three times for his squadron and many other quarterly awards. He was named an Outstanding Performer during two Air Traffic Systems Evaluation inspections.

Chief Controller 8 was selected to fill in for the Air Force Space Command. He was selected because of his extensive experience, track record of outstanding results and complexity of operations at his current facility. He has led nine USAF air traffic control towers during his 19 year career, garnering four MAJCOM level and two Air Force level D. Ray Hardin Air Traffic

Control Facility of the Year awards. His current facility has a 700% training load of apprentice controllers. He has earned numerous personnel accolades as well.

Data Collection

The data collection method used during this study was telephonic interviews. Each interview ranged from 20-40 minutes in duration. Interviews were initiated via the recorded landline in the air traffic control communications console at Tinker Air Force Base's air traffic control tower. All air traffic control communications are required to be recorded, and utilizing the digital voice recorder system used for air traffic control operations ensured higher quality recording than from a typical portable recorder. Tinker's two "Reliant" recorders, manufactured by Digital Instruments, have the capability of recording 32 separate channels. Each recorder has a built in redundancy, so in essence each conversation is recorded four times. Federal Aviation Administration and United States Air Force regulations require recorded data to be maintained for 45 days (Air Force Instruction 13- 204, 2010). After this period the data is automatically recorded over to save room on the computer's hard drive. The only recorded record of these interviews was maintained by the researcher for a period of one year and then deleted.

Response to Interview Questions

Interview question 1. This question also served as the first research question. It was designed to gauge the preferred leadership style during daily operations. The question, what leadership style does a watch supervisor employ during normal operations when a fully certified controller is in position, elicited the following responses:

Chief Controller 1 stated there really was not a preferred leadership style in his facility. His supervisors truly employ situational leadership running the gambit from directing to delegating.

> It depends just depends on the situation you know, it really does. Whether you, if you are asking whether or not the forcing, collaborating, accommodating, avoiding, compromising styles are used it really depends on the situation. Now there's forcing (directing) the watch supervisor has to force the issue if there is an aircraft conflict. You will do this now type of stuff. It works all the way down to compromising, talking about teamwork to get the job done. It also depends on how good is that fully qualified controller... (Chief Controller 1, Interview Response, November 11, 2012).

It seems without even thinking about it or being aware they are doing it, Chief Controller 1's supervisors are fully implementing situational leadership.

Chief Controller 2 replied:

> It would be like it would be a supporting style. The reason why I say that, they are still looking out and providing techniques if they need to help them grow even though they are full certified controllers but while they are maintain overall situational awareness up there in the cab (Chief Controller 2 Interview, October 11, 2012).

Chief Controller 3 stated delegating is the normal style utilized by his personnel. He stated "you trust them, they are all fully certified controllers so not a lot of supervision required."

Chief Controller 4 stated:

> Okay, I say that because a fully qualified controller needs low directive, actually, probably, more of, can I change my mind? {Laughing} Probably it could be a combo of the two but as I'm reading it a little further probably more of the delegating because it is low directive and low supportive at that point, looking at the qualified, but as he began describing the supervisors actions, asked if he could change his mind. He said the more he thought about it, his supervisors used delegating due to its low directive and low supporting nature. He further

stated that because the controllers were fully trained on the tasks, and it is normal situation, minimal supervisory involvement is required (Chief Controller 4, Interview Response, October 18, 2012).

Chief Controller 5's supervisors utilize a supporting leadership style under these conditions. He stated his supervisors felt supporting leadership enabled his controllers to handle situations on their own, build their skills and techniques while still guiding their efforts to ensure mission completion. Mission completion in this sense, meant all aircraft safely launched or recovered. Chief Controller 6 stated his controllers utilized a participating style because the supervisors worked in unison with the controllers. The supervisors are aware the controller is trained and qualified, possess the required maturity level, but still provide input when necessary. Chief Controller 7 relayed "I would definitely say that depends on the watch supervisor at the time and the controllers also working, but I would say that during most situations, it would be supporting." He reiterated he is a firm believer in situational leadership and his supervisors routinely morph from one style to another based on the circumstances.

Chief Controller 8 stated his watch supervisors prefer the delegating leadership style in this instance. His rationale was if a controller is fully rated, they have proven they can work that level of traffic. He continued by stating "Our training process and traffic are pretty complex and to get rated there is a significant thing. Obviously the newer our rated controllers are then more hands on, but for the most part our five levels that have been rated for a year or two plus watch supervisors use the delegating style."

Interview question 2. Question two, what traffic conditions, both volume and aircraft type are considered normal for your facility, was designed to define normal conditions in support of research questions #1 and #3.

Chief Controller 1 stated "volume is high, aircraft type, is, you pick them. Over my first two months here I've seen everything but…I have seen a lot of aircraft types." When asked how he defined high volume, Chief Controller 1 stated "six to eight aircraft in the pattern is normal, busy would be 10-12."

Chief Controller 2 stated:

> Well we are AETC, so we got they are for the most part they are all the same type aircraft landing on the same runway. So I would say 1-2 aircraft to the center runway and maybe 3-4 to one of the other patterns since we have a total of three patterns here (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3:

> I believe our traffic count, annual traffic count is roughly 35,000 per year. The majority of those are transient aircraft C-5, C-17, KC-135 type, C-130s, LJ's it's a Lear type jet stationed here. So generally, that's generally that's the normal mix, the majority of the traffic being transients. C-130s occasionally playing in the pattern and some army aviation occasionally. (Chief Controller 3, Interview Response, October 9, 2012).

Chief Controller 4 responded, "Normal? Normal traffic levels for us, we are pretty slow here, 18,000 ops a year, so, normal is nothing really flying around the pattern. But if they are actually working aircraft in the pattern, one or two is the norm."

Chief Controller 5 stated "Normal for us, we'll stay between four and six. We normally share the airspace with helicopters from army Felker, a couple of HH-60s but our normal traffic is T-38s and F-22s."

Chief Controller 6 stated:

We have a mix of various weights, smalls, heavies, larges, and small pulses. So on a normal basis that's what we would have, primarily military aircraft; we do get some civilian aircraft but typically I would say about maybe 80-100 ops a day about 36,000 a year is typical for us (Chief Controller 6, Interview Response, October 4, 2012).

Chief Controller 7 stated:

I would say during normal recovery I would say light to moderate and then we also have F-15 training phases and we get a lot more pattern work during those times. We have those every one and half to two months, and during those recoveries we get moderate to heavy traffic…I would say moderate is 5-7 and then I would say heavy is 8-12 aircraft (Chief Controller 7, Interview response, November 15, 2012).

Chief Controller 8 stated "For normal probably four plus aircraft in the pattern. Type of aircraft we have U-2, T-38, and MC-12s and occasionally, very occasionally the global hawk, but once they are in the pattern everything else is outside of it."

Interview question 3. Question three, in terms of complexity, how would you rate normal operations at your facility, was designed to determine how complicated operations were at their facilities. This question also directly relates to research questions #1 and #3.

Chief Controller 1 rated his operations as complex. He stated:

I would rate them complex. I mean I don't know if you have ever heard of this place WM, or heard of individuals who were stationed here but the radar function has pretty much gone away but the tower is still here and you are still with some of the same stuff you would as a radar body, Just Complex, you have dual runways, you have 18 taxiways, you got airfield construction that is always an issue around here, always trying to update this stuff. You have fighters, heavies, helos, (helicopters) light aircraft, any type of light aircraft you can think of

from 172s to Cessna Citation. Weather is always an issue here cause its always rolling in and out that's where the watch supervisor always has to be aware of that and how that is going to affect traffic patterns and the flow of aircraft. One of, another one is the foreign language barrier. Dealing with not only Japanese aircraft flying through the air, but also coordinating with Japanese controllers over the landlines sometimes can be a little bit difficult. So I would say, and then oh by the way, we have the extended runway centerlines for the main civilian airports here at Naha and Kadena I think are off by eight miles at the approach and departure ends (Chief Controller 1, Interview Response, November 11, 2012).

Chief Controller 2 stated:

In terms of complexity everybody is doing the same thing, all the same types coming to the same runway. RSUs (Runway Supervisory Units, pilot's issuing instructions) control the inside and outside runway most of the time. A lot of times we just got the center and we are just launching departures and clearing full stops. (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3 stated "I would say moderately complex due to host nation restrictions and those type of things. Mixing C-130s in with the C-5s with the restrictions we have."

Chief Controller 4 stated "complexity is somewhere between simple and moderate if you had a midway point there."

Chief Controller 5 stated:

Compared to every other base this is probably the slowest base I have ever worked at, definitely a more simple complexity. Only because the F-22s and T-38s are pretty much canned operations what they do. They go out, maybe do one or two, touch and go, or low

approaches, and then full stop. There is almost no complexity to their operations (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 stated:

Moderate to Severe complexity. Again it just depends on the mix of our heavies and smalls and what they are requesting, whether they are requesting circling approaches or practice approaches and the amount they do there (Chief Controller 6, Interview Response, October 4, 2012).

Chief Controller 7 stated:

During the day it can get busy, but I would say again moderate but not too complex…and then we also have the nighttime VFR traffic and that gets a little more complex because we have certain procedures in place that makes it a little more difficult and challenging (Chief Controller 7, Interview Response, November 15, 2012).

Chief Controller 8 responded:

Our complexity is extremely complex. We have 18 VFR patterns and multiple altitudes that go with those. Multiple reporting points. I would say our normal operations are pretty complex. Especially when you consider the aircraft characteristics of the three main players in the deal they turn into some pretty interesting patterns (Chief Controller 8, Interview Response, October 16, 2012).

Interview question 4. Question 4, what is your biggest leadership challenge for your watch supervisors, was designed to provide insight to the challenges watch supervisors face on a daily basis.

After reflecting for a moment, Chief Controller 1 offered the following answer to this question:

This is a tough one. Probably the same way here as anywhere else in the Air Force you know because the Air Force, in my opinion is promoting these guys so quick they are young. Young watch sups have to make that transition from line controller to watch sup pretty fast. And then now they are exercising authority that just yesterday they were boys with and making sure those lines aren't crossed (Chief Controller 1, Interview Response, November 11, 2012).

Chief Controller 2 stated:

> I think it is just motivating these young airman and controllers to continue to want to be a controller at a place like Vance. Where you don't really get to control traffic as much as we want to, it is pretty tough for them to come in here and all they do is control sequencing and [inaudible] airplanes. So just keeping them motivated, but not only as controllers as Airmen as well going out and supporting base wide activities as well (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3 stated "Currently, manning would be the biggest challenges. We are pretty short on manning; controllers are working basically a six and two schedule…six days on, two days off."

Chief Controller 4 stated "I would say our experience level. Our manning is 100% plus I think we are at 130% manned five levels, but everyone is home grown and the majority of them have less than one year experience."

Chief Controller 5 stated:

> The biggest leadership challenge, I would say because we have almost no experience for our watch supervisors. There are only five NCOS in the entire facility and three of the NCOs just made staff within the last two years. So our leaders hip on the desk other than the

civilians and myself have less five years of air traffic control experience. So right now they are learning to cope with supervising the people they were working side by side with or going through training with. So they really haven't developed that skill of taking charge of their friends over maintaining the supervisor responsibility of controlling what's going on in all positions, I think that is the biggest problem they are having (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 stated:

For me at this time I would say developing watch supervisor confidence in their controllers when they work and getting to that delegation level, a lot of our watch supervisors are younger ones and so they don't have as much experience in years in the career field so getting them that confidence to just trust their people and get to that delegation stage in leadership is what I say is their biggest challenge (Chief Controller 6, Interview Response, October 4, 2012).

Chief Controller 7 stated his biggest leadership challenge was not necessarily related to air traffic control. He stated:

I think the biggest challenge I have, I have a few supervisors here, and I know the old school air traffic mentality I think was that air traffic control is all that matters the other responsibilities of being an Airman don't matter as much and I think most of my NCOS have the right mentality, that air traffic control is important but it's not all we do, there is stuff such as bettering yourself through education, getting involved in the organization, stuff like that. Stuff that is important to the air force to become a whole Airman. I think they are trying to send that message, but still there is a pressure from a few supervisors that that is

not important and I think getting the right message to our Airman is harder to do with the older school mentality (Chief Controller 7, Interview Response, November 15, 2012).

Chief Controller 8 replied:

Honestly I think it is the training program right now. As you know as the assistant chief controller at Tinker, the schoolhouse keeps giving you everybody and their brother and there is no quality control on the school house. We are getting people with no chance they are going to make it. So with the reduced flying hour program, my supervisors, especially my crew bosses are responsible for making sure the rated controllers are still proficient and still get those trainees that time to develop their skills, Its hard with that decreased flying hour program to get that quality training while trying to keep your controller work force proficient (Chief Controller 8, Interview Response, October 16, 2012).

Interview question 5. Question 5, what leadership style does a watch supervisor employ during emergency or complex operations when a fully certified controller is in position, was designed to determine the leadership style used during the most intense periods of traffic.

Chief Controller 1 initially stated his watch supervisors utilized directing approach since it was an emergency or complex and attention to detail is more critical than ever. Subsequently he recanted and selected coaching because the supervisors act as team members to assist the controllers through the situation.

Chief Controller 2 offered:

I still think they are in a supporting role unless the situation escalates to a point that it needs to go to the next level then they may become more directive if they need to make sure the situation gets handled the way it needs to be handled (Chief Controller 2, Interview Response October 11, 2012).

Chief Controller 3 also stated his personnel utilized supporting leadership because even though the controller is fully certified, he/she may require reassurance or confirmation they are making the right decisions.

Chief Controller 4 also stated his watch supervisors preferred the supporting leadership style in this situation. The fully certified controller is competently trained and confident in their abilities, however the supervisors provide back up, or an extra set of eyes to help the controller handle everything occurring.

Chief Controller 5 stated his personnel normally utilized coaching leadership styles during emergency or complex operations. He stated the supervisors help the controllers reach the correct course of action by guiding their actions by stating "Ah, I don't think that is going to work" or "Let's try and go this way, I see this as a better way of handling it."

Chief Controller 6 stated his supervisors relied on a delegating leadership style during emergency or complex operations because they don't have time to get involved "in the weeds of things" and must trust that their controllers know what they are doing. When further questioned he recanted slightly stating "Of course if the controller is struggling or providing poor service the supervisor is ready to step in."

Chief Controller 7 stated emphatically stated his watch supervisors use the supporting leadership style offering suggestions as necessary but ever ready to move into directive if the situation dictates. He reiterated that this is of course based on the controller's experience and expertise. As in any other job, one can be fully certified and operate at different levels of experience than others, but for the most part, once a controller is certified, they have been trained on emergency procedures and have probably faced complex conditions before. He was however,

adamant, that if needed the supervisors have no problem utilizing the coaching or directing role to ensure flight safety.

Chief Controller 8 stated during this situation, his supervisors are basically split 50/50 between supporting and coaching. He stated a lot of it depended on who the rated controller was and how complex the situation had become.

Interview question 6. Question 6, what are some of the most common emergency situations at your facility, was designed to determine what situations watch supervisors and controllers at their facility endure.

Chief Controller 1 stated hydraulic failures and gear problems were the most common emergency situations at his facility.

Chief Controller 2 replied "gear malfunctions, bird strikes, we got hydraulic problems. Those are probably three most common here at Vance."

Chief Controller 3 stated "generally landing gear and engine problems."

Chief Controller 4 stated "hydraulic failure is probably one of the most common, smoke in the cockpit I have seen quite a bit, but probably hydraulics is the biggest one."

Chief Controller 5 offered:

> With the F-22 definitively physiological problems with pilots, lack of oxygen and stuff like that, that's definitely been a big factor around here. But besides that, engine failure, between the F-22 and T-38 I think engine shut down is the largest problem (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 stated "Mainly engine malfunctions, engine out, we do get some hot brakes occasionally."

Chief Controller 7 stated "engine malfunctions, bird strikes, hung gun, instrument malfunctions, and stuff of that nature."

Chief Controller 8 responded "Pretty much like anything else, landing gear issues on the MC-12, T-38s have some engine issues, U2s aren't too bad, they have had, oh here would be one, decompression sickness."

Interview question 7. Question 7, what are some of the intricacies that increases the traffic complexity in your facility, was designed to provide insight to operational issues unique to a specific location.

Chief Controller 1 stated:

> Like I alluded to earlier, different air frames. Different airframes make the job a heck of a lot more difficult. Talk about different speeds on final, different speeds in the pattern. Wake turbulence separation instead of none, and reduced runway separation being different all over the place. The second would probably be the language barrier. Not just communicating with the aircraft in the air, but also with the controllers intrafacility. And probably the third thing if I had to choose three would be the runway corridors. The approach and departure ends of the runway conflict, they intersect about eight miles off departure or approach end (Chief Controller 1, Interview Response, November 11, 2012).

Chief Controller 2's reply was:

> The fact that we are not really proficient at pattern traffic. We sit here and work the center runway and don't get the patterns very often and when we do get them we are not as proficient as we should be because we haven't gotten the traffic what we are supposed to be doing… meaning we are clearing aircraft to land and clearing them for takeoff but are not

actually getting to work 3, 4, 5, 6 airplanes flying around in circles to the runway where we get to actually sequence them. (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3 responded:

I think I mentioned it before, the host nation restrictions. At Ramstein, the patterns are, the aircraft in the VFR pattern are not allowed to overfly villages in our airspace so it makes adjusting patterns difficult. The downwind pattern is not a standard downwind pattern it is more of a hoof shaped pattern that's because it needs to avoid two villages off departure end. That is the main problem we have at the base, host nation restrictions (Chief Controller 3, Interview Response, October 9, 2012).

Chief Controller 4 offered:

We have one side of our airspace is kinda "D" shaped where we butt up against Tampa. So lack of airspace and certain requests like a circling approach definitely increases the complexity. An emergency will definitely throw something in the mix like that. Being on the water, we have a lot of Coast Guard operations around the area that deal with a lot of lost boaters and swimmers and stuff like that. The area where we are at is kind of on a peninsula juts out kind of between downtown Tampa where the hospital is and St. Pete, through that thoroughfare we get a lot of medevac cutting through the airspace (Chief Controller 4, Interview Response, October 18, 2018).

Chief Controller 5 stated:

Right now I'd say it is our, amount of trainees we have. We have 54 controllers in the tower of which 23 are trainees. It is very hard to maintain proficiency levels for normal controllers with very low periods of flying but so many trainees in position to get that good training our primary controllers and trainers are lacking in their proficiency skills and not picking up the

necessary traffic to build on their own skills, but giving all the attention to the trainees. Our traffic does not support both training and proficiency. (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 stated:

We have the intersecting runways where the runways are crossing. That would normally not be a problem, but with the heavies we have that are mixed in we have to apply the separation at that intersection and we have to apply a two minute interval when you have aircraft actually moving in the air (Chief Controller 6, Interview Response, October 4, 2012).

Chief Controller 7 responded:

We talked about the F-15 training phases. We also get exercises here periodically; we just had an exercise Razor Talon we had some F-22 and T-38s come in. And also in September we did the displaced landing threshold and we will be doing that again during our ACI and that makes it a little more interesting (Chief Controller 7, Interview Response, November 15, 2012).

Chief Controller 8 responded:

When we have all three airframes in the pattern like I said you have 18 VFR patterns and when you have all three airframes in there because of the flight characteristics, T-38s are fast movers, U-2s are slower than death and MC-12 are kind of between both of those. So mixing those airframes at once in the traffic pattern definitely makes it complex.

Interview question 8. Question 8, how often do traffic conditions become complex at your facility, was designed to determine if the complexity previously described occurred continuously or only in spurts.

Chief Controller 1 stated "I would say daily complex because you also have to think about dropping, raising cables numerous times for 12 different airframes that some want it and some don't, and some have priority over the other."

Chief Controller 2 stated "traffic is very rarely complex here due to the training environment of the pilots."

Chief Controller 3 replied "Maybe twice a week at the most."

Chief Controller 4 stated "once per week for about half an hour."

Chief Controller 5 answered "I would say, once maybe twice a day for now more than 15-20 minutes at a time."

Chief Controller 6 stated:

> Quite often actually. What we have are these brief periods of complex traffic for about twenty minutes to an hour or two hours depending on circumstances and time of day or shift but they often go from simple to complex in moments (Chief Controller 6, Interview Response, October 4, 2012).

Chief Controller 7 stated "I would say about a half hour for each recovery. And then again if we have a training phase going on, I would say a daily basis if we have a training phase going on."

Chief Controller 8 replied "I would say probably three or four times a week we reach out max complexity and three for four times a day we get pretty close to it."

Interview question 9. Question 9, what leadership style does a watch supervisor employ during normal operations when an apprentice controller is in position, doubled as research question #3 and was designed to show how much more attentive supervisors are while apprentice controllers are in position.

Chief Controller 1 stated that apprentice controller's monitor is the first line of defense and the supervisor could employ any of the four styles based on the competency of the monitor.

Chief Controller 2 stated:

> For the most part I would say it is the coaching type style to help give them what they need to become rated controllers however again they might go to more of a directive style if they need to, to make sure aircraft don't run into each other or something like that (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3 stated his supervisors utilized the coaching leadership still as well. He said "it is the supervisor's duty to "Train'em up" to get them fully certified."

Chief Controller 4 agreed with Chief Controller1 saying his watch supervisors rely on the apprentice controller's monitor to provide the coaching and support, so the supervisor's role would be delegating.

Chief Controller 5 stated supporting is the preferred method in his facility both for the trainee and their monitor. Supervisors give monitors the autonomy to provide quality training without stepping on their toes. He feels this not only helps the apprentice controller grow into a fully certified controller, but builds up the monitor in the trainee's eyes.

Chief Controller 6 said the coaching leadership style is the preferred method in this instance in his facility. The watch supervisor acts as the subject matter expert and operates in unison with the trainer to provide information and direction to help the trainee grow into a fully qualified controller.

Chief Controller 7's supervisors employ coaching or directing leadership styles under these circumstances. It is the supervisor's responsibility to balance the best air traffic control service

available to pilots with trainees needs to be able to see situations, and develop a plan of action that will ensure safety while meeting as many of the pilots requests as possible.

Chief Controller 8 emphatically stated his supervisors utilize coaching leadership during this situation because they provide the guidance and discipline to the trainee. They let the trainer do their job but still provide that leadership and that presence there if they are missing any component or if their situational awareness begins to wane.

Interview question 10. Question 10, what is your current training load (apprentice controller) and how does that compare to the number you are authorized, was designed to identify additional leadership challenges supervisors face on a daily basis.

Chief Controller 1 stated "We are authorized three, and we have three. We are maxed out on three levels." He continued, "Now saying that, in my opinion this place may not be the best place to send three levels to learn." When asked to elaborate on why, he stated due to the complex nature of the traffic and fact unaccompanied Airman are usually only there for 24 months, and it takes approximately 12 months to achieve their CTO.

Chief Controller 2 responded:

> We have actually got five three level right now with two inbound by the end of October. Since three levels don't count against our manning until they are rated I don't know what we are actually authorized for three levels. (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3 stated "I think on the books we are authorized four but we currently have six trainees."

Chief Controller 4 stated "We are authorized three and I am currently sitting at 15, so that's a 500% training load."

Chief Controller 5 stated "We have 26 three levels, and are authorized nine, so 300%."

Chief Controller 6 stated:

That is a good question. I currently have I believe six trainees and have three more inbound in the next few months so we are anticipating an increase in our training load. Number authorized is one, so we will be operating at 900% capacity (Chief Controller 6, Interview Response, October 4, 2012).

Chief Controller 7 stated "We are authorized two apprentice controllers and we have ten so we have 500% training workload. We have a logjam in local control."

Chief Controller 8 replied they are at 200% capacity. "Right now we have 14 apprentice controllers and we are authorized 7 we have three more coming down the pipe. A year and half ago we had 20 three levels in the tower."

Interview question 11. Question 11, how long does it take an apprentice controller to gain a CTO in your facility, was designed to partially measure the effectiveness of air traffic control watch supervisors in getting apprentice controllers upgraded.

Chief Controller 1 stated "I would say almost 12 months."

Chief Controller 2 stated apprentice controllers takes "9 to 12 months to get checked out."

Chief Controller 3 responded "probably about nine months I would think would be an average."

Chief Controller 4 responded "I would say 12-14 months probably on average."

Chief Controller 5 elaborated:

I would say about eight months. Give or take the low traffic period, the back log in local. Most of our apprentice controllers go through flight data and ground very fast then get into

local and everyone is backlogged there (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 answered "Anywhere from six months to ten months or twelve months depending on the trainee and how much time they need."

Chief Controller 7 stated it takes approximately one year for apprentice controllers to become certified.

Chief Controller 8 replied "We just changed our block standards for local so it is taking a little more time; it was about 9 months, now it is 10 and half to eleven months."

Interview question 12. Question 12, in the last 18 months, how many if any apprentice controllers have been withdrawn, and if applicable, what was the most common reason for withdrawal, was designed to validate facility training programs.

Chief Controller 1 stated his facility lost one apprentice controller in training. He further explained:

> Okay, like I said, the one controller is going through the withdrawal package right now for a three level and it's weird on this one, because this guy had his CTO from the civilian sector prior to coming into the Air Force. So he had gotten checked out and tried to get into the FAA could not, and came into the Air Force to be an air traffic controller and is going through the withdrawal package right now. Couldn't handle the helicopters, and couldn't handle more than five aircraft especially because of how fast them moved. That was the big thing with him. I think going from the civilian sector where they don't move as fast to handling fighters that had something to do with it. The kid was a great kid, I mean is a great kid, probably had more book knowledge than 75% of the five levels here, even or seven

levels, but he would freeze up when there were more than 4-5 aircraft (Chief Controller 1, Interview Response, November 11, 2012).

Chief Controller 2's response:

We have had three of that I know in the last 18 months. I haven't been here for a full 18 months, I have been here for about nine now I guess. Since I have been here there have been three that were withdrawal for failure to obtain a rating. For the most part it is practical application. There could have been a knowledge delinquency there as well, however, my experience is most people can obtain the knowledge; they just can't apply it (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3 stated his facility only began receiving apprentice controllers 18 months ago. However in that time he stated, "I don't believe we had any."

Chief Controller 4 stated:

We have not had any, withdrawals; we had two that were on the cusps of withdrawal in the last 18 months but then they went other routes. One was discharged due to admin, disciplinary type stuff. We did have one I'm sorry I thought she went the medical route but yeah we had one in the 18 months. The reason was just failure to progress in local control. She made it through data, and struggled a bit in ground control and then got to local control and just couldn't progress at that point. She could pass any test you put in front of her, but it was the application of sequencing and wake turbulence, and all that, she couldn't sort it out, just couldn't see three dimensionally in the pattern (Chief Controller 4, Interview Response, October 18, 2013).

Chief Controller 5 stated:

We have had four in the past 18 months. Three of the four were failure to obtain in local.

They were unable to, One was unable to pass a written block test in local control, Another one was failing to maintain situational awareness well two of them, the other two were situational awareness while in local control during their training time, not being able to actually meet certification requirements before they put them up. So they were removed. The other one, the fourth one was due to behavioral issues and was removed from the career field (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 responded:

Well I have only been here at this facility for nine months but I believe there were some in the past 18 months, I'm just not aware of the time frame for them. I currently have one that is potentially going to be withdrawal. From what I have seen the most common reason for withdrawals is the failure to progress through training to overcome the obstacles in their training (Chief Controller 6, Interview Response, October 17, 2012).

Chief Controller 7 replied "Five and failure to obtain." He further expanded "They just couldn't cut it in air traffic control live. It was mostly situational awareness is what we would write them up for. They had trouble maintaining situational awareness the most important thing that could jeopardize safety" (Chief Controller 7, Interview Response, November 15, 2012).

Chief Controller 8 stated:

I have only been here for 12 months, so I can only speak to that, but since I have been there we have washed out nine and I think there were three or four in the process prior to my arrival so that is what 13 (Chief Controller 8, Interview Response, October 16, 2012)?

Interview question 13. Question 13, doubled as research question #4. What leadership style does a watch supervisor employ during emergency or complex operations when an

apprentice controller is in position was designed to determine the preferred leadership style during arguably the most stressful situations in the tower cab.

Chief Controller 1 stated apprentice controllers are not allowed to work emergency aircraft. He stated during complex operations it was dependent upon the experience of the apprentice controller and monitor as to which leadership style the supervisor would use. He stated it could be any of the leadership styles or a combination of two.

Chief Controller 2 stated his supervisors utilize supportive leadership during this scenario because the apprentice controller has a monitor who is responsible for the position. The monitor will be utilizing a more directive or coaching style, but the supervisor provides support in the event intervention is required.

Chief Controller 3 stated directive leadership is the prudent style in this scenario. The very nature of emergencies require immediate, accurate instructions be delivered, and apprentice controllers are simply not equipped to handle this workload.

Chief Controller 4 stated everyone sort of slides one style during these operations. The supervisor takes on a more supporting style while the monitor moves from a coaching style to directing style so the trainee is able to be exposed to complex traffic without degradation of service.

Chief Controller 5 stated in facility it was really split along two lines. First, the more experienced, civilian supervisors immediately resort to a directive style so things are done sequentially, and accurately ensuring no short cuts are taken where the apprentice controller learns bad habits. Some of his less seasoned supervisors remain in a delegating to supporting style letting the apprentice controller get fully exposed to all aspects of the emergency or

complex condition. He stated for the record he prefers the supervisors to take a more directive approach.

Chief Controller 6 agreed wholeheartedly that directive leadership is the preferred style in his facility. Supervisors take a more "do this or do that" role during complex operations. He reiterated that trainees are not allowed to work emergency aircraft unless being formally evaluated for position certification.

Chief Controller 7 admitted that although the best approach may be coaching in this instance, usually, supervisors immediately go into a directing role, since time is critical and it is essential to convey accurate and concise instructions. He stated his supervisors normally conduct a thorough debriefing with the controller when the situation "settles down." This enables the trainee to ask why certain things were either done or not done, and allows for them to grow professionally even though the situation was beyond their current ability.

Chief Controller 8 provided his most direct answer to this question. He said this requires only a one word answer, Directing. He explained that apprentice controllers have a very finite set of skills and usually only know of one way to handle situations. Just as a mechanic or carpenter will use a variety of tools to fix or build a project, controllers should use different tools to handle unique situations, and apprentice controllers simply have not developed a full toolbox yet.

Interview question 14. Question 14, are there any restrictions or special precautions taken at your facility when apprentice controllers are working live traffic, particularly during complex operations, was designed to determine if leadership made special concessions to assist apprentice controllers during complex operations.

Chief Controller 1 succinctly answered "Negative, in my opinion that would be, chief controllers shouldn't restrict their watch supervisors."

Chief Controller 2 stated:

> I wouldn't say there are really any major precautions, we leave it up to the trainer, monitor, or watch sup to determine if they can handle it and leave them in there if they can, because they are going to have to work that one day.

Chief Controller 3 stated "generally its normal operations any time, obviously everybody in the facility has more of a team concept everybody is monitoring what is going on in the pattern so really no, just a more heads up from everyone."

Chief Controller 4 stated "No, we don't have anything."

Chief Controller 5 stated:

> We definitely have it so that there is always a coordinator position manned by a certified controller anytime there is moderate to complex traffic and there is a trainee in local. It usually helps out with situational awareness with the monitor and local control position (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 replied:

> Absolutely, one of the biggest things is there is of course a monitor in place behind them. They always have someone listening to them and ensuring what they are saying is correct. In addition, we have a separate position from the local control position if they are working live traffic which we open called coordinator. The coordinator is there as an assist to the trainee during those complex periods (Chief Controller 6, Interview Response, October 4, 2012).

Chief Controller 7 emphatically related:

No, we don't base opening coordinator on whether we have a trainee in position or not. I think. We don't have a mandatory rule for that; we might be more likely to open it up to help them focus on the traffic instead of doing the coordination themselves but we don't have a requirement (Chief Controller 7, Interview Response, November 15, 2012).

Chief Controller 8 stated:

No we want them to see traffic as it is. If we put any kinds of controls on it they may not get to see what is actually going on so when they are actually rated they may not be able to adapt to that kind of traffic. It is what it is; you either sink or swim (Chief Controller 8, Interview Response, October 16, 2012).

Interview Question 15. Question 15, how experienced would you say your trainer/monitor corps is, was designed to gain insight on the experience level at given facilities.

Chief Controller 1 stated:

I'd say they are pretty experienced right now. The trainers and monitors here are experience, I'll compare that to any other base I have been to where, hang on [inaudible background noise] I think comparatively speaking, overseas bases have more experienced monitors. The majority of the three levels, they don't have to bank on the three levels or home grow their three levels for their manning. Stateside bases have to grow them if they don't, if they don't have the civilians there to support them they have to grow their three levels to get rated and then as soon as possible become trainers. And that's they are less experience stateside I believe, overseas bases such as this one, our monitors are relatively experienced especially since the majority of the guys here that are fully checked out and are all watch supervisor qualified, versus having, I think we have two people here, two five levels here that are fully

checked out exception for the watch supervisor position (Chief Controller 1, Interview Response, November 12, 2012).

Chief Controller 2 chimed:

Well they are not very experienced. They were are all, for the most part they were all three levels here at one point in time, got rated here and have been Vance base assigned. But I tell you they are all young kids, and they all do an outstanding job for no more experience than they have. I would say we are pretty well below average for experience (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3stated "I would say we have pretty well, pretty good experience with trainers."

Chief Controller 4 responded:

Low. We have a very low experience level. And that's basically from my newest five level all the way up to my military watch supervisors. As I said, everyone is home grown. I would say on the average my trainers probably have less than one year experience. That's all of them together, probably average less than year experience (Chief Controller 4, Interview Response, October 18, 2012).

Chief Controller 5 replied:

Very little experience. Most of them are within the past three or four years of earning their original CTO. Besides the civilians there are only six people who have even been to another facility or different certifications at other facilities. Everyone else is home grown, they are pretty good at knowing the localism, but not good at deciphering outside the ordinary situation. (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 stated "Oh very, very experienced." He continued "I would say with the experience that we have with the civilian controllers, and we do have a lot of younger staff sergeants and lot of younger senior airmen, I would say we above average in terms of experience."

Chief Controller 7 echoed the sentiments of many of his peers:

> They are not too experienced. I would say anywhere from six months to two to three years for the heart of our corps. Now we do have our civilians who have tons of experience, I'm talking about retired chief controllers, but the guys who do the majority of the training, I would say six months to two to three years of training (Chief Controller 7, Interview Response, November 15, 2012).

Chief Controller 8 replied "They are young. Right now, in my facility, I have one tech sergeant in the cab. My staff sergeants they have got probably two years' time in grade and that's probably my senior staff sergeant."

Interview question 16. Question 16, what complex issue normally presents apprentice controllers at your facility the biggest challenge, was designed to identify specific areas apprentice controllers face in an attempt to identify a trend.

Chief Controller 1 stated probably having to work multiple aircraft frames was the biggest challenge. He emphasized "Mixing fast movers with the barriers up down, heavy, P3s, barriers up down, wake turbulence that is created with the heavy, and then also multiple helicopters that fly in and out of here."

Chief Controller 2 replied:

> I think it is the sporadic traffic. Just the fact we don't know when we will actually get to control pattern s, so they don't get to go up there and train on pattern traffic every day. They

get up there and might only get center runway operations to where they are only saying cleared for takeoff and cleared to land and not actually getting to sequence anyone into the pattern (Chief Controller 2, Interview Response, October 11, 2012).

Chief Controller 3 offered the unique insight from being overseas:

Biggest challenge would be the knowledge application I think. It always goes back to the host nation restrictions this is not something you would see at a normal base back in the states this is ah, it is different training environment for those guys. You are mixing ICAO with FAA type regulations and host nation requirements and that kind of thing. That is the biggest challenge for trainees (Chief Controller 3, Interview Response, October 9, 2012).

Chief Controller 4 emphatically replied:

I would say, again I'm going to go back to the lack of traffic. You know, they ramp it up on the simulator, but then these guys get used to the simulator and sometimes corners are cut in the simulator. An example, they request release and a release is given right then and there all the time, where you don't get that in live traffic. You request release from Tampa and they wait five to ten minutes so translating busy traffic from the simulator to up there and see it. Some of them may not see that busy live traffic until rating day. You know, when they are up there constant, maybe five days straight doing a cert, and then they get hit with that live traffic. I think the lack of consistent busy traffic hurts us the most (Chief Controller 4, Interview Response, October 18, 2012).

Chief Controller 5 stated:

I would say that would be earning the respect from their trainers as what a true controller is supposed to be but at the same time not having the support from their trainer to become what a controller is. Many of my apprentice controllers have been complaining that they have been

left to study on their own more than usual and to figure it and don't come to me unless you have a problem. It definitely has been a trying situation, because generally controllers are pretty smart book wise when it comes to taking tests and stuff like that but it's the transition from book to application that definitely gives many of our apprentice controllers problems and that's where they are leaning on their trainers for help but the trainers want to give the trainees to much leeway into what can happen and not enough guidance on how it should happen in my opinion (Chief Controller 5, Interview Response, October 17, 2012).

Chief Controller 6 stated:

There are two I can list my opinion on that. The first is sequencing of the different patterns. Here at Tinker we use different patterns than a civil airport would use with our fighter aircraft, military fighter aircraft which is the overhead. They have to then sequence that with rectangular pattern aircraft, which have to be sequenced in with our instrument approaches or straight in approaches as well as any kind of circling approaches that are conducted to the intersecting runway.

The second issue I see as the biggest challenge for them is transitions through the airspace. Again, class Charlie pilots are required to contact us before transitioning our airspace. Because they are so focused on these particular patterns, the civilians are not in that pattern. And when they fly over the airspace, they can request just about any number ways to get through. (Chief Controller 6, Interview Response, October 4, 2012)

Chief Controller 7 stated "The traffic load. We are a fighter base. It does get moderate to heavy at times, and I think that is the biggest challenge for them."

Chief Controller 8 simply replied "Sequencing, that is the biggest one. Due to the different aircraft types."

The interviews were transcribed and imported into NVivo 10 software for analysis. NVivo 10 software was one of four specific programs Creswell (2012) recommended. According to their corporate website, QSR international states "NVivo is software that supports qualitative and mixed methods research. It lets you collect, organize and analyze content from interviews, focus group discussions, survey, audio-and now in NVivo 10- social media and web pages." Data analysis consisted of open coding to determine and identify themes.

In addition to directly answering the research question on situational leadership, the data revealed three additional themes: experience, role of the trainer, and apprentice controllers role during emergency situations.

Saturation is defined as "a state in which the researcher makes the subjective determination that new data will not provide any new information or insights for the developing categories. (Creswell, 2012, p. 627). Leadership is an extremely subjective topic and very rarely will everyone agree to the best course of action in a given scenario. At the conclusion of the interviews, the researcher determined additional interviews would lend no new information, only a different point of view; therefore, the topic had been saturated.

CHAPTER 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this qualitative study was to conduct interviews with United States Air Force air traffic control tower chief controllers to ascertain the preferred leadership style of their watch supervisors in given situations. The following four research questions were answered in this study:

1. What leadership style does a watch supervisor employ during normal operations when a fully certified controller is in position?

2. What leadership style does a watch supervisor employ during emergency or complex operations when a fully certified controller is in position?

3. What leadership style does a watch supervisor employ during normal operations when an apprentice controller is in position?

4. What leadership style does a watch supervisor employ during emergency or complex operations when an apprentice controller is in position?

The validity and reliability were delineated in Chapter 3 of this study. A panel of experts was surveyed and the mean of their responses was utilized as the expected outcome for each research question.

Summary of Findings

The purpose of this study was to determine the preferred leadership style of United States Air Force air traffic control tower supervisors. Data was collected utilizing semi structured interviews with eight chief controllers across the spectrum of USAF MAJCOMs. Each MAJCOM representative's answers to the research questions were assigned a value as follows: Directing Leadership- 1, Coaching Leadership-2, Supporting Leadership-3, and Delegating Leadership-4. Each respondent's answers were logged and the average answer was compared to the expert panel's mean answers to see how they compared.

In order to quantify the data retrieved from the MAJCOM representatives, the mean of their responses was utilized. Utilizing standard rounding, (1-1.49 rounded down to represent directive leadership, 1.50-2.49 rounded to represent coaching leadership, 2.50-3.49 rounded to represent supporting leadership, and 3.5 -4.0 rounded to represent delegating leadership), it was understood that this methodology tended to favor the middle responses since their spread was twice as wide. This fact being understood and acknowledged, all of the MAJCOM representatives means were unquestionably aligned with the corresponding weighted value assigned to the leadership style outlined in the previous paragraph. The data in figures 12-15 was extrapolated from the data contained in Table 1 below.

	RQ 1	RQ2	RQ3	RQ4
CCTLR 1	3	2	3	1
CCTLR 2	3	3	2	3
CCTLR 3	4	3	2	1
CCTLR 4	4	3	2	1
CCTLR 5	3	2	2	1
CCTLR 6	2	4	3	1
CCTLR 7	3	3	2	1
CCTLR 8	4	3	2	1
	3.25	2.875	2.25	1.25

Table 1 Breakdown of MAJCOM responses to research questions

Conclusions

The study findings compared very favorably to the results of the experts panel. In every instance the interview participants agreed with the expert's first or second leadership style as the appropriate style in the given scenario. As previously stated, it is very unusual to get 18 independent leaders to align so closely on a concept such as leadership.

In such a stressful environment, it would not be a stretch to think that the most common leadership style would have been directive. The fact that the preferred style in most instances was coaching or supporting is a testament to the supervisors' skill and professionalism and mirrors the results of the 2007 Swedish study.

Research question #1, "What leadership style does your watch supervisors employ during normal operations when a fully certified controller is in position," yielded a split result. Fifty percent of the respondents (4 of 8) selected supporting leadership as the preferred style, while

37% stated delegating was the preferred method. Seven out of eight chief (87.5%) controllers selected low directive behavior as the most appropriate style. The expert's panel selected supporting leadership as the best choice. An average of the MAJCOM representative's answers also selected supporting leadership as the most appropriate leadership style during normal operations.

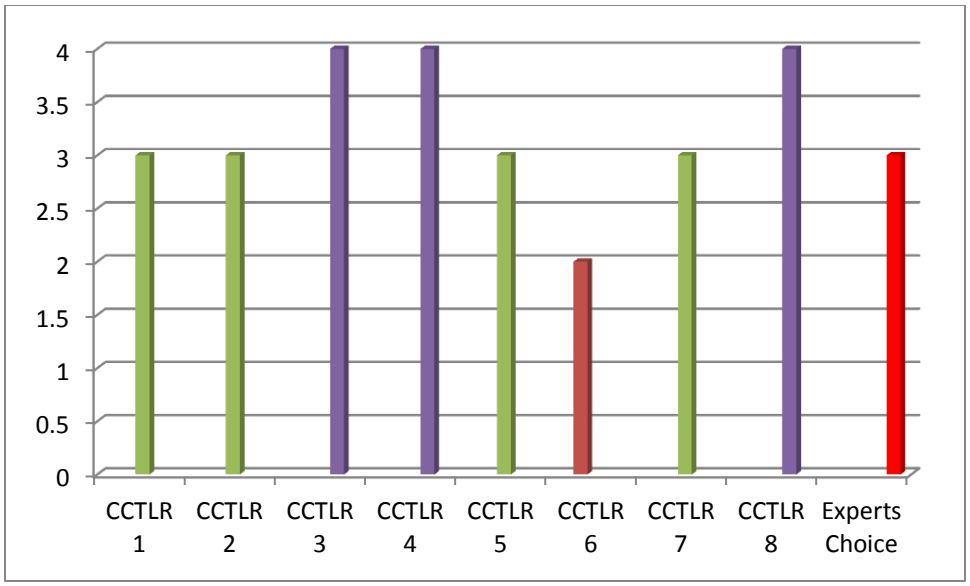

Figure 12 Figure 12 Responses to RQ #1

Research question #2, "What leadership style does your watch supervisors employ during complex or emergency operations when a fully certified controller is in position" was the most decisive response. Supporting leadership garnered 63% of the responses (5 out of 8), while coaching received two responses and delegating one. These responses were very close to the expert's panel as well. The expert's panel chose coaching leadership as the preferred leadership style during emergency or complex operations. The expert's consensus second best leadership style in this instance was supporting leadership. An average of MAJCOM respondent selections led to an overall selection of supporting leadership as the representative choice.

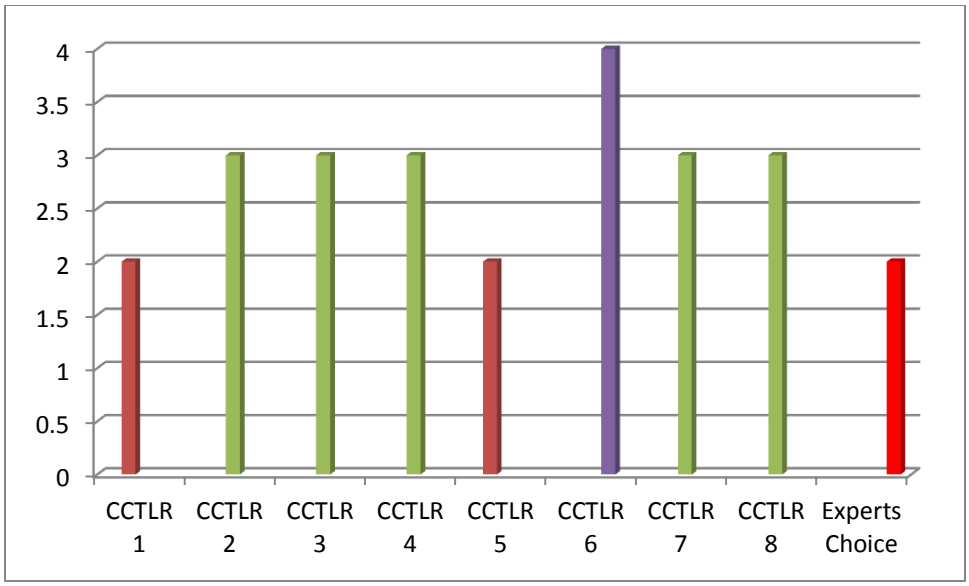

Figure 13 Response to RQ#2

Research question #3, "What leadership style does your watch supervisors employ during normal operations when an apprentice controller is in position", was the second most one sided of the responses. Six of the eight chief controllers stated coaching was the preferred leadership style in their facility, while the remaining two selected supporting. The key to this question was 100% of chief controllers interviewed recognized the importance of high supportive behavior when apprentice controllers are in position. The MAJCOM representatives again disagreed with the expert panel on the best choice for this question. The MAJCOM representative's selection, coaching leadership style, was actually the expert panel's second best choice. The expert panel selected directive leadership as the most appropriate style for this situation.

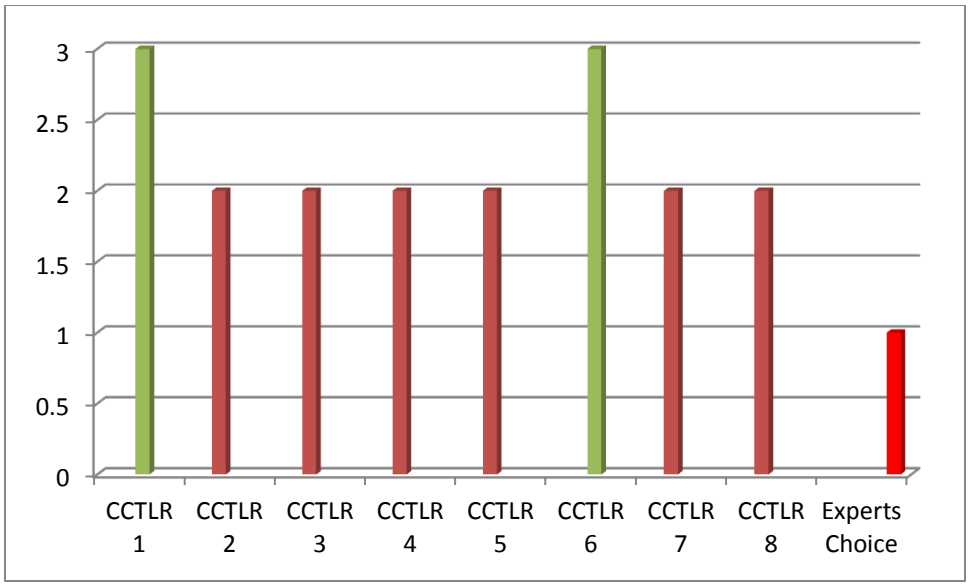

Figure 14 Responses to RQ#3

The final research question, "What leadership style does your watch supervisors employ during complex or emergency operations when an apprentice controller is in position", yielded the most definitive results. Seven of the eight (75%) of the chief controllers stated high directive behavior was vital. The remaining respondent stated high supportive and low directive behavior (supporting leadership) was the preferred method in this instance. The MAJCOM representatives selected directing leadership style as the best choice for this situation, disagreeing with the expert's panel. The expert panel selected supporting leadership as the best choice, and coaching leadership style as the second best choice.

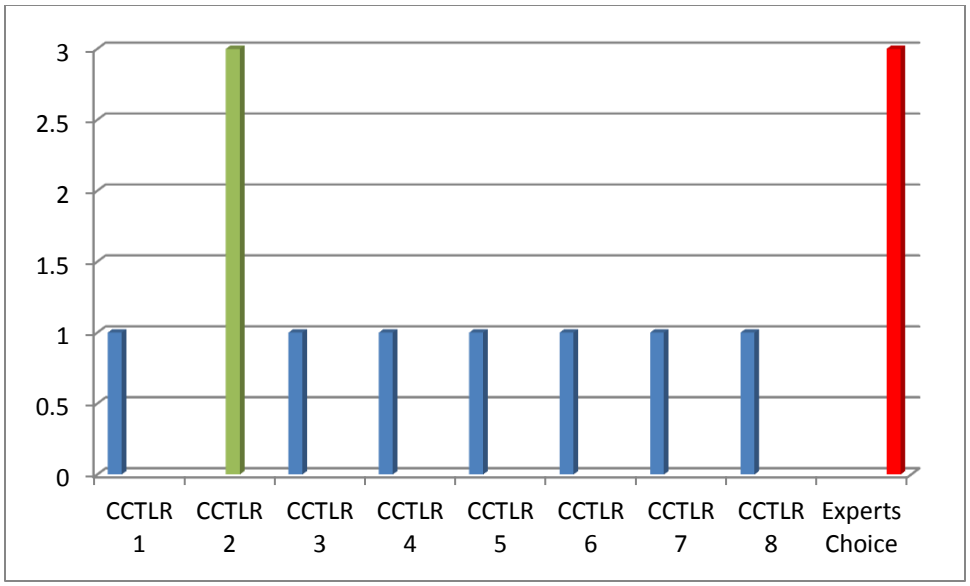

Figure 15 Responses to RQ#4

Across the board, the MAJCOM representatives selected the expert's first or second choice as the best leadership style in each research question. The biggest discrepancy occurred in research question #4, where the more experienced expert's panel selected supporting while; the MAJCOM representatives selected directing as the preferred method. This disparity could illustrate the experience gap in the two groups. Leadership styles are extremely subjective, so getting 18 leaders to align this closely was very surprising.

Each research question yielded at least a 75% rate of agreement within one leadership style, i.e., supporting to coaching, while three of the four questions rendered an 87.5% agreement rate within one leadership style.

Overall, four major themes developed over the course of the study. Experience level was constantly mentioned as prevalent throughout the study. Experience was broken down into two areas, military and civilians. Additionally, two major themes emerged in direction relation to interview questions #3 and #4: the role of the monitor and trainees are not allowed to work emergency situations.

Experience

As previously stated, the USAF is only staffed at 68% for the top four enlisted ranks. Historically, these ranks make up the majority of control tower leadership. Due to the lack of personnel, tasks have been "pushed down" a rank, for example duties such as watch supervisor traditionally assigned to technical sergeants (E-6) are now being carried out by staff sergeants (E-5).

Among the chief controllers interviewed, the average upgrade time for an apprentice control was approximately nine months. Figure in the eight months of basic military and air traffic control technical and the total time in service for a brand new certified controller is approximately one and half years. The Air Force mandates a minimum of four years' experience from the date a controller graduated technical training to become a watch supervisor. According to the Air Force Personnel Center, of the 722 staff sergeants in the air traffic control career field, 11% have the minimum requisite four years to become a watch supervisor. Overall, 78% of all air traffic control staff sergeants have between four and eight years' time in service and this datum is for all air traffic controllers, bear in mind radar approach controls are normally staffed at twice the levels of control towers. On the high end, controllers with six and half years' experience are leading crews**.**

Approximately 10 years ago the USAF recognized the need for continuity and staffing during an era of very high operations tempo. Military controllers were deploying worldwide in response to the terrorist attacks of September 11, 2001 leaving a tremendous void at the bases they deployed from. Across the Air Force, nearly 500 recently retired or separated military controllers were hired to maintain continuity of operations. Each chief controller who stated

their experience level was low, mentioned the civilian workforce at their base as the lynchpin for their training programs.

As the adage goes, there is no substitute for experience. The more experience a controller has the better they can handle a given situation. Air traffic control can only be learned by actual "time on the mike" and the more experience trainers and supervisors have, the farther they can let trainees stray before they have to intervene. The more latitude you can give a trainee the lower the learning curve will be for them. Control tower staffing although at all-time highs numerically, is nearly at all-time lows in experience level.

Role of the monitor

As previously stated any unrated controller is not allowed to take position without an experienced, rated controller, also known as a monitor, plugged in with them. This safety net is expanded further when apprentice controllers are working live traffic. When a prior rated controller earns a position certification, they are allowed to work that particular position without requiring a monitor, however, they will still require a monitor for any position they work which they are not certified in. For example, a previously rated controller earns a ground control certification, they no longer need to be monitored while working ground control, but anytime they are working another position they require a monitor. Apprentice controllers require a monitor until they are fully certified, therefore, if an apprentice controller earns a certification in ground control, but is still in training in local control, the apprentice controller would need to be monitored while working ground control.

The monitor is responsible for the decisions made by the trainee, while ultimate responsibility for everything lies with the watch supervisor. In the event the trainee makes an erroneous transmission, it is the monitor's job to correct the instruction immediately. Six of the eight chief

controllers interviewed mentioned the monitor's role would be the more directing approach while the supervisor would engage in a more supporting or coaching role. At first glance it would appear that a very laissez faire leadership style existed, however when taking into account the role of the monitor as the first line of defense, the supervisors more supportive and less directing role was easier understood.

Emergency Situations

The second emergent theme, apprentice controllers are not allowed to work emergency situations was echoed as well. In accordance with Air Force Instruction 13-204 (2010) apprentice controllers are not allowed to work emergency aircraft unless being formally evaluated for position certification. Therefore, all responses to research question #4 were targeted at complex operations only. Since emergency situations are stressful for both the pilot and controller, emergencies are trained on via simulated scenarios only. To effectively handle emergency situations, controllers must retrieve and relay pertinent data such as aircraft type and callsign, nature of the emergency (what's wrong), and the pilot's intentions. A seasoned controller recognizes through experience when to solicit this information, whereas inexperienced controllers may immediately attempt to retrieve the data not taking into account how busy the pilot is at the time.

Throughout the interviews another potentially alarming trend was identified. Six of the eight chief controllers or 75% of those interviewed stated the experience level of their trainers and monitors was very low. Only one stated the experience level at his facility was high, while the remaining chief controller stated his trainers and monitors had average experience. Of the six facilities with low experience levels, trainees experienced longer than average certification times,

and higher elimination rates. Increased volumes of apprentice controllers, and less experienced trainers and monitors seems to be a recipe for ineffective training.

Recommendations for Further Research

Although this study was able to accomplish its goal of determining which leadership style is preferred in a given situation, it would be interesting to learn the results of a much broader reaching study, whereas, 300 supervisors were surveyed and their data meshed together. Currently, the Air Force has a moratorium on new research studies, but perhaps in the future a researcher can obtain permission to conduct a much more extensive study and compare the results of broader scope survey with this one and see if the results are comparable. Facility chief controllers normally can readily identify trends in their facilities; gaining first hand responses from the supervisors would be very valuable.

Additionally, almost every chief controller stated their training load far exceeded their authorizations and capabilities. This directly impacted the time it took apprentice controllers to earn facility ratings and skill level upgrade. Trainee performance is a huge determinant of how long upgrade time is, however, there are factors beyond the trainee's span of control that drive upgrade time up. One of the most prevalent is training load. Each chief controller who was interviewed stated they were at least 100% manned in apprentice controllers, while some reported as much a 900% training load and trainees being in stopped training for up to six months due to the bottleneck. Air Force Instruction 13-204 (2010) defines stopped training as "When a trainee is unable to accomplish knowledge based (including classroom instruction), simulator (including static scenarios), and OJT due to unforeseen events or inability to meet standards" (p.110). Many apprentice controllers were in "stopped training" for as long as four

months. With a historic elimination rate of 30-35% during normal training levels, perhaps a future study should be conducted to address the impact the saturation of apprentice controllers has on a facilities ability to train.

A study centered on monitor interaction with trainees would prove fruitful for future trainers. Since monitors interact so closely with apprentice controllers while controlling live traffic, it would be a worthwhile endeavor to examine the dynamic between the monitor and apprentice controller.

Furthermore, additional research on the same information, except on civil air traffic controllers. This study would determine if there is a difference between civilian and military leadership styles.

Finally, a study showing the impact of mixing civil service air traffic controllers with military personnel would show if the impact on facilities is as great as the chief controllers interviewed believe. From all indications, civil service personnel have surpassed all expectations of simply providing continuity of operations and a study on their breadth of duties and impact would be greatly beneficial to not only the United States Air Force, but other military services employing civil service personnel as air traffic controllers as well.

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APPENDIX A

INTERVIEW PROTOCOL

Time of Interview:

Date:

Place:

Interviewer:

Interviewee:

Position of Interviewee:

Describe the project, telling the interviewee about (a) the purpose of the study, (b) the individuals and sources of data being collected, (c) what will be done with the data to protect the confidentiality of the interviewee, and (d) how long the interview will take.

Have the interviewee read and sign the consent form.

Questions:

1. What leadership style does a watch supervisor employ during normal operations when a fully certified controller is in position?
2. What traffic conditions, both volume and aircraft type, are considered normal for your facility?
3. In terms of complexity, how would you rate normal operations at your facility?
4. What is the biggest leadership challenge for your watch supervisors?

5. What leadership style does a watch supervisor employ during emergency or complex operations when a fully certified controller is in position?
6. What are some of the most common emergency situations at your facility?
7. What are some of the intricacies that make increases the traffic complexity in your facility?
8. How often do traffic conditions become complex at your facility?
9. What leadership style does a watch supervisor employ during normal operations when an apprentice controller is in position?
10. What is your current training load (apprentice controller) and how does that compare to the number you are authorized?
11. How long does it take an apprentice controller to gain a CTO in your facility?
12. In the last 18 months, how many if any apprentice controllers have been withdrawn? If applicable, what was the most common reason for withdrawal?
13. What leadership style does a watch supervisor employ during emergency or complex operations when an apprentice controller is in position?
14. Are there any restrictions or special precautions taken at your facility when apprentice controllers are working live traffic, particularly during complex operations?
15. How experienced would you say your trainer/monitor corps is?
16. What complex issue normally present apprentice controllers at your facility the biggest challenge

APPENDIX B
SITUATIONAL LEADERSHIP SUBJECT MATTER EXPERT

You have been selected as a subject matter expert to validate the results of my dissertation study. Please rank your answers from 1-4: 1 being the most correct, 2, being the next best, 3, being the third best answer, and 4 being the least correct answer. There are 25 scenarios, so it should only take approximately 20 minutes. Thank you in advance!

1. AA is a three level who has excelled in training. She is working local control during a weather recall. What type of leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

2. BB is a newly rated controller. Although he has earned his rating, he is still aggressively seeks new challenges. What type of leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

3. CC is your strongest controller. She is working local control during a complex traffic period. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

4. DD is working local control for the first time. His monitor has only been rated for eight months. Due to a construction project, you must perform single runway operations for arrivals and departures. What type of leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

5. EE has been rated in your facility for two years. She has a reputation as a very strong controller with a positive attitude and aggressively seeks new challenges. A new tactical pattern has recently been implemented and this is her first time applying it. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

6. FF is a complacent, fully rated controller who often misunderstands pilot requests. Traffic conditions are normal for your facility. What leadership style would use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

7. GG is the facility's controller of the year. She is the quintessential "go to" controller. She is working local control on the fly in day of the air show. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

8. HH has a saturated pattern. He begins mixing up callsigns, and stammering when issuing instructions. He has the reputation as being a solid performer. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

9. JJ is known to push the envelope when he gets busy, often taking short cuts to make things work. He is working local control during an ORI recovery. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

10. KK is a seasoned controller and trainer. You have assigned him to train a newly assigned three level. Bearing in mind the trainee is brand new, what leadership style would you apply?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

11. LL, an apprentice controller half way through local control training has only worked fighters in the simulator. The pattern is empty and two flights of four fighters divert to your base. What leadership style would you apply?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

12. MM is an apprentice controller who has never encountered an aircraft cable engagement. He has an emergency F-18 inbound who intends to take the cable. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

13. NN is experiencing difficulty in training. In his training evaluations, it has been continuously noted he has a negative attitude toward his training and is argumentative with his trainers. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

14.OO is facility rated, and considered a strong controller. Traffic went from moderate to busy very quickly. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

15. PP, a fully rated controller, is working ground control and two of the main taxiways are closed. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

16. QQ is a highly motivated three level. Despite his motivation, during normal to busy traffic, he struggles to keep up. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

17. RR is progressing satisfactorily in training. She takes position with during normal traffic conditions, with all patterns open. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

18. SS is a motivated apprentice controller. It is her second week in clearance delivery and still can't formulate a correct IFR clearance. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

19 TT is a strong controller. You want to begin his training in coordinator, however, he realizes that once he gets coordinator certified it will mean less breaks and is procrastinating at every opportunity. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

20. UU is working an exercise alert launch. She is working hard, but continues to incorrectly apply local procedures. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

21. VV is nearly ready for his rating, He is working a saturated pattern of fighter aircraft. He is not comfortable using reduced same runway separation, and service is starting to be degraded. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

22. WW is a newly promoted SSgt who has completed seven level training and is now in watch supervisor training. He has demonstrated trouble applying tasks even though you have gone over the material several times with him. His motivation is starting to wane. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

23. XX has been assigned as your crew's proficiency monitor. Last month, three people on your crew failed to meet proficiency requirements, because XX incorrectly filled out the proficiency tracker software. This adversely affected your ability to staff the facility. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

24. YY, an apprentice controller, signed off the new procedural change in the read file, however he has continuously forgotten to apply it in live traffic. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

25. ZZ, an apprentice controller, instructed a KR-35 to turn base inside a F-16 on a five mile final. Loss of required separation is certain to occur. What leadership style would you use?

( ) Delegating ( ) Supporting ( ) Coaching ( ) Directing

COMMENTS: Are there any questions or situations you feel should be included on this study? If so please include below.

APPENDIX C

EXPERT VALIDATION

	Yrs of Exp	Control Tower Ratings	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6n	Question 7	Question 8	Question 9	Question 10	Question 11	Question 12
EXPERT 1	22	6	2, 1, 3, 4	3, 2, 1, 4	1, 2, 3, 4	4, 3, 1, 2	4, 2, 1, 3	4, 3, 1, 2	2, 1, 3, 4	3, 2, 1, 4	4, 3, 1, 2	2, 1, 3, 4	4, 2, 1, 3	4, 3, 2, 1
EXPERT 2	30	8	4, 1, 2, 3	3, 1, 2, 4	1, 2, 3, 4	4, 2, 1, 3	2, 1, 3, 4	2, 1, 3, 4	3, 1, 2, 4	4, 3, 1, 2	4, 1, 2, 3	1, 2, 3, 4	3, 2, 1, 4	3, 1, 2, 4
EXPERT 3	26	6	3, 2, 1, 4	3, 1, 2, 4	1, 2, 3, 4	4, 3, 2, 1	1, 2, 3, 4	4, 2, 1, 3	1, 2, 3, 4	4, 3, 2, 1	4, 3, 1, 2	1, 2, 3, 4	3, 2, 1, 4	3, 2, 1, 4
EXPERT 4	25	9	4, 2, 1, 3	3, 1, 2, 4	1, 2, 3, 4	4, 2, 1, 3	2, 1, 3, 4	4, 2, 1, 3	1, 2, 3, 4	4, 3, 2, 1	4, 3, 1, 2	1, 2, 3, 4	4, 1, 2, 3	4, 3, 1, 2
EXPERT 5	22	7	3, 1, 2, 4	4, 2, 1, 3	3, 1, 2, 4	4, 1, 2, 3	3, 1, 2, 4	4, 1, 3, 2	3, 1, 2, 4	4, 1, 3, 2	4, 1, 3, 2	2, 1, 3, 4	4, 1, 3, 2	4, 3, 2, 1
EXPERT 6	20	5	3, 1, 2, 4	4, 2, 1, 3	1, 2, 3, 4	4, 3, 1, 2	4, 2, 1, 3	4, 3, 1, 2	2, 1, 3, 4	4, 1, 2, 3	4, 3, 2, 1	1, 2, 3, 4	4, 3, 2, 1	4, 3, 2, 1
EXPERT 7	25	7	4, 2, 1, 3	3, 1, 2, 4	1,2, 3, 4	4, 3, 2, 1	3, 1, 2, 4	4, 3, 2, 1	2, 1, 3, 4	4, 3, 1, 2	4, 3, 2, 1	1, 2, 3, 4	4, 3, 1, 2	4, 3, 2, 1
EXPERT 8	27	6	4, 2, 1, 3	3, 1, 2, 4	3, 1, 2, 4	4, 3, 1, 2	4, 1, 2, 3	4, 3, 1, 2	3, 1, 2, 4	4, 3, 2, 1	4, 3, 2, 1	2, 1, 3, 4	4, 3, 1, 2	4, 3, 2, 1
EXPERT 9	29	7	3, 2, 1, 4	1, 3, 2, 4	3, 1, 2, 4	4, 3, 2, 1	3, 1, 2, 4	4, 1, 2, 3	3, 1, 2, 4	4, 3, 2, 1	4, 1, 2, 3	3, 1, 2, 4	4, 3, 2, 1	4, 3, 2, 1
EXPERT 10	30	8	1, 2, 3, 4	4, 1, 2, 3	1 ,2, 3, 4	4, 1, 2, 3	4, 1, 2, 3	4, 3, 1, 2	1, 2, 3, 4	4, 3, 1, 2	4, 3, 1, 2	1, 2, 3, 4	4, 1, 2, 3	4, 1, 2, 3
	25.6	6.9												
		Experts Ranking	3, 1, 2, 4	3, 1, 2, 4	2, 1, 3, 4	4, 3, 1, 2	3, 1, 2, 4	4, 2, 1, 3	2, 1, 3, 4	4, 3, 1, 2	4, 3, 1, 2	1, 2, 3, 4	4, 2, 1, 3	4, 3, 1, 2

Question 13	Question 14	Question 15	Question 16	Question 17	Question 18	Question 19	Question 20	Question 21	Question 22	Question 23	Question 24	Question 25
4, 3, 2, 1	2, 1, 3, 4	3, 1, 2, 4	4, 3, 1, 2	4, 1, 2, 3	4, 3, 1, 2	4, 3, 2, 1	4, 3, 1, 2	4, 3, 2, 1	4, 2, 1, 3	4, 2, 1, 3	4, 3, 2, 1	4, 3, 2, 1
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Experts Ranking												
4, 3, 2, 1	3, 1, 2,4	3, 1, 2, 4	4, 2, 1, 3	3, 1, 2,4	4,3, 2, 1	4, 3, 2, 1	4, 3, 1, 2	4, 3, 2, 1	4, 3, 1, 2	4, 3, 2, 1	4, 3, 2, 1	4, 3, 2, 1

Question Clusters	Best Choice	2d Best	3d Best	4th Best
RQ # 1	Sup	Coach	Del	Dir
RQ # 2	Coach	Sup	Dir	Del
RQ #3	Dir	Coach	Sup	Del
RQ #4	Sup	Coach	Dir	Del

APPENDIX D
IRB Approval/Informed Consent Letter

INFORMED CONSENT FORM
OKLAHOMA STATE UNIVERSITY

Title: Situational Leadership in United States Air Force Air Traffic Control Towers

Investigator(s): William D. Melton, Oklahoma State University College of Education

Purpose: This study will provide United States Air Force air traffic control supervisors a snapshot of the preferred method their peers worldwide handle given situations. Armed with this knowledge, supervisors will be able to identify both appropriate and inappropriate leadership styles.

What to Expect: This research study is administered via telephonic or face or face to face interviews. Participation in this research will involve an interview that will last approximately 30 minutes and consist of 16 site specific questions to support the study's four research questions.

Risks: There are no risks associated with this project which are expected to be greater than those ordinarily encountered in daily life.

Benefits: This study will assist supervisors determine the best leadership style based on the opinions of supervisors in USAF control towers worldwide.

Compensation: You will not be compensated for your participation in this study.

Your Rights and Confidentiality: Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time, without penalty.

Confidentiality: All information about you will be kept confidential and will not be released. You will not be identified individually; we will be looking at the group as a whole. All recordings and transcription of the recordings will be stored on the researcher's computer until 1 September 2013 and then deleted.

Contacts: You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study: William D. Melton, 935 Tower Rd, Tinker Air Force Base, OK 73145. (405) 734-6622 or DSN 884-6622 or Chad Depperschmidt 317 Willard Hall, Stillwater, OK 74078 (405) 744-8146. If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu

NAME, RANK, USAF
Control Tower, Chief Controller

VITA

WILLIAM DAVID MELTON

Doctor of Education

Thesis: SITUATIONAL LEADERSHIP IN UNITED STATES AIR FORCE AIR TRAFFIC CONTROL TOWERS

Major Field: Applied Educational Studies

Biographical:

Personal Data: Born Memphis, Tennessee, the son of Charles Everett and Brenda Dale Melton

Education:

Completed the requirements for the Doctor of Education in Applied Educational Studies, Aviation and Space at Oklahoma State University, Stillwater, Oklahoma/USA in May, 2013.

Completed the requirements for the Master of Science in Aerospace Administration and Logistics at Southeastern Oklahoma State University, Durant, Oklahoma/USA in December, 2008

Completed the requirements for the Bachelor of Science in Aviation Management at Southeastern Oklahoma State University, Durant, Oklahoma/USA in December, 2007

Experience: Adjunct Professor, College of Continuing Education, University of Oklahoma, 2012 to present; USAF Assistant Chief Controller/Simulator Administrator (DoD civilian) 2005-2010; USAF Control Tower/RAPCON Chief Controller 2000-2005; Chief Air Traffic Control Training, 1996-2000; Air Traffic Control watch supervisor 1990-1996

Professional Memberships: Air Force Sergeants Association,