

# **MIND GAMES: THE ONTOLOGY OF AVIATION SAFETY AND ITS CONSEQUENCES**

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## **Abstract**

The regulation and administration of aviation within this country is greatly influenced by a core set of beliefs concerning the safety of aircraft and their operation. This core set of beliefs is referred to as the *ontology* of aviation safety because it is grounded in a particular reference to reality. The *ontology* of aviation safety is founded upon the beliefs that aviation operations are either “safe” or “unsafe”, that accidents are preventable, and that if accidents happen then culpability is attributable. These core beliefs support an objectified/reified view of safety which represents a particular reality.

Language, more than any other attribute, separates man from other animals. It is through language that man communicates his most profound feelings and ideas. A very basic premise of this dissertation is that language usage reflects beliefs and values. The use of the terms “safe” and “unsafe” when referring to aircraft operations represent the belief that “safe” is an attainable state, in other words, it represents an objectified/reified view of aviation safety. A hermeneutic interpretive approach was used to examine language use within various aviation texts to include: newspaper articles, speeches by Federal Aviation Administration (FAA) officials, testimony by FAA officials before Congress, and selected books concerning aviation safety.

By referring to aviation operations as either “safe” or “unsafe” in discourse and dialogue an objectified/reified view of aviation safety is subtly perpetuated. This view is deeply rooted in the American concept of aviation safety.

## ACKNOWLEDGEMENTS

### **High Flight**

Oh! I have slipped the surly bonds of earth  
And danced the skies on laughter-silvered wings;  
Sunward I've climbed, and joined the tumbling mirth  
Of sun-split clouds - and done a hundred things  
You have not dreamed of - wheeled and soared and swung  
High in the sunlit silence. Hov'ring there  
I've chased the shouting wind along, and flung  
My eager craft through footless halls of air.  
Up, up the long delirious, burning blue,  
I've topped the windswept heights with easy grace  
Where never lark, or even eagle flew -  
And, while with silent lifting mind I've trod  
The high untresspassed sanctity of space,  
Put out my hand and touched the face of God.

*Pilot Officer Gillespie Magee*

*No 412 squadron, RCAF*

*Killed 11 December 1941*

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# **CHAPTER I**

## **PROBLEM STATEMENT**

### **Introduction**

Aviation safety is a topic that is never far from public attention, and one that is frequently dredged to the surface of media focus by tragic events such as major aircraft accidents and terrorists attacks. Traditionally, aviation safety has been viewed as a technical topic and left in the hands of experts such as the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB). Within most university circles aviation is perceived as a vocational pursuit unworthy of serious academic attention and a subject that is intellectually more at home in the realm of technical schools and junior colleges. As a result, flying safety is not a subject that is often broached in scholarly journals. However, the events of 11 September shocked the world and have proved to be a watershed for redefining concepts and perceptions about aviation safety and security. It can only be hoped that recent events will act as a catalyst for scholarly interest and inquiry into a field that has been sadly neglected by academics.

It is hoped that this project will prompt further scholarly interest in aviation safety, and serve to help legitimize the subject within academic circles. There is a wealth of public administration theory applicable to the study of aviation safety, and the time is certainly ripe for its application. The careful scrutiny and thoughtful scholarship applied to more traditional subjects of public administration research holds much promise for the field of aviation safety. Perhaps the highly technical nature of flying sophisticated aircraft tends to intimidate non-flyers and dampens enthusiasm for scholarly research. Whatever the reason, it appears that public administration (PA) scholars have not been enamored with aviation as a fertile area for scholarly research. There is no reason for this. In fact, within the medical realm which, like aviation, is very technically oriented, PA scholars have shown considerable interest in examining that field from an administrative and governance perspective.

It is not that aviation safety is a neglected field of inquiry from a purely resource (both

time and money) or national agenda perspective. In fact, tremendous amounts of human energy and material resources are devoted to making our skies safer. We have two federal agencies (i.e. FAA and NTSB) created for the exclusive purpose of enhancing aircraft safety and air travel. In addition there is a multitude of aviation related non-profit organizations and professional associations with a vested interest in aviation safety. The sheer volume of written material and data dedicated to aviation safety is mind boggling. For example, the FAA maintains the National Aviation Safety Data Analysis Center (NASDAC) at its headquarters in Washington D. C. The NASDAC information brochure states that “with a data storage capacity exceeding 300 billion bytes of information (a stack of documents 500 times the height of the Washington Monument), NASDAC houses one of the most extensive collections of aviation data in the world (25 separate data bases)...a suite of advanced search tools enables analysts to perform integrated queries across multiple databases, search labyrinth of warehoused data, and display pertinent elements in an array of useful formats”. It is easy to see that a concerted technical information collection and research effort is being aggressively pursued.

What is missing, however, is much of a scholarly effort to explore the administrative and governance aspect of aviation safety. In fact, one is hard pressed to find an article dealing with aviation safety in any of the scholarly journals. The problem is that almost all of the intellectual effort invested in aviation safety is devoted to the technical aspects of flying, and there has been little if no interest from academics for scholarly research from a public administration perspective. Make no mistake; flying in the 21<sup>st</sup> century is a highly complicated and technical endeavor. Stepping into the cockpit of a modern jet aircraft is like stepping into one of the virtual reality rooms at Virginia Tech’s state of the art computer complex.

Aviation is an immense industry regulated by federal, state and local government agencies. According to the 1997 *White House Commission on Aviation Safety and Security* “commercial aviation generates over \$300 billion annually, and accounts for close to one million American jobs... in fact, the FAA projects that, in 2007, more than 800 million passengers will fly in the United States --- three times the number who flew in 1980”. Jane Garvey, the FAA Administrator testified before Congress that “ the FAA is a 24-hour-a-day, seven-day-a-week service delivery organization... we safely manage approximately 200,000 take-offs and landings

every day in a system that moves over 600 million airline passengers per year... we expect 30 billion cargo ton miles of high-priority shipped cargo this year, which represents an 88 percent increase since 1990”.

It is easy to see that the aviation industry has an immense impact on the American economy and permeates the lives of almost all citizens in one way or another. This industry and the federal agencies that provide oversight are indeed important parts of our political economy and system of governance. Yet, pathetically little research has been devoted to understanding the public administration aspects of aviation safety from an institutional or system perspective. The purpose of this dissertation is to explore a portion of this virgin territory by examining the underlying mindset of aviation safety upon which its daily governance and administration rests. More specifically, the concept presented is that an *ontology* exists within the aviation community that manifest itself in a perspective that drives the way we think and act in addressing aviation safety issues. The conceptual lens adopted in this dissertation views aviation safety policy as being driven by a community of aviation institutions/agencies that share a common *ontology*.

### **Concept of Ontology Applied to Aviation Safety**

Understanding the *ontology* of aviation safety is the starting point and key to understanding the policies, administration and governance of aviation safety that have evolved throughout the history of aviation within this country. The word *ontology* was chosen deliberately because of its connotation and powerful mental image. This term is usually associated with the discipline of philosophy and normally refers to the study of beliefs concerning the very nature of being or existence.

“The word ontology was coined in the early seventeenth century to avoid some of the ambiguities of ‘metaphysics’; Leibniz was the first major philosopher to adopt the word. The terminology introduced by Christian Wolff in the early eighteenth century came to be widely

adopted: ontology is the general theory of being. In the usage of twentieth-century analytical philosophy, ontology is the general theory of what there is... For instance, questions about the mode of existence of abstract entities... are ontological questions.” (Thomas Mautner, 1996).

James K. Feibleman states in his book entitled *Ontology* “That everyone, even the most astute technical philosopher, even the most empirical epistemologist, begins with belief...” ( Feibleman, 1968,). He goes on to state that “The first effort of everyone who comprehends the power of ontology ought to be directed toward discovering what implicit ontological presuppositions are contained in his position...” (Feidleman, 1968,). This is precisely the purpose of this dissertation: to examine the ontological presuppositions of the concept of aviation safety in public dialogue.

The basic question that *ontology* addresses within its traditional context centers on the concepts of an objective reality as opposed to a socially constructed reality and vice versa. In other words, does the world exist apart from man’s existence, or is the world solely a mental image and a product of the mind. Likewise within aviation safety a certain reality is assumed and accepted which underlies the way aviation safety is viewed. The basic premise of this project is that there is indeed a belief system within aviation safety (i.e. ontology) that lies beneath the conscious level that dictates the way we think about safety of flight issues. The word *ontology* best captures the fundamental nature of this belief system.

Other words and concepts such as rhetoric or discourse could have been chosen to describe the idea of an aviation safety mind set, but they do not adequately represent what is put forth in this paper. Rhetoric and discourse reside in the conscious and are much more superficial than the mental image presented by the concept of an *ontology*. Without doubt there is most certainly a rhetoric and discourse of aviation safety. But they are separate and are derived from fundamental and basic beliefs concerning the nature of safety that can be thought of as an *ontology*. For example, the idea of something being “safe” is at the core of this belief system. What do we mean when we say “an airplane is safe” or “a flight is safe”?

In order to understand the meaning of these statements one has to go beneath the surface

to examine the basic belief system of aviation safety. The government, the aviation industry, the media, and the public all use the words and concepts of “safe” and “safety” when evaluating and assessing aviation, but one rarely if ever sees any reference to the underlying premises of these concepts. The tenets of the aviation safety belief system acquire meaning from three core beliefs. First, situations are either “safe” or “unsafe”. Second, because a situation can be made “safe” it can be prevented. Third, if accidents are preventable, then culpability can become an issue. How we understand and define these concepts is similar to the question of reality that concerns *ontology* within the field of philosophy. The concepts of “safe” and “safety” in effect establishes the reality upon which everyday aviation safety rhetoric and discourse rests, and as such can be thought of as an ontological issue.

For example, when aviation rhetoric talks about an airplane being “safe” to fly the implication is that “safe” is a state of being. It is something tangible, real, and identifiable! It is an obtainable state that can be reached. In fact, the reality of aviation safety is complex, deep, and far reaching, and always involves the integration of a number of important considerations. My own schematic for assessing flight safety is constructed around four core considerations which are as follows: The operator (i.e. pilot or pilots), The equipment (i.e. aircraft involved), The operating procedures (i.e. company rule/procedures), and The operating environment (i.e. geography/weather). Within each core consideration there is an almost unlimited number of factors to evaluate. The following table is an example of some of the most fundamental factors within each core area, and is rudimental at best.

<u>Pilot/Pilots</u>	<u>Equipment</u>	<u>Procedures</u>	<u>Environment</u>
Total hours	Aircraft make	Runway Required	Terrain
Types of aircraft	Age of aircraft	Crew Rest	Day/Night Ops
Rating	Maintenance	Wx Minimums	Weather (VFR/IFR)
Certificates	Instrumentation	Checklists	Hot/Cold
Health	TCAS	Management	Takeoff Conditions
Morale	GPWS	Flight Following	Wx hazards

Of course the list within each category could be expanded greatly, and with each expansion the safety assessment would become more refined. The point is that the assessment of aviation

safety is an ongoing and never ending process.

This type of thinking is fundamentally different from a concept of something being “safe” or “unsafe”. Safety in this above sense is more in line with an ideal of acceptable risks. Following this line of reasoning nothing in this world can be completely “safe”, only degrees of safety can be talked about. These two approaches to the concept of safety are dramatically opposed to one another. One is objective in orientation while the other is subjective. Within this context the concepts of “safety” and “safe” can legitimately be considered as ontological issues because they establish the reality base for an overall approach to aviation safety. It is similar to the basic ontological reality question confronting traditional philosophy. In this respect it is equally important within the aviation community because it establishes the basis for the governance of the aviation industry.

The difference between believing that “safe” is something real as opposed to something that represents a human assessment is tremendous. Its impact within aviation is just as important as the ontological question of reality is in philosophy. It is important because these are foundational beliefs that drive the way one thinks about most other aspects of aviation. It is because of the very fundamental nature of these beliefs that they can be considered ontological issues. Suggesting that an *ontology* exists within the aviation safety community is a powerful concept, but this term best captures the sense of what will be presented. The core belief and basic premise of this dissertation is that within the aviation community a set of basic beliefs prevail regarding the nature of aviation safety that dictate the way we think about aircraft accidents and aviation safety. These beliefs are basic and rudimentary, and are rarely acknowledged publicly. For this reason the case for borrowing the concept of *ontology* from philosophy and applying it to aviation safety is more than justified.

There is a very important point concerning the use of the concept of *ontology* as it applies to aviation safety that needs clarification. To begin with the hypothesis put forth in this work is that an *ontology* exists within the aviation community that frames the way the subject of aviation safety is discussed and presented publicly. In other words, public discourse concerning aviation safety uses language that supports a particular orientation or approach to aviation safety that is so ingrained and fundamental that it warrants being referred to and treated as an *ontology*.

Furthermore, it is proposed that this *ontology*, as it is referred to, can be identified by examining selected written aviation safety texts. What is being put forth is the idea of a “professional community ontology” that is the driving force that determines the way the community approaches safety issues and then guides public discourse. It is important to understand that this concept does not imply for a moment that all individuals within the professional aviation community believe this *ontology* at a personal level.

Within the aviation safety community there are literally thousands upon thousands of individuals representing a variety of organizations engaged in a discourse related to aviation safety. These individuals come from diverse personal and professional backgrounds with different levels of education, technical expertise and experiences. It can only be assumed that their personal beliefs concerning aviation safety run the gamut. For example, an NTSB aircraft accident investigator is a member of a very select group within the NTSB that has extensive training, education, and expertise in the technical aspects of aircraft accidents. His or her depth of knowledge and sophistication is considerable. If this type of individual were compared to say a staff member of an aviation consumer advocacy group the contrast would be considerable. Likewise, top FAA administrators probably hold different personal beliefs concerning aviation safety than industry executives from companies such as McDonald-Douglas or Boeing. The point is that individual beliefs will vary widely within the aviation industry concerning safety, but this does not negate the premise that a vibrant professional community belief system exists that guides public discourse relevant to aviation safety.

In a similar manner if one approaches the subject from an institutional perspective, it is easy to see that the numerous organizations concerned with aviation safety represent an array of interests resulting in differing agendas. If one looks at organizations as the unit of analysis versus individuals the same logic should apply. It seems reasonable that individual organizations might have different types of belief systems that do not conform exactly to the “community ontology”. For example, The Airline Pilots Association, The Air Traffic Controllers Association, Passenger Consumer Groups, Major Aircraft Manufactures, The FAA, The NTSB, and any number of other organizations have a legitimate stake in aviation safety issues in this country, yet their individual organizational belief systems might be more narrow and tailored to

accomplish their mission. They represent a diverse community of organizations all with a vested interest in aviation safety, yet their organizational cultures and beliefs concerning aviation safety are probably quite different. It is safe to assume that organizational beliefs will vary just as individual beliefs will vary concerning safety of flight issues. Yet, the hypothesis put forth here is that all of these organizations use language in public discourse with the implicit ontological presupposition that being “safe” in aviation is something real, achievable, and sustainable.

The fact that individual and organizational beliefs may differ from those of the professional community does not negate the possibility of a “professional community ontology”. The purpose of this paper is to explore whether a “professional community ontology” exists in spite of differing individual and organizational beliefs, and to examine how such an *ontology*, if it exists, could frame the boundaries of public discourse relevant to aviation safety issues. It should also be stressed that buying into and perpetuating the *ontology* of aviation safety is not a conscious act. Individuals do not sit around and review every word that is written to make sure that it conforms to the accepted *ontology*. On the contrary, like most deeply held beliefs it is a much more subtle process that involves the subconscious. Nonetheless, it is ever present and acts as a powerful influence in the way not only the aviation community, but also we as a public think and talk about aviation safety issues.

### **Theoretical Framework: Institutionalism, Ontology, and Linguistics**

The concept of *institutional community* is an important conceptual framework useful in explaining how an *ontology* evolves and is perpetuated with regard to a particular policy arena. The conceptual framework of institutional community draws upon a variety of organizational theory including but not limited to: *institutionalism*, *policy network theory*, *policy subsystem theory*, *epistemic community theory*, and *discourse community theory*. The unifying concept in all these theories is what might be called the social aspect of organizations. Organizations are created to perform certain tasks or missions, and in order to carry out their missions organizations must interact within the existing economic structure and system of governance.

Furthermore, much of current organizational theory is based on the premise that organizations operate in an “open system” (Scott, 1998) where organizational success and survival often depend upon, and to a degree are defined by other organizations. It is the idea of interdependence that links the varieties of organization theory mentioned above.

For example, neo-institutionalism uses the concept of “fields” to explain this relationship. This strain of theory views institutions as operating within a “field” of other similar institutions where collective behavior and actions of the “field” has a norming effect on individual institutions (Powell and DiMaggio 1991). The thrust of this line of study is to view institutional output as reactive, and a result of institutions vying for acceptance and approval within the “field”. Policy network and subsystem theory differ somewhat in that they are more focused on power and resource relationships; however, they are still firmly grounded upon a concept of interdependence of organizations. Epistemic community theory, although knowledge based, is also built upon the same premises. The concepts of institutional fields, networks, subsystems, epistemic communities, and discourse communities all depend upon the basic aspect or characteristic of organizational interdependence and socialization.

This general framework serves as a springboard for the conceptual leap to the idea that various organizational communities share a particular ontological base. Ontological base in this sense refers to the very rudiments of a belief system that are most often carried within the subconscious and rarely if ever recognized or discussed. In the past, numerous metaphors have been applied to organizations (e.g. *machines*, *organisms*, *brains*, and *political systems*), but perhaps the metaphors of organizations as *cultures* or *psychic prisons* come closer to capturing or framing the concept of an institutional ontology although neither is adequate. For instance, culture is recognizable, definable and often celebrated by its members. Organizational culture is recognized and perpetuated, and exists at a conscious level above the concept of a subconscious *ontology*. Psychic prison on the other hand is too restrictive and confining. It assumes that there is a world outside prison walls, and in fact derives its meaning by reference to that existing world. My concept of *ontology* is quite different; it might accommodate the notion of different worlds, but never a bigger world. It is probably more akin to Thomas Khun’s concept of a paradigm (Khun, 1969), with the caveat that it is not necessarily incommensurable with other

ontologies, but rather has excluded them for various reasons.

The concept of institutional ontology used here is concerned with those beliefs that are so rudimentary and basic that they lie beneath the level of conscious dialogue. In fact they are the very premises and assumptions that allow dialogue. I firmly believe that there is such a thing as an aviation safety community that can be viewed as a community of institutions; and furthermore, that this institutional community shares a particular ontological base that frames discussion, dialogue and actions of aviation safety. The goal of this project is to identify the *ontology* upon which current concepts of aviation safety rest, and to explore some of its implications.

For example, the idea that aviation safety is an objective entity, as mentioned above, is prevalent in most of the writing concerning aviation safety, and is a view that is generally held by the public. This objectified/reified concept of aviation safety allows the perception of a particular aircraft or flight as being “safe” or “unsafe”. This perception stems from the scientific and technical nature of aviation. The logic flows from the fact that modern aircraft are machines composed of a collection of metal, composites, tubing, wiring, pumps, and computers all integrated into a platform that can defy gravity. We view machines as objects, and subconsciously project this concept to aviation safety. Yet, nothing in this world is completely “safe”; in fact, everything that man does involves risks.

Risk assessment is perhaps a much more meaningful concept used extensively in the financial, insurance, and medical fields. However, within the aviation community, rhetoric of aviation safety tends to refer to situations as being “safe” or “unsafe”; and consequently, preventable. This objectified/reified concept of safety is very much a part of the *ontology* that I believe exists, and that this project will attempt to identify. The goal of this project is to make the case that an *ontology* exists in aviation safety and to identify certain core beliefs of this *ontology* using a hermeneutic methodology to examine written texts generated within the aviation safety community of institutions. It is hoped that the scholarship proposed in this project will apply existing institutional theory in an innovative way that will help bridge the gap between theory and practice within the realm of aviation safety.

Thus far the discussion has focussed first on the idea of a professional community

*ontology*, and second on the idea that this *ontology* is perpetuated within a communal institutional setting. The conceptual framework presented combines the ideals of an *ontology* and an *institutional community*. In other words, the concept presented states that a basic belief system (i.e. ontology) predicates discussion, dialogue, and actions within the community of institutions (i.e. FAA, NTSB, etc.) concerned with aviation safety. At this point we have talked about the *what* of the project (i.e. professional community ontology) and *where* the *what* takes place (i.e. institutional community). What is missing in the conceptual framework is the *how*, and the *how* concerns language, and the role language plays in our personal and professional lives.

Language is inescapable and such an intricate part of human existence that it is often taken for granted as we negotiate the demands of everyday life. Yet language is at the very core of man's being. Within the academy, language and concepts of language touch all disciplines and are of particular interest to linguists and philosophers. They are concerned with the fundamental questions of 'what is language?' and 'how is it used?'. In terms of 'what is language' there are generally two poles from which theories gravitate. One pole centers upon the concept of language as a "road map" where language is merely a tool used to convey ideas and knowledge about a real world (Grace, 1987). In this sense, language is a descriptive devise (i.e. road map) that is neutral in terms of imparting meaning to dialogue. Language is merely a means to carry an idea from the sender to the receiver and does not affect the meaning of the message. The concept resembles the relationship of a letter and the envelope in which it is sent. The envelope is merely a container used to transport the message.

At the other end of the pole is the belief that language is far from being neutral, and in fact language has an active and constitutive role in human dialogue. This is the view of language that informs the concept of an "institutional community ontology" presented. The *ontology* that exists within the institutional community is informed and perpetuated by a particular choice of words and use of language. Furthermore, language use within the aviation community has an epistemic effect in that it defines and channels knowledge concerning aviation safety. The fundamental assumption of this project is that language has been used within the aviation safety community to present a very definite view and belief frame for understanding aviation safety.

The idea that language use can be constitutive and epistemic is certainly not new. The social constructivism movement within sociology shares similar views. Berger and Luckman's *The Social Construction of Reality* (Berger & Luckman, 1966) is considered by many as the landmark text of this movement. The essence of Burger and Luckman's argument is that one's concept of reality is the product of something that is socially negotiated. An individual has very limited direct experience in his world and consequently, must rely on second hand accounts of what goes on in the world. Language is the tool that is used by humans to relay ideas, concepts, perceptions, and beliefs that reference a world that they have not directly experienced. George W. Grace wrote a book in 1987 entitled *The Linguistic Construction of Reality* which further refines the argument presented by Berger and Luckman. Grace reasons that since language is the means by which humans relay perceptions of reality, then reality is more accurately described as a linguistic construction. The concept of a linguistic construction of reality offers an excellent framework for how language is viewed in this project.

The *ontology* that exists within the institutional community of aviation safety is dependent upon language for its creation and perpetuation. In fact, many of today's complex social endeavors have created specialized language as they have developed. For example the legal community, the scientific community, the various religions, and even disciplines within the academy, to cite only a few, have unique uses of language that have developed over the years. I carry this concept a step further to a degree where *ontology* and language are mutually dependent. Perhaps the best way to get a better idea of the linguistic framework used in this project is to offer a list of basic ideas that inform this framework. This list includes recollections and paraphrases of ideas presented in a number of books and articles concerned with various aspects of the study of language. The list would include but certainly not be limited to the following:

- conceptual content is constitutively tied to linguistic meaning
- people develop cognitive schemata
- language makes possible the creation and transmission of symbols
- using language consists in the making of linguistic choices, consciously or unconsciously for linguistic or extra-linguistic reasons

- thought patterns are greatly influenced by the language practiced in organizations
- language in a bureaucracy often becomes euphemistic when a particular word or phrase is used as a substitute for the true expression of the individual's thoughts or feelings
- rhetoric is the strategic organization and communication of a speaker's version of events within a situation in order to effect the here and now of audience decision-making
- scientific understanding attempts to objectify problem situations and to seek logically to establish causal relationships by following a hierarchical structure of problem-solving procedures
- scientific texts employ stylistic figures and rhetorical devices to position skeptical audiences
- allegorical properties of science
- grammatical choices influence world view
- texts represent a rhetorical embodiment of world view
- texts have a preferred or dominant reading
- texts involve written material that is author originated and guided and subsequently reader activated and oriented
- textual pragmatics is the examination of the interaction of the above phenomena

This list represents ideas from a number of sources and authors and is intended to give a general feel for the importance that language plays in molding and perpetuating an *ontology* held by an institutional community (Aronoff & Rees-Miller, 2001; Bulhof, 1992; Cherwitz, 1986; Coulmas, 1994; Lappin, 1996; Cooper, 1989; Grace, 1987).

The study of language, or more specifically, the study of written language (i.e. texts) within the aviation community is one way of uncovering and getting a glimpse of the *ontology* that informs concepts of aviation safety. The assumption of this project is that by studying selected aviation safety texts, generalizations about underlying safety beliefs can be postulated that represent an overall view or frame of reference concerning the reality of aircraft safety. This

overall view is referred to as an *ontology* because it involves fundamental concepts relating to the reality of aircraft safety. What exactly do we mean when we say that an aircraft is “safe” to fly? Is it a tangible and real state of being? Is it a feeling or emotion held regarding the situation? I believe that the language used within the aviation safety community presents a very definite and definable view of aviation safety. The purpose of this project to examine a sampling of written aviation safety texts and to offer an interpretation of the underlying assumptions and beliefs (i.e. ontology) contained in these texts.

### **The Ontology of Aviation Safety**

The preceding paragraphs have alluded to some of the basic tenets that inform the *ontology* that is hypothesized in this project. A more in-depth treatment will show that the *ontology* that guides aviation safety policy is firmly rooted in the functionalist paradigm of the twentieth century, and is responsible for the reification/objectification of the concept of aviation safety. Other verbs besides *to reify* and *to objectify* (i.e. to hypostatize, etc.) might have been selected. However, *to reify* which means “to regard or treat an abstraction as if it had concrete or material existence” (Webster’s Collegiate Dictionary) is very relevant. Reifying the concept of safety presents the ideal of safety as something real and tangible. Likewise, *to objectify* which means “to treat as an object or cause to have objective reality” (Webster’s Collegiate Dictionary) is a useful concept that is applicable. The consequences of this type of thinking can be profound. By buying into the concept that “safe” is a state of being, the intellectual basis is established for a number of important premises. For example, this type of thinking is the basis for concluding that all accidents are preventable. Why couldn’t all accidents be prevented if “safe” is something real and achievable? It would appear that prevention is just a matter of proper attention and diligence. In a way, this aspect of the aviation safety *ontology* sets itself up for failure because once the concept of safety is objectified/reified the expectation is to be “safe”. Consequently, an aircraft accident is viewed as a failure of the system.

This type of thinking is diametrically opposed to, for example, a “risk assessment” approach to safety. Risk assessment is built upon a more subjective ontology that views

accidents as inevitable and safety as a man-made ideal. Of course, the concept of safety within a risk assessment framework can be objectified/reified. Bench marks can be set that refer to real and objective states of being such as an acceptable number of mishaps or near misses as being safe, but the intellectual basis still recognizes accidents as inevitable. The goal of risk assessment is to reduce accidents to an acceptable level that is defined by an intellectual construct. This is not the type of thinking that forms the intellectual basis for present concepts of aviation safety in this country.

As stated above the *ontology* of aviation safety rests upon an objectified/reified view of safety that is firmly rooted within the scientific paradigm. Without question science is an intricate part of aviation safety and aircraft accident investigations. The advances across the board in technology and computer applications within the past fifty years have greatly assisted the aviation community in determining the causes of aircraft accidents and subsequently coming up with preventive solutions. Additionally, from an intellectual perspective it could be argued that these technological advances have drawn the *ontology* of aviation safety more closely to the scientific paradigm. In fact, today science and aviation safety are almost synonymous, or at least inseparable and dependent within our thought process relating to aviation safety. Whenever one conjures up thoughts of airplanes or aviation safety the aura of science is always present.

This is understandable because aviation safety, at least from the public's perspective, is "retro" in nature. By this I mean that it is rearward looking. The public's awareness of aviation safety is event driven, usually with a major aircraft accident acting as the catalyst. If one steps back and observes how a major aircraft accident investigation is conducted, the process is very much akin to a large scientific experiment. The crash site is cordoned off and every piece and bit of crash debris is carefully plotted and measured before being moved. The site is analyzed with respect to impact points of various aircraft parts and the direction and distances that they traveled. Once spatial relationships are established and the crash site is completely photographed, analyzed and reanalyzed, only then are individual parts and pieces of material relocated to a controlled site where they are reassembled for further evaluation.

As the reconstruction of the crashed aircraft begins, technology in every imaginable form is used to solve the "mystery" of the crash. It is absolutely amazing what can be

determined from the analysis of one little piece of charred metal. For example, engineers can determine from analyzing one stator blade from a crashed jet engine the operating temperature of the engine at the time of impact, how fast (i.e. rpms) the engine was operating and was it operating normally. Computer technology has been especially helpful in reconstructing the events leading to a crash of an aircraft. Through computer modeling and computer imagining visual images can be generated of what happens to an airplane when for example the rudder separates from the vertical stabilizer.

The point is that a philosophy of science and the scientific method are strong intellectual forces that mold our concepts of aviation in general and aviation safety in particular. If one looks past the technology involved and focuses on the fundamental nature of how we think about aviation safety the link to science should be apparent. The inductive reasoning, the canonization of events, the focus on cause and effect, the reliance on empirical factors, and the list goes on. Unquestionably modern aviation as we know it today is a result of scientific thought. What does one envision when he/she thinks about space flight and a man walking on the moon? A good guess would be images of engineers in white coats with slide rules sticking out of their pockets (or if you are younger calculators) in a white sterile room filled with an array of computers. This is a fairly accurate characterization of the scene in launch control at the Kennedy Space Center during an active period.

Before going any further one point needs clarification. This project is not about making a judgement or critique concerning the value of science or the scientific method. That is better left to the Postmodernists. There are many acclaimed scholars such as Michael Polanyi, Thomas Kuhn, Karl Popper, and Steve Woolgar just to mention a few whose works offer critiques of science and the scientific method. The point of this project is to present the argument that science and the philosophy of science are intricate parts of an *ontology* that informs aviation safety within this country. The literature of aviation safety rarely if ever examines the fundamental assumptions and beliefs that direct and guide dialogue within the field. The hypothesis presented here is that aviation safety rests upon an *ontology* that is heavily informed by a philosophy of science. No doubt this *ontology* has served the aviation community well over the years. The goal here is not to evaluate or pass judgement on the substance of the *ontology*,

but to argue that one does exist and to identify some of the major ideas that inform this *ontology*. The thrust is thus descriptive and not normative. However, the particular thought patterns promulgated by the *ontology* of aviation safety will be examined along with some perceived consequences.

Science and the scientific method have been responsible for the great advances in aviation during the twentieth century. In fact aviation has been at the leading edge of science and one of the fields where science draws from many specialties. It is not hard to understand how we as a public have subconsciously made the intellectual leap to perceiving safety as being scientific. If aviation and manned flight is indeed a product of science then the mind is conditioned to think in these terms and anything associated with aviation and flight must be perceived as science. As is known and promulgated by the scientific community science deals with what is “real” in the world. Science is demarcated from non-science in that it is concerned with the laws of nature. The terms “natural science” and “social science” are often used to distinguish the concepts.

In fact, the ontology of natural science is predicated on certain very basic or *a priori* (knowledge that is justified independently of any sensory experience) assumptions. Much science assumes the existence of laws of nature and that these laws or patterns exhibit a logical relationship. Consequently, it is through logical reasoning that one can understand the laws of nature. Another *a priori* assumption is that knowledge of the laws of nature can be categorized. Types and classifications of phenomena are part of the natural world. Perhaps the most important assumption is that man actually has the ability to comprehend the mysteries of nature. It is the *a priori* assumptions of the scientific community that postmodernists take great delight in challenging. This project has no stake in this debate other than to show the powerful influence of the philosophy of science in aviation and how it has helped to reify/objectify the concept of safety within the aviation industry. Part of the *ontology* of aviation safety is the core belief that safety is something that is real and tangible that is driven by science.

## Methodology

There are a number of methodologies that could possibly be used to uncover the ontological premises of aviation safety; however, hermeneutical interpretation was chosen for its flexibility and qualitative orientation. Hermeneutics originally developed within the Catholic Church following the Reformation. It was a method used by Jesuit priests to determine the true meaning of the Holy Scriptures. The process involved a lengthy and critical examination of the Scriptures to extract their true meaning. Over time the concept of hermeneutics has grown and expanded into three generally recognized fields. There is hermeneutics as a philosophy, hermeneutics as a social critique, and hermeneutics as a methodology. It is hermeneutics as a methodology that will be used in this project to examine the written texts of documents on aviation safety in an attempt to identify a shared ontological base within the aviation safety community.

The methodology of hermeneutics itself has a number of different interpretations and applications. Friedrich Schleiermacher (1768-1834) is given credit for developing a generalized hermeneutical method acceptable for the interpretation of any written texts and is known as the father of modern hermeneutics. Eventually, the concept of “texts” itself was expanded to include much more than written texts. Today, rituals, artifacts, myths, or just about anything produced by a society could conceivably be defined as “texts”. However, the texts examined for this project will only be selected written texts of the aviation safety community.

There are a number of aviation documents and written text that I believe hold promise for analysis. There is a particular language that is used in the congressional testimony of key aviation officials, in the mission statements of various federal aviation agencies, in aircraft accident reports, and in press releases. An expanded list would include: the enabling legislation, agency mission statements, presidential commission reports, major aircraft accident reports, congressional testimony, speeches of key agency officials, and agency press releases. This list is not exhaustive by any means, and merely offers some examples.

Even within the narrowed field of written texts there are various professional opinions of just what hermeneutics should be interpreting. What one might call hermeneutical traditionalists

believe that the proper use of hermeneutics is to extract the author's original intent from the text. Others view texts as more of a dialogue or discourse where both the sender (author) and the receiver (reader) contribute to the meaning of a text. This view holds that the text represents much more than what was intended by the author. This is somewhat similar to views concerning the interpretation of the Constitution of the United States. Some believe that the meaning should be derived solely from the intentions of the founding fathers while others take a much more pragmatic or conditioned approach. The approach taken for this project is an expanded interpretation that looks at the texts of aviation safety as representing much more than the intentions of the author. The idea is that the aviation safety texts go beyond the intentions of their authors and really encompass a specific way of intellectualizing aviation safety (i.e. ontology).

The status and condition of the interpreter is another area that needs to be clarified. In traditional hermeneutics where the original intent of the author of a text is of prime importance, the ideal interpreter should be detached from the text and a "neutral" entity. The competing strain of hermeneutics, and the one to which I subscribe, views pre-knowledge of the text as essential for a valid interpretation. Schökel refers to this as pre-comprehension and goes on to say: "This goes against the ideal of the reader's neutrality, but is based on the reality of experience. When the reader begins to read, there exists a previous relationship of interest. The reader does not come to the text as a neutral subject approaching an inert object. The text is not simply text, but rather text towards the reader. They are two poles in the dialogue which develops comprehension" (Schökel, 1998). Followers of this school of hermeneutic thought contend that there is no fixed meaning in a text; meaning is only acquired through reading. Since there is no fixed meaning in texts and each reader brings knowledge and assumptions to the text it would follow that the more informed a reader is concerning the subject the richer the interpretation. I hope that this is true because I bring thirty plus years flying experience and pre-comprehension to this project.

Another important consideration (in addition to defining concepts of text and interpreter status) in the methodological framework of hermeneutical interpretation is establishing the criteria for interpretation. Hermeneutical interpretation is not an exact science, but rather a

subjective, reflective, and reflexive endeavor. However, as G. B. Madison states: “The notion that one can “test” interpretations and subject them to scrutiny in light of the relevant evidence such that objective conclusions can be reached is a purely utopian notion. There can be no *science* of interpretation. This however, does not mean that interpretation cannot be a rigorous (if not exact) discipline, an art in the proper sense of the term, and that one cannot rationally *evaluate* interpretations” (Madison, 1988). Postulating a hermeneutical interpretation is like presenting a case to a jury. The author is trying to convince the audience to accept his version of the story and his success will depend on how well the case was presented. The credibility of the case in turn depends to a large degree on the intellectual criteria used to arrive at a particular interpretation.

Even though there are no universally accepted guidelines for hermeneutic interpretation it is absolutely critical that practitioners of hermeneutic interpretation establish and explain the principles that will guide their interpretive efforts. Just because hermeneutic interpretation is not an exact science does not mean that it cannot be structured and follow good research discipline. The credibility and acceptance of an interpretation will depend in part on convincing the audience of the intellectual integrity of the work. Interpretations should not be haphazard and idiosyncratic, but rather well thought out and guided by principles of interpretation that elicit confidence. To that end, there are a number of suggestions in the literature.

For example G. B. Madison lists coherence, comprehensiveness, penetration, thoroughness, appropriateness, contextuality, agreement, suggestiveness, and potential as possible guidelines for an interpretation (Madison, 1988). Joyce A. Walker on the other hand suggests five criteria: “the interpretation must be *wide*, the interpretation must be *deep*, the interpretation must be *contextual*, the interpretation must be *connected*, and the interpretation must be *authentic*” (Walker, 1996). In an article entitled Evolving Guidelines for Publication of Qualitative Research Studies in Psychology and Related Fields seven guidelines are presented as being especially pertinent to qualitative research and include: “owning one’s perspective, situating the sample, grounding in examples, providing credibility checks, coherence, accomplishing general *visa*. specific research tasks, and resonating with readers” (Elliott, Fischer, & Rennie, 1999). The specific criteria for this project will be covered in detail in the

chapter addressing research design.

However in general terms there are a number of stylistic or rhetorical variables upon which to base an interpretation of text. In terms of complexity, vocabulary is probably one of the simpler things to look at. Things such as word counts, exceptional words, key words, and ultimate terms (i.e. god, devil, and charismatic) are perhaps classic examples of vocabulary analysis. The extent of vocabulary used can also be a variable. For example TTR (type-token-ratio) is one method used to assess vocabulary (Aronoff & Rees-Miller, 2001; Lappin, 1996). In this case the number of different words (types) is measured against the total number of words (token) as an expression of the expanse of vocabulary. Another important aspect of vocabulary is “silences” which looks at words that are intentionally left out of a text.

Moving up the scale of variables in terms of complexity and subjectivity we encounter semantics which is concerned with the implied meanings of words and phrases. Semantics should prove enlightening when we examine the implied meaning of aviation safety terms such as “safe” and the ontological base that gives meaning to these key words. The analysis of tropes, which is a collective term used in literary circles to denote figures of speech such as metaphor, allegory, etc., is also a little more subjective than an analysis of basic vocabulary and holds promise for the interpretation of aviation safety texts (Woodson, 1979). An even higher order of textual analysis is concerned with rhetorical devices such as argument type (genus & definition, cause & effect, authority & testimony, etc.), rhetorical patterns ( general/particular, problem/solution, etc.), and genre which identifies a constellation of stylistic features peculiar to a text (Corbett & Connors, 1999). This list is not exhaustive by any means, but is intended to give an idea of the features and devices that will be used to analyze aviation safety texts. In summary, even though the term hermeneutics is not associated with the forerunners of social science research methodologies, there is a growing literature concerned with the hermeneutical interpretation of text. If approached using the rigor of disciplined research and guided by solid principles of inquiry I am hopeful that a hermeneutical interpretation of aviation safety texts will support the hypothesis of this project.

## Summary

The hypothesis of this project is that an *ontology* exists within the aviation safety community that acts as a powerful influence on the way Americans think about aviation safety. The basic premises and assumptions that inform this *ontology* also guide and channel dialogue and discussion about aviation safety. This being said, then the primary purpose of this project is to identify the main tenets of the *ontology* that underwrites the aviation safety community. The approach is qualitative and will utilize a methodology derived from the concepts of hermeneutics as it applies to the interpretation of written texts. The end goal is to present a convincing argument that an *ontology* does exist within the aviation community, and to layout its core assumptions and beliefs.

## CHAPTER II

### LITERATURE REVIEW

#### THEORY

The idea of an *ontology* which is particular to aviation safety and that guides public discourse concerning aircraft safety, and in most cases dictates approaches to problems, has no precedence in either aviation safety or scholarly literature. No one has ever acknowledged the existence of an aviation safety *ontology*, or questioned the basic belief system and shared public perceptions that drive the relentless effort to make the skies safer. Yet, an *ontology* may exist that springs from a century long quest to make airplanes fly faster, higher, farther, cheaper, with more people, and at the same time safer than ever before.

The aviation safety *ontology* is rooted in the functionalist and scientific paradigm of the modern world. After all, flight is the ultimate challenge that pits man and his technology against the natural environment. Flying (to include space travel) more than any other human endeavor has captured man's imagination and rides on the crest of technology. Flying is the one field that most vividly represents man's efforts to assimilate and integrate leading-edge technology and knowledge into something practical. However, advances in aviation rest upon a fragile base of risk perception. As a result, the administration of aviation needs to create a perception of "safe" for a technology that is fundamentally and inescapably "unsafe".

The ideas and assumptions that channel perceptions of aviation safety reside predominately at a subconscious level. It is not so much that they are taken for granted, but rather something much deeper, which is the reason for using the term *ontology*. There is considerable literature within the fields of public administration, political science, and sociology focusing on organizational behavior that can be used as a conceptual framework for exploring the concept of an *ontology* of aviation safety. For example, the literatures of *institutionalism*,

*organizational culture, epistemic communities, policy/ issue networks, policy communities, discourse communities, sub-governments, sub-systems and advocacy coalitions* all provide key notions necessary for building the conceptual framework that supports the premise that an identifiable aviation safety *ontology* exists.

The concept of institutionalism is especially important because it provides the perspective for looking at organizations as more than structured rationality. It allows one to conceive of organizations as more than a collection of individuals, and instead to view an organization as taking on a “life” of its own; something that is beyond functional rationality. Institutions conjure up ideas of value systems, traditions, and a whole array of normalizing mechanisms to include organizational culture, all of which go beyond and differ from functionality, and formal rationality. The concept of organizational culture is important because it is similar to the concept of an *ontology* and by some definitions shares certain attributes, but in fact is something quite different. For this reason the literature of organizational culture is dealt with in some detail in order to delineate the two concepts and establish their differences. The premise of this project is that an institution can have both a culture and an *ontology*, and though they are related, they are not the same thing. However, the interest here is not with individual organizational cultures, but rather with a common *ontology* shared by a number of institutions which comprise an “institutional field”.

In addition to institutionalism and organizational culture the other literatures mentioned above are important because they all share a common theme derived from two ingredients. First, there is a subject area of common interest (i.e. policy, issue, agenda, etc.) (Jordan, 1990). Second, there is some perception of grouping of the participating parties that involves common language and meaning (i.e. network, community, coalition, etc.) (Powell & DiMaggio, 1991; Cutting, 2000). The focused area of attention and a grouping of the interested parties are the key ingredients in these literatures that help provide the conceptual framework for the proposition presented. The premise offered is that within aviation safety there is indeed a network, coalition, or community of organizations/institutions whose purpose is to address issues, develop agendas and formulate policy for aviation safety administration that is based upon the perception that aviation is and can be kept “safe”. In addition to providing the essential conceptual framework

for this project, the literatures mentioned above also provide an ideal stepping off point for the idea of a common *ontology* shared within the “*institutional field*” of aviation safety. All of the network, community, and coalition literatures have become valuable tools in public policy analysis in their own right, but do not really address the notion of an “*ontology*”.

These literatures differ in that they are much more outcome and actor oriented. They tend as a general rule to be concerned with what policies are being formulated, how they are formulated, and by whom. In these approaches, actors and their power relationships are of prime concern. The intent of this literature review is to highlight the strengths of these theories and credit their contribution to the policy analysis field, but at the same time make it clear that they do not address the concept of a common *ontology* within a policy arena. The idea that there are basic assumptions and beliefs within a particular policy arena that are so fundamental that they are not talked about or even part of conscious thought, yet are powerful influences that frame the way the policy arena addresses issues, has yet to be specifically addressed.

The term I have chosen to label this set of fundamental beliefs is *ontology*. It is important to reiterate that this literature review is not intended as a traditional “straw-man” argument. On the contrary, the literatures to be reviewed all represent tremendous contributions to the field of policy analysis. The concept of an *ontology* is not offered as an alternative to these theories, but as another lens through which to analyze public policy. Understanding the *ontology* of a policy arena is another means to enhance one’s understanding of policy and administration. *Ontology* is foundational and would supplement the study of the more manifest and conscious influences that shape public policy. It is hoped that a review of the above mentioned literatures will make these points clear.

Aside from the above mentioned literatures and theories of public administration, political science, and sociology which provide the basis for the concept of a policy arena there is another field of literature necessary to complete the conceptual underpinnings of this project, and that is *linguistics*. Many think of linguistics in terms of phonetics, phonology, morphology and syntax and the so-called “science” side of language. These are fascinating sub-fields of linguistics; however, the more interpretive linguistic sub-fields of semantics, language pragmatics, discourse analysis and sociolinguistics are better suited to inform this project. These

sub-fields get at how meaning is derived from language, and that language is dynamic and constitutive. Language is not merely a collection of words with fixed meanings that are strung together according to a set of rules that represents or reflects a real world. In fact, the assumption of this project is that reality, at least to some degree, is socially constructed, and that language, to include texts (the written form of language), can be used to identify an *ontology* that undergirds the belief system and conception of reality of a particular policy arena. For this reason, portions of language literature will be presented following a review of the policy arena literature. But for now let us begin with a review of the literatures from which the concept of policy community/network is born.

As mentioned, the notion of “institution” and the concept of “institutionalism” are key. One of the basic premises and building blocks for my hypothesis is that organizations represent more than the mere aggregate sum of individual member behavior. This is a concept that all institutional theories share. The concept of institutions rests upon the view that organizational myths, norms, rules, procedures, and various associated narratives have a synergistic behavior-shaping effect on members of the organization. The processes of interaction within modern organizations produce an atmosphere, environment, or culture, that have a normalizing effect on its members. This is the core concept that defines all institutional theory.

The acknowledgment of ‘institutionalism’ as a separate and valid subject for academic scholarship is relatively new in terms of public administration theory. Philip Selznick’s 1957 book, Leadership in Administration: A Sociological Interpretation, is considered by many as a ground-breaking study that seriously goes about delineating the concept of an institution as opposed to that of an organization. Selznick was indeed a pioneer in distinguishing between organizations and institutions. Call it what you will, but Selznick’s thoughts on institutions flirt with the concept of “institutional ontologies”. As Selznick became more deeply involved in his research surrounding the Tennessee Valley Authority (TVA) it became apparent that there was an underlying belief system which greatly influenced authority and relationships within the organization. This prompted Selznick to embark upon the intellectual task of distinguishing between an organization and an institution because in his mind institutions represent more than mere organizational structure and procedure. Selznick sensed what I call an “institution

ontology”, but he did not specify it. It was an implicit part of an overall conceptualization of institutions that made them more than mere organizations.

However, the intellectual roots of the concept of institutionalism go much further back than Selznick’s work. For example Scott, one of the leading contemporary institutional scholars, traces the intellectual roots of institutionalism to the late 19<sup>th</sup> century. He states: “The earliest institutional arguments arose in Germany in the late 19<sup>th</sup> century as one byproduct of the famous *Methodenstreit*: the debate over scientific method” (Scott, 1995). Scott does an excellent job of laying out the early history of institutional theory in his book *Institutions and Organizations* (Scott, 1995). The specific and detailed history of institutional theory within the disciplines of political science, sociology, and economics are not particularly relevant to this project. However, it is worth noting that many later institutional scholars speak of “institutionalism” and “neo-institutionalism” as representing two separate streams of institutional theory. For an in-depth look at the distinctions see the introduction in New Institutionalism in Organizational Analysis edited by Powell and DiMaggio (Powell & DiMaggio, 1991).

“Neo-institutionalism” adds a different, but equally important dimension to the conceptual framework supporting this project. It should be noted that “neo” is not really so “neo”! Never the less, while “old” institutionalism concentrates on how institutions affect the values and behavior of individuals within a specific organization; neo-institutionalism goes outside the organization and looks at how the organization’s behavior is affected by other similar organizations. The concept of a “field” or “community” of organizations/institutions is a centerpiece of neo-institutionalism (DiMaggio & Powell, 1991). The thrust of this theory is that the so-called “institutional field” has a normalizing affect on individual organizations. In simple terms neo-institutionalism is group theory applied to organizations. Neo-institutionalism provides the conceptual framework that allows the aviation community which includes various organizations such as the Federal Aviation Administration (FAA), National Transportation and Safety Board (NTSB), Congressional sub-committees, and the commercial airline companies, just to mention a few, to be characterized as a field of institutions. The concept of a “field” or “community” of institutions is key to building the conceptual framework for this project.

The so-called “old institutionalism” focuses on the individual within an organization and

looks at how the institution affects individual behavior. This initial brand of institutionalism arose within the organizational theory arena as a challenge to behaviorism and the notion of rational choice. At the simplest level, rational choice theory is informed by the belief that humans are rational creatures that act to further their self-interest. Consequently, the assumption is that if one wants to understand organizational behavior one should look at individual behavior, because organizational behavior is nothing more than the aggregate of individual behavior according to rational choice theorist. Of course, within the scholarly literature their arguments are much more sophisticated and refined, but nevertheless they all can be traced to the basic concept of rational choice driven by self-interest.

Rational choice theory is mentioned in order to highlight the difference in perspective between rational choice theorists and institutional theorists. There are conceptual differences in how these two streams of theory approach and explain organizational behavior. It could be argued that these two strains of organizational theory act as bookends for an array of theory dealing with organizational behavior. Rational choice theory zeros in on the individual organizational member as an independent variable in analyzing organizational behavior. Conversely, institutionalism, specifically neo-institutionalism, focuses on the organization itself as an independent variable in analyzing its effect on individual behavior. It would be hard to deny that most individuals act in a rational manner in their own self interest; however, individual rationality and perceptions of self-interest are themselves products of an environment, culture and basic belief system (i.e. *ontology*).

Recognition of inherent theoretical limitations has prompted attempts to temper and clarify rational choice theory. Herbert Simon's seminal work that presented the concept of "bounded rationality" is one example (Simon, 1945/1976). According to Simon, individuals may be rational, but they never have access to complete information, if indeed there is such a thing. Individual rationality is restricted or bounded by individual and environmental factors. For example, "Garbage Can" theory of decision making rejects a stark rational choice approach to organizational behavior. The "Garbage Can" approach (Cohen, March, & Olsen, 1972) does not attack rational choice theory philosophically, but rather states that it is unrealistic in its purist interpretation. Individuals may be rational and have a propensity to act in their self-interest, but

the world that they live in dictates the options that are available. Basically, garbage can theory suggests that organizational decisions are a result of problems, solutions and participants coming together in a somewhat random fashion. These three variables (problems, solutions, participants) flow into and out of the policy arena (garbage can) and link up as opportunity permits. The “luck of the draw” determines which problems present themselves at a particular time, and which participants and solutions are available. Rationality is involved, but only as it applies to a very limited playing field.

Rational Choice theory has been presented in considerable depth in order to contrast its thinking to that of institutionalism, and to show how institutionalism represents an alternative way of thinking about organizational behavior. This is not to say that the individual is not important in institutional theory, but rather that the individual is viewed more as a dependent variable than an independent variable. These distinctions within the concepts of institutionalism are absolutely essential to the conceptual framework needed to support the idea of a common *ontology* within a professional community (i.e. aviation safety) and its individual organizations (i.e. FAA, NTSB, etc.). Therefore, “old institutionalism” and “neo-institutionalism” form the basis for the *ontology* concept. Much of the earlier institutional writing (i.e. “old institutionalism”) focuses on how organizational rules, rituals, procedures, etc. have a normalizing affect on individual behavior within organizations ( Merton, 1940/57; March & Simon, 1958; Parsons, 1956/60; Selznick, 1949; Gouldner, 1954). I would include in the above list “institutional ontology” as an important influencing norm that affects individual behavior. The contribution of the “old institutionalism” literature is to explain the effect that institutional “norms” have on individual behavior within an organization. My contention is that institutional *ontology* is an important influencing norm that needs to be identified and singled out for consideration in the study of institutions.

The basic concept of institutionalism is not challenged in this project; on the contrary, the purpose of this project is to push the boundaries of this thinking even further. Much of the earlier institutional writing looked at the normalizing affect that organizations had on their members. These “norms”, if you will, were organizational rules, rituals, procedures, narratives, myths, and similar phenomena. This type of thinking has come a long way and contributes

immensely to concepts of organizational behavior. The contention of this dissertation is that these “norms” (i.e. rules, narratives, myths, etc.) are derived from something that may be less manifest than culture, but more powerful and fundamental (i.e. an “ontology” shared among a “community” or “field” of organizations/institutions). Furthermore, the contention is that this *ontology* can be identified through an in depth examination of written text within the aviation institutional field.

Another important and rich literature within the realm of organizational studies is the concept of organizational culture. As suggested earlier, the concepts of institutions and institutionalism are very implicit in the notion of organizational culture. However, organizational culture might be part of and similar to what I would term organizational *ontology*, but it is not the same thing. I distinguish between *ontology* and culture for the same reasons presented within the sociology and philosophy disciplines. The most notable distinguishing characteristic is that culture is more manifest, recognized and acknowledged. It is something that is talked about and perpetuated at a conscious level. Conversely, the basic beliefs which comprise one’s *ontology* are rarely consciously contemplated, and if contemplated, are seldom openly discussed. There is indeed a marked difference between the concept of “culture” and that of “ontology”.

A convincing example can be found in the military! Most people acknowledge and talk about a “military culture”. The ideas of discipline, professionalism, military bearing, and physical fitness are key concepts for the military culture. For example, the pre-commissioning process within the United States Air Force is structured and focused on instilling core values into the new cadets. Military members outwardly perpetuate these values by wearing a specific uniform and performing rituals unique to the military. Gary Wamsley’s intriguing study of Air Force officer candidate socialization highlights the key values instilled during the socialization process. In his words:

“The fundamental values of the military subculture are: (1) acceptance of all-pervasive hierarchy and deference patterns; (2) extreme emphasis on dress, bearing, and grooming; (3) specialized vocabulary; (4) emphasis on honor, integrity, and professional responsibility; (5) emphasis on brotherhood; (6) fighter spirit marked by aggressive enthusiasm; (7) special reverence for history and traditions; (8) social proximity for dependents.” (Wamsley, AJS, Vol 78, No 2).

These values are explicit and emphatic (ask any cadet). They are consciously woven into the very fabric of everyday military life. Organizational *ontology*, on the other hand, is rarely if ever acknowledged and discussed. It resides at a deeper level, and itself provides the foundation for a culture. Cultures, for the most part, are centered on a conscious value system that provides scope and definition.

The roots of the concept of organizational culture go a good distance back. Organizational culture may not have been addressed specifically, but during the early years of the twentieth century interest in group behavior began to surface. Robert de Board credits several writers of this time period from many different cultures, countries and disciplines with providing the philosophical foundations for the literature that would eventually become labeled organizational culture (de Board 1978). Many of these intellectual pioneers dealt with, or touched upon the concept of organizational culture in their work. Max Weber, a prime example, perhaps best known for developing the concept of “bureaucracy” wrote a book titled *The Protestant Ethic and the Spirit of Capitalism* (Weber 1930) which examined the impact of Protestant beliefs on capitalism in America and Western Europe. Kurt Lewin, Sigmund Freud, D. F. W. Taylor, and Henri Fayol are other examples offered by de Board as people whose works represent early studies in group behavior which showed a keen interest in individual motivation within a group environment (de Board 1978). As early as the 50s the topic of organizational culture began to appear in books, but not in any significant manner (Jaques 1951, Whyte 1956).

Perhaps the real push to solidify and define the concept of organizational culture came in the latter half of the twentieth century; primarily as a result of Japanese commercial success in the world market. Many say that a somewhat obscure and unknown American, William Deming, was responsible in a round about way, for the intense interest in organizational culture that began to emerge in the late 70s and early 80s. Deming, who obviously did not remain obscure and unknown, was recruited in the late 1950s to consult with Japanese industry regarding economic productivity. Deming applied statistical analysis as a tool to assist managers and workers to help identify means to enhance production. Deming’s techniques fit well with the Japanese corporate management culture, and the rest is history so to speak. The intellectual importation of these

ideas and techniques to the United States formed the basis for the Total Quality Management (TQM) movement that swept corporate America in the 70s and 80s. Even within the military the United States Air Force, especially Air Combat Command (ACC), jumped on the TQM bandwagon. TQM was one of the more notable manifestations of the organizational/corporate culture revelation.

The resulting organizational culture literature, which began to blossom in the late 1970s and early 1980s, was stimulated partially by the keen interest of corporate America in the success of Japanese companies. At that time Japanese companies were enjoying tremendous success which many attributed to their unique brand of corporate culture. In an attempt to emulate the Japanese model, a number of books appeared on the market. Some of the best known would have to include *Theory Z* (Ouchi, 1981), *The Art of Japanese Management* (Pascale and Athos, 1981), and of course *In Search of Excellence* (Peters and Waterman, 1982). Many would say that the commercial success of these books acted as a shot in the arm for academic research and interest in the concept of organizational culture. There is probably some truth here, but in reality the concept of organizational culture as a separate topic for serious scholarship and research grew out of earlier work focused on organizational climate that began to emerge in the 1940s and 1950s (Reichers & Schneider 1990).

At any rate it is safe to say that as a result of Japanese economic success, commercial and academic interest in organizational/corporate culture was sparked in the late 1970s and early 1980s. Arnon Reichers and Benjamin Schneider provide an excellent chronology of the intellectual history of the concepts of organizational climate and organizational culture in their chapter entitled “Climate and Culture: An Evolution of Constructs” in Organizational Climate and Culture (Schneider 1990). According to these scholars organizational climate was the earlier construct with works/articles beginning to be published in the 1950s. The construct of organizational culture as separate and distinct from organizational climate came later and began to surface in works/articles in the 1980s. Defining and delineating the intellectual boundaries of organizational climate and organizational culture appears to be an ongoing endeavor with a wide array of interpretations. Even today there is academic sparring to defend the conceptual boundaries of organizational climate as opposed to organizational culture (Schneider 2000).

Some see climate and culture as two distinct and non-overlapping entities (Trice & Beyer 1993), others see the concepts as almost completely synonymous (Katz & Kahn 1978), while a majority probably acknowledges the overlap of the two concepts.

For the sake of clarity let us assume that climate and culture are two separate and distinct constructs and briefly outline how one might differentiate the two. To begin, with climate appears to be the narrower of the two constructs. Climate is usually spoken of in terms of a specific goal within an organization. For example, management might try to create a better climate for service, or a better climate for employee feedback. In this sense climate has a tendency to be viewed more as a variable within an organization, and something that can be manipulated to achieve an end. Schneider and Rentsch put it this way “climate is shared perceptions of organizational policies, practices, and procedures, both formal and informal. “Climate is a molar concept that is indicative of the organization’s goals and appropriate means to goal attainment” (Schneider & Rentsch 1988). As a result, research regarding climate within organizations has tended to be more focused and results oriented. Both qualitative and quantitative methods have been used, but the bent is towards survey research with the goal of identifying specific attitudes conducive to particular climates within the organization.

The term organizational culture, on the other hand, is used to convey something much broader. Within the literature, definitions of organizational culture vary widely to say the least and there is no “one” accepted definition. Joanne Martin’s book Organizational Culture: Mapping the Terrain is an excellent source for comparing the various definitions of organizational culture (Martin 2002). In her book Martin compiled a table that presents many of the definitions developed by leading organizational culture scholars. It becomes quite evident that there is little agreement concerning the depth of the concept of organizational culture or the words best suited to conjure up a mental construct. However there are certain words and concepts that are fairly common within the literature. The concept of a “set of understandings” is one such phrase that can found in definitions of organizational culture (Sathe, 1985; Louis, 1985). “Shared meanings” is another commonly used reference (Louis, 1985; Sergiovanni & Corbally, 1984; Martin, 2000). “Rules of behavior or rules of social interaction” is yet another concept referred to in definitions of organizational culture (Mills, 1988; Schall, 1983). “Beliefs

and values” offer a somewhat different orientation within definitions of organizational culture.

Other frequently used words and phrases found in definitions of organizational culture include *norms*, *rituals*, *common frame of reference*, *common orientation*, and the list could go on and on. However, of all the organizational culture scholars perhaps E. Schein offers the most comprehensive definition of organizational culture. Parts of his definition come closest to the concept of an *ontology*, and for that reason it is worth talking about. Schein envisions organizational cultures as having three levels. The first level he calls artifacts and creations. This is the most visible level and would include things such as technology, art and certain behavior patterns. The next level is that of values. Schein states that values involve a “sense of what ‘ought’ to be, as distinct from what is” (Schein, 1985). The last level is that of basic assumptions. Basic assumptions according to Schein concern the nature of reality, time, and space; the nature of human nature; the nature of human activity; and the nature of human relationships. Schein’s basic assumptions included in the last level of his definition touch upon the concept of *ontology* presented in this project. Conversely, much of the organizational culture literature is concerned with the more visible and conscious traits of organizational culture. In a way, organizational cultures should be considered as the manifestations of an *ontology*. At least that is the line of reasoning presented in this project.

Another important distinguishing factor is the possibility of having many different organizational cultures within a community of organizations, yet all could still share a common *ontology*. Organizational cultures represent something different and do not compete with the concept of *ontology*, even though they are related and compatible. For example, the aviation community includes such organizations as the FAA, The NTSB, The Airline Pilots Association, and numerous other governmental, professional, and commercial organizations that could have quite different and distinct cultures. The FAA and NTSB are government bureaucracies, and as such, probably manifest organizational cultures quite different from say a non-profit lobbying organization like the Airline Pilots Association, or from a commercial concern like Boeing Aircraft Corporation, which are also a part of the aviation institutional field.

I have gone to great lengths to examine the differences inherent in the concepts of an “ontology” and that of an organizational “culture”. Culture is the more familiar concept. Yet, I

hope to show that organizations within the aviation institutional field can have diverse cultures, and at the same time share a common *ontology* that dictates discourse boundaries and courses of action. In essence, organizational cultures are by definition creations of a particular organization, and consequently have an introspective focus. An *ontology*, on the other hand, could and often times does stretch across an entire industry or policy arena. Organizational cultures and organizational ontologies are not the same thing, and additionally must not be conceived as being mutually exclusive. Like all of the other literatures reviewed in this chapter they represent mental constructs that portray distinct aspects of an organization. A considerable amount of time has been devoted to reviewing the literatures of *institutionalism* and *organizational culture* because they provide key foundational concepts for the idea of an institutional field *ontology*. It was also important to show that culture and *ontology* are separate entities.

Another emerging and promising concept is that of “epistemic community”. In this instance, the community is formed by reference to a shared knowledge base and not defined organizationally as with institutionalism (Crane, 1972, Evan, 1981, Haas, 1990). Michel Foucault is generally given credit for inventing the term “epistemic” in The Order of Things (Foucault, 1973) even though his sense of the term was more ideologically oriented. Even before Foucault’s coinage of the term the concept was beginning to emerge. In Thomas Kuhn’s seminal work Structure of Scientific Revolutions he talks of a “scientific community” that shares a “paradigm” (Kuhn, 1970). In fact, the term ‘epistemic community’ has often been used in a narrower vane to refer to scientific communities. However, Peter M. Hass has developed a broader sense of the concept of epistemic community. Hass is recognized as one of the pioneers in expanding and crystallizing the concept of epistemic community, especially as it applies to the international arena.

Hass defined epistemic community as “a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy relevant knowledge within that domain or issue-area.” (Hass, 1992). He goes on to say that these professionals have “(1) a shared set of normative and principled beliefs, which provide a value-based rationale for the social action of community members; (2) shared causal beliefs, which are derived from their analysis of practices leading or contributing to a central set of problems in

their domain and which then serve as the basis for elucidating the multiple linkages between possible policy actions and desired outcomes; (3) shared notions of validity – that is, intersubjective, internally defined criteria for weighing and validating knowledge in the domain of their expertise; and (4) a common policy enterprise – that is, a set of common practices associated with a set of problems to which their professional competence is directed, presumably out of the conviction that human welfare will be enhanced as a consequence.”(Hass,1992). Interest in the concept continues to grow. Craig Thomas out of UC Berkeley who defines epistemic community as “like –minded networks of professionals whose authoritative claim to consensual knowledge provides them with a unique source of power in decision-making processes” has focused on testing epistemic community theory at the domestic level (Thomas, 1997).

In Hugh Miller and Charles Fox’s article *The Epistemic Community* they argue “that knowledge is responsive to the culture in which it is embedded... knowledge building, in other words, depends on the background and interests of the epistemic community that is generating knowledge” (Miller & Fox, 2001). This particular line of reasoning is relevant because my proposed hypothesis will argue that epistemic communities share a common *ontology*, and that in fact, *ontology* is precursory to and precedes knowledge building. The aviation community can certainly be portrayed as an epistemic community. It is a very technical field that has developed a professional vocabulary required to converse intelligently within the epistemic community, which can and often does differ from the dialogue of broader discourse. For example, when the Director of FAA has a conversation with the Chairman of the NTSB it is likely that the terms and language used are quite different from the language used in a press conference. The same would hold true for dialogue and discourse between the staffs of the two organizations. NASA is another good example because its internal communication is most likely much different from what is said in the public form.

The point to be made is that professional and interagency communication can be, and often is, much different from their public dialogue. However, epistemic community theory does not really address this issue. The theory of an epistemic community posits that professionals within the aviation community, because of their expertise and knowledge, enjoy a certain

deference; and consequently, power in structuring the discourse of aviation. The thesis presented here does not contest or compete with epistemic community theory, but rather makes the point that public discourse within the aviation community conforms to a particular *ontology* of basic beliefs that may or may not coincide with the ontologies of individuals or with the ontologies of certain organizations within the aviation community. Epistemic community theory looks at who has authority to speak within a knowledge arena which in turn ultimately determines what is said. In contrast, the argument presented here is that even an epistemic community rests upon a basic set of beliefs (i.e. ontology) which generate meaning from what is put forth. The aviation community may or may not be considered an epistemic community – which will remain a question for some other aspiring scholar. The task at hand is to identify the *ontology* that exists within the aviation community that drives public dialogue.

Network theory in general, is another useful strain of theory that is similar to and shares common intellectual ground with both institutionalism and epistemic community theory. Central to all three strains of theory is the notion of a cluster of organizations or groups that interact and have influence within a policy arena. However, network theory is more operationally and action oriented than either institutionalism or epistemic community theory. “In more concrete terms, networks include interagency cooperative ventures, intergovernmental program management structures, complex contracting arrays, and public-private partnerships” ( O’Toole 1997, 446). The United States is generally given credit for originating the concept of a policy network in the 1950s and 60s (Jordan, 1990). Scholars such as Leiper J. Freeman, Douglas Cater, H. Brinton Milward, and Gary Wamsley represent a sampling of prominent contributors to early policy network theory. Since that time policy network theory has attracted a considerable following in this country as well as Britain and Europe. In fact, as Guy Peters points out European scholars have taken the lead in developing policy network theory (Peters, 1998).

It is interesting to note that there are differences in how policy network theory is conceptualized on the different continents. David Marsh sees the American literature as emphasizing “the micro-level, dealing with personal relationships between key actors rather than structural relationships between institutions”, the British literature in contrast tends to place more emphasis on “the structural relationship between political institutions”, while much of the

European literature views policy networks “as being of much broader significance... not so much a new analytical perspective but rather a real change in the structure of the polity” (Marsh, 1998). The German literature in particular sees policy networks as filling a void between hierarchy and markets. What is important to the project of this dissertation is not so much any specific brand of policy network theory, but rather the policy network metaphor. Like the metaphors of “institutional fields” and “epistemic communities”, it supports the conceptual framework of a group of organizations/institutions that influence a particular policy arena. “Institutional fields”, “epistemic communities”, and “policy networks” all speak to the ideas of unity. What this project explores is the ontological base that cements or undergirds a particular field, community or network (i.e. aviation safety).

Under the general banner of network theory a number of more tightly defined concepts of networks fall. Within the literature one can find articles with titles such as *policy networks*, *policy communities*, *issue networks*, *discourse communities*, *sub-governments*, *advocacy coalitions*, and more. The differences can be subtle or more substantial depending upon the article. However, the differences that are typically identified are not particularly relevant to this project. What is important is the underlying conceptual framework shared by this kind of literature. The idea of a community, a network, or a coalition conjures up a mental image of a group, or more specifically, a group of individual entities drawn together for a common purpose. This project is grounded in the concept of aviation as a community, network, or coalition of institutions concerned with aviation. This community is drawn together by policy concerns and aviation issues. There is continual discourse within the community concerning advocating various positions. The aviation community can be seen as a policy community, an issue network, a discourse community, a sub-government, and an advocacy coalition. All of these concepts have been extremely useful in understanding organizational behavior and will continue to do so.

Although the idea of an *ontology* within an institutional field has never been presented in specific and explicit terms there is a rich body of work by various organizational/institutional scholars which serves as precedent. The idea of beliefs has been explored. These works deal with a variety of topics as noted above, but almost all allude to or have some reference to

ontological considerations. For example, the work of scholars such as Fox, Miller, Sabatier, Milward, and Wamsley, although not directly concerned with the ideal of a “professional ontology”, never the less soften the ground and prepare the way for such a concept.

Fox and Miller’s book Postmodern Public Administration (1995) is nothing less than a monumental ontological discourse, even though not billed as such. Charles Goodsell eloquently sums it up in the forward to their book:

“ In one sweep, they reject perhaps 90% of accepted public management doctrine as an orthodoxy that is intellectually bankrupt and democratically unacceptable. Then, in another sweep, they brush aside what they see as the leading competitors to the orthodoxy, constitutionalism (their label, not mine) and communitarianism. Next without missing a beat, they rush headlong into constructing a new theoretical position they call constructivism.”

When one speaks of “doctrine”, “orthodoxy”, and “theoretical positions” they step into the arena of belief. These are the types of words/adjectives that imply deep meaning and belief. Likewise, the term “ontology” suggests deep meaning and belief. Fox and Millers’ critique and subsequent new theoretical position in that respect have “ontology” written all over it.

The concept of “policy subsystems” as developed by both Milward and Wamsley separately (Milward, 1982, Wamsley, 1983) and collaboratively (Milward & Wamsley, 1985) were attempts to intellectually get their arms around the immense complexities of everyday life within a policy arena. In their own words, policy subsystems “are primarily an analytical construct imposed by the observer” (Milward & Wamsley, 1985). Nevertheless, it is an analytical construct that lays out common characteristics of policy subsystems and establishes possible rationales for inclusion or affiliation within the subsystem. It provides a framework for looking at a very complex subject.

For example, they expand on the concept of “networks” stating that: “the networks’ tools (which constitute the internally political economy) and normative structure are termed a ‘policy subsystem’”. (Milward & Wamsley, 1985) The ideal of a network that has a modus operandi (MO) guided by a normative structure has much in common with my vision of an “institutional

field”. In fact, they go on to say “policy subsystems are composed of institutions, organizations, groups, and individuals linked on the basis of shared and salient interests in a particular policy”. (Milward & Wamsley, 1985) These are key ideas upon which I build the concept of an “ontology” within an “institutional field”. The only thing the framework lacks is a sense of the depth and the conviction of ontological beliefs. Instead, they speak of “shared and salient interests”.

On a similar note, Sabatier developed the *Advocacy Coalition Framework* as a theory of policy process in conjunction with Jenkins-Smith (1988, 1993). In his own words: “ the advocacy coalition framework (ACF) focuses on the interaction of advocacy coalitions – each consisting of actors from a variety of institutions who share a set of policy beliefs – within a policy subsystem. Policy change is a function of both competition within the subsystem and events outside the subsystem.” (Sabatier, 1999). The ACF, as with the other literatures mentioned above, skirts and flirts with the ideal of an *ontology* within an institutional field, but comes up short in two respects.

First, these literatures do not go deep enough to capture the essence of an “ontology”. Sabatier’s ACF theory speaks of values, interests, and perceptions. He states: “Each of these actors (either individual or corporate) has potentially different values/interests, perceptions of the situation, and policy preferences.” (Sabatier, 1999) The concepts of interests, perceptions, and preferences are not on the same level of meaning and signification as those within the concept of an “ontology”. A commonly held “ontology” is the intellectual bedrock that forms an institutional field. Conversely; interests, perceptions, and preferences can, and most likely will, vary within an institutional field, but not their core “ontology”. Sabatier’s values, interests, perceptions, and preferences do not match the significance or permanence of an “ontology” and are much more transient.

Secondly, neither Sabatier’s ACF nor the other works mentioned focus on “core beliefs” as something worthy of independent treatment. Their interest in values is tied to or in conjunction with the study of policy. The position presented herein is that identifying and describing the “ontology” of an institutional field should be the primary and precursory object of study in policy analysis. The contention is that knowledge of and familiarity with the

“ontology” of an institutional field enhances policy analysis. It seems reasonable to assume that “ontology” would play a significant and fundamental role in establishing institutional organization, structure, habits, forms of communication, or any number of things important in policy analysis.

As seen from the sampling of scholars above there are any number of concepts that allude to ontological considerations, yet skirt the parameters of the concept of a core *ontology*. They fail to make the conceptual leap. This dissertation makes that conceptual leap by declaring: **that an institutional field (in this case the field of aviation) shares a common ontology**. Ontology in this sense is a set of deeply held fundamental beliefs that comprises the reality of those involved. The authors cited above and most of the work in our field concentrates on describing, analyzing, and explaining public administration. However, the concept of an *ontology* within an institutional field is not offered as a descriptive, analytical, or explanatory tool. *Ontology* is much more fundamental and definitive in nature. It is more properly utilized as a springboard to launch into the descriptive, analytical, and explanatory. *Ontology* provides the intellectual landscape that permits more accurate description, analysis, and explanation. The hypothesis here is that institutions and institutional communities develop *ontologies* which reflect perceived realities that frame and guide activity. Rules, rituals, narratives, and myths all have ontological roots that reside at a much deeper level in perceptions and assumptions of reality, and the task of this project is to examine the ontological roots of the aviation safety community.

What is new and different about this project is the contention that this community of aviation organizations/institutions shares an *ontology* (assumed and perceived reality). Public discourse within the community concerning aviation safety is based on their *ontology*. Thus, there is a set of basic beliefs (i.e. ontology) that structures the way the aviation community functions and talks publicly about aviation safety. The objective of the research conducted for this dissertation is to identify and describe the *ontology* that sets the tone for public discourse concerning aviation safety. The thesis of this dissertation does not contradict or challenge any of the existing organizational behavior theory. In fact, the literatures reviewed above provide the conceptual framework for posing the question ‘is there a particular “*ontology*” within the aviation community that drives public discourse and dialogue relevant to aviation safety’. The

answer presented herein is most emphatically yes.

## LANGUAGE

Furthermore, it is suggested that this *ontology* is manifested in language, and can be identified through examination of the written texts of the aviation community relating to aviation safety. For this reason, language is very important to the intellectual founding of this project. Semantics is particularly important because at its simplest level it looks at the meaning of words and phrases within a sentence. As Shalom Lappin states: “The meaning of a sentence in a language is, to a large extent, dependent upon the ways in which the words and phrases from which it is constructed can be related to situations in the world...a systematic correspondence between categories of expression in a language and types of entities in the world” (Lappin, 2001). Individual words and their connotations are important in aviation safety. The word safe is a perfect example. What is really meant when it is said that an airplane is “safe” to fly? Inescapably, it is a statement of an opinion, and no matter how “professional” the source of that opinion, it is still an opinion. Being “safe” and safety involve assessments of acceptable risks; however, within the aviation community the word safe and the concept of safety have been reified and objectified. The mind set engendered is that an airplane is either “safe” or “unsafe” to fly which implies a tangible condition. In this case words are important, and it is the contention of this project that they are indicative of a deeper and broader set of beliefs (i.e. ontology).

Linguistic pragmatics goes beyond semantics with its focus on the meaning of individual words and phrases within a sentence. It looks at the “relation between our knowledge of language and the way we use it, for words invariably convey much more than they mean... what does this apparent gap between language use and meaning tell us about language” (Kempson, 2001). Pragmatics focuses on communication and how it is achieved. Kempson uses a very simple conversation to demonstrate the concept of pragmatics as it relates to language and communication. The conversation is between two people and is extremely short. It goes as

follows:

A: “Can you cook?”

B: “I know how to put a kettle on” (Kempson, 2001).

There are only eleven words in the entire conversation, yet there is a wealth of information and communication that transpires in this short exchange. The answer to the question says a whole lot more than the words mean. One could surmise that the person answering is not a particularly good cook and probably has little interest in cooking. What’s more there is a certain attitude and air implicit in the answer. Pragmatics looks at the ability of language to communicate more than that contained in the strict meaning of the words.

Linguistic pragmatics will be a useful concept in examining the implicit meanings contained within the *ontology* of aviation safety that are communicated in the language of aviation safety. More specifically this project will attempt to identify the messages being communicated by the aviation safety community through various aviation written texts. It is my contention that certain words and phrases are used over and over again in aviation safety writings that have connotations and suggested meanings intended to communicate a particular way of looking at aviation safety. The overall hypothesis of this project, as mentioned earlier, is that the aviation safety community communicates certain messages and meanings that conform to a basic *ontology* and that these messages can be identified by an in depth analysis of selected written texts of the aviation safety community.

Another useful sub-field of linguistics is discourse analysis. Discourse analysis compliments and expands the approaches and focus of both semantics and pragmatics. While semantics looks at the meanings of words and phrases within sentences, and pragmatics looks at the meanings being communicated and processed in the brain, discourse analysis is concerned with the environment within which language takes place. According to Agnes He “Discourse analysis is concerned with the contexts in and the processes through which we use oral and written language to specific audiences, for specific purposes, in specific settings... discourse analysis seeks to describe and explain linguistic phenomena in terms of the affective, cognitive, situational, and cultural contexts” (He, 2001). Likewise, context is important when interpreting the texts of aviation safety. The variety of actors, the political climate and the history of aviation

all come together to define the context of aviation safety and contribute to a common *ontology* which underlies our approach to safety.

There is most certainly a discourse of aviation safety. Every time a major aircraft accident occurs the discourse is intensified. The public can witness a blow by blow account as the National Transportation & Safety Board (NTSB) accident investigation team deploys to the site. The Chairman of the NTSB usually makes various statements as the investigation progresses. The media supplements their “telling of the news” with analysis and opinions from various “aviation safety professionals”. At the conclusion of the on-site investigation the NTSB will usually hold a public hearing. At this time members from the Federal Aviation Administration (FAA) and industry officials will appear at the request of the NTSB chairman to answer technical and policy related questions. The end result is an official accident report assessing the cause(s) of the accident and providing recommendations or corrective action. The point is that there is a lively discourse within the aviation safety community during times of a major aircraft accident.

In fact, a discourse occurs at a less visible level on a daily basis within the aviation safety community throughout the year as policy is developed, regulations promulgated, recommendations acted upon, and testimony given to various congressional sub-committees. The day-to-day business of aviation safety involves a lot of different government agencies, the commercial airlines, aircraft companies, professional organizations, and other interested parties. The discourse is often intense and the stakes are high. For example, the decision to require a particular safety device, or to require a fleet of aircraft to be retrofitted or modified could cost millions or even billions of dollars. The emphasis of this project is that whatever differences reside at the operational level, there remains an underlying ontology that drives a particular concept and approach to aviation safety. Furthermore, I believe that this *ontology* can be identified by an in-depth examination of selected written texts representative of the overall discourse within the aviation safety community.

There is one other sub-field of linguistics that contributes to the over all conceptual framework of this project and that is sociolinguistics. Scholarship within this sub-field is diverse, but basically sociolinguistics is the study of how language is used in society. There is a micro-

macro distinction within the field with the micro taking on a more narrow approach. “Speech is socially emblematic in the sense that speakers by their choice of words, manner of pronunciation, and other stylistic features identify with others with whom they share social characteristics, such as socio-economic status, occupation, and education” (Coulmas, 2001). The notions of *choice of words* and *stylistic features* with occupational ties are useful in building the conceptual framework for an aviation safety *ontology*. There are certain words with specific connotations used over and over again with the aviation safety literature. Likewise the problem-solving style of writing is very prominent in the aviation safety texts.

Macro-sociolinguistics offers the concept of “speech community” which is similar to the “discourse community” literature in the disciplines of sociology and public administration. For my purposes the distinctions are not important and represent different ways of coming at the same thing. In the “Speech community” speech is used as an identifier. Those that exhibit a specified speech are included in the community. While within the “discourse community” discourse is defined by the community. What is important in both is the concept of speech or discourse as an identifying feature that results in a group or community of like thinkers/speakers.

In concluding, I would suggest that there is no specific literature that addresses the topic of this project. However, it should seem apparent that there is considerable literature needed to build the conceptual framework that supports the idea of an *aviation safety ontology*. The organizational behavior theory of public administration, political science, and sociology are absolutely essential to the intellectual founding of this project, especially the concept of an organizational/institutional community. The concept of institutional field, epistemic community, policy network, and discourse community all speak to the conceptual framework of this project. While organizational behavior theory helps describe the environment within which a specific *ontology* can exist, linguistic theory helps explain how language promulgates and perpetuates a particular *ontology* within a professional community.

All the reviewed literatures are essential for establishing the conceptual framework necessary to provide solid ground for the thesis of this dissertation. The concept of institutionalism and the idea of a “field” of institutions that are individually sensitive and responsive to “norms” of the entire field provide a conceptual doorway to the idea of a common

*ontology*. The idea of a “field” of institutions is complemented and supported by the stream of network theory within the literature. Network theory puts forth the idea of a community or network of organizations/institutions that engage in public discourse that are drawn together by policy and issue concerns. Epistemic community theory is built upon the same assumptions, but adds the dimension of authoritative knowledge. Finally, language is the glue that allows so many different concepts to come together and solidify in a conceptual framework. Language and the interpretation of language is implicit in all of these literatures. It is only through the use of language and the interpretation of language that an *ontology* within the aviation safety community can be identified and described.

## CHAPTER III

### RESEARCH DESIGN

The theoretical framework for this project is explained in some depth in the proceeding *problem statement* and *literature review* chapters which serve as a prelude for the *research design* chapter. However, the intellectual landscape needs to be further cultivated somewhat in preparation for the building of the research design. Research designs are not just plucked from thin air as ready-made templates for serious scholarship, but are predicated on some basic assumptions which in turn foster a particular research orientation. Therefore, to facilitate a better understanding of the research design used for this dissertation it might be helpful to chart the intellectual journey that led to this particular research design.

The belief held here is that the development of a research design is an evolutionary process. It begins with some very basic assumptions which philosophically support a particular research orientation, which in turn leads to a generalized research strategy. This generalized strategy is then solidified into a research design that finally adopts a specific methodology. The train of thought is that this process is somewhat hierarchical. If one looks down from the top it is easy to see that methodology is dependent upon design which in turn is the product of a strategy that is driven by a particular orientation that is dependent upon fundamental assumptions for its validity.

A natural beginning point for building the research design is to lay out some of the most important assumptions that form the theoretical framework instrumental in supporting the particular research orientation. The theoretical framework for this project is built around a couple of key concepts. The first is institutionalism, which involves a brand of public administration theory that uses an institutional lens to view organizations. More specifically the brand of institutionalism adopted herein views institutions as operating interactively within an open environment that includes other similar organizations/institutions (DiMaggio & Powell,

1983)(Meyer & Scott, 1983). Furthermore, it is contended that this environment has a normalizing effect on individual organizations/institutions. This line of reasoning informs much of the recent neo-institutionalism theory. Neo-institutionalist theory presents the idea of “an institutional field” formed by a group of institutions that have similar functions and interests. As institutions go about their daily business they must operate within this field, and are affected by the actions of other institutions within the field. (DiMaggio & Powell, 1983)

In order to survive, an individual institution must fit into or be accepted by this collection of institutions. This theory assumes first that institutional survival is dependent upon acceptance by other institutions within the field, and second that institutional survival drives the actions of institutions (DiMaggio & Powell, 1983). If these premises are accepted, then it can be reasoned that an important objective of individual institutions is to conform, within a range, to the norms of the institutional field in order to be accepted by the field for legitimacy. In following this line of reasoning, courses of actions of an institution can be better understood by looking to the norms of the institutional field instead of focusing too narrowly on the charted functions and mandates of the individual institution. This theory, as used in this project, is not exclusionary and by no means accounts for all the actions of a particular institution.

The reason this strain of institutionalism is dubbed “neo” is because of the shift in emphasis. Traditional institutional theory often focuses on the internal effects of institutionalism, and the normalizing effect institutional values have on internal organizational structure and individual member beliefs/ attitudes (Pfeffer, 1997; Scott, 1995). Conversely, neo-institutionalism focuses outward where the unit of analysis shifts from individual members to the institution itself operating within its field or environment (Powell & DiMaggio, 1991). The interest turns to what motivates institutional actions as it functions within the overall institutional field. As a result, neo-institutionalism helps to build a conceptual environment conducive to the idea of a professional *ontology* within a functional field. This is the basis for the hypothesis of this dissertation. More specifically, my hypothesis proposes that *a professional ontology exists within the institutional field of aviation safety and that it can be identified through a hermeneutic interpretation of the written texts within the field.*

Within the overall context of neo-institutionalism Michael Foucault’s concept of

“governing rules” can also be informative (Foucault, 1973). Foucault’s concept lends credence to the idea that an *ontology* could be perpetuated within a professional community. According to his concept, “governing rules” exists in institutional bodies which determine what can be talked about, who is allowed to speak and write, and what form the dialogue assumes. Peter Haas’s concept of “epistemic communities” is similar (Haas, 1992). He argues that within certain professional and technical groups knowledge claims are dictated by select members. The academy provides a good example of this type of normalizing, particularly with reference to dissertations. Dissertations are not haphazardly thrown together at the whim of the Ph.D. candidate. What topic is worthy of serious research? What represents good research? What format and types of language are permissible for the dissertation? These are all questions that are meticulously scrutinized by a group of individuals authorized to speak for the Academy. These are the individuals that in Foucault’s concept formulate the “governing rules” of what, who, and how. What makes this project unique and goes beyond current neo-institutional and associated theory, is the contention that “fields” of institutions can have a common *ontology*. Furthermore, *this ontological base is fundamental, and is so basic that it acts as a precursor to communication within the field. Not only does it act as a basis for communication, but is epistemic in nature because it affects knowledge and the acquisition of knowledge within the institutional community. The contention is that a professional or institutional ontology is a powerful influence that frames discussions, dialogue, and patterns of actions within an institutional field.*

The second basic assumption that informs the conceptual framework of this project is that ontological beliefs are language driven and language sustained. At a deeper level, linguists continually debate the relationship of language to thought. Some believe that thought is impossible without language while others see thought and language as separate. These are indeed important philosophical questions that concern linguists and are fundamental to various linguistic theories. However, to delve into this intellectual depth would not suit the scope of this project. Perhaps a more productive device would be to lay out the linguistic propositions used herein and briefly explain their relevance to the stated hypothesis. This approach assumes certain linguistic postulates, which then allows a focus upon the overall effect that language has

on *ontology*. By doing so a linguistic debate concerning the validity of these linguistic postulates is avoided.

There are a number of assumptions concerning language and language use that inform the conceptual framework of this dissertation and are essential to the construction of the research design used herein. Since no attempt is made to prove or disprove these assumptions they will be referred to as postulates. Webster's Standard Dictionary defines the word postulate in this manner: "to assume without proof to be true, real, necessary, especially as a basis for argument". The very orientation of this dissertation and its subsequent research design relies upon certain assumptions concerning language. The stated postulates offer a reference, or if you will, an 'intellectual line in the sand' upon which to gauge credibility and validity of the presented argument. These postulates are as follows:

**Postulate 1:** *There is no such thing as neutral language.*

The idea that some language is loaded while other language can be objective, fair, and neutral is a myth. All language is value-laden. One can speak of degrees of objectivity, fairness, and neutrality, but in the end it is a comparison. Even scientific language, which many like to portray as neutral, cannot escape the injection of value. Language use always involves lexical, semantical, syntactical, and stylistic choices just to mention a few variables available to authors/rhetors. These choices by their very nature are value driven.

**Postulate 2:** *All language use has purpose.*

Language can be intended to inform, persuade, entertain, or more commonly a combination of purposes, but nevertheless there is always a reason. In this sense language use is rhetorical in that it is purposeful. In the world of aviation for example, formal accident reports written by the National Transportation Safety Board (NTSB) are intended to inform, instruct and persuade. They inform in the sense that they detail the probable causes of accidents. They instruct in the sense that they explain how future accidents can be avoided. They are intended to persuade at a couple of different levels. First, the NTSB has no inherent regulatory authority, and can only offer "recommendations" to the Federal Aviation Administration (FAA). Consequently, the

recommendations offered by the NTSB must be written in a manner that persuades the FAA to take action. At a deeper level aircraft accident reports are intended to promote public confidence in aviation by assuring the public that aviation is monitored and scrutinized.

**Postulate 3:** *All language is ambiguous.*

Language by its very nature must be ambiguous. No two individuals perceive the world in exactly the same way; consequently individual perceptions are idiosyncratic. In order to communicate verbally humans use symbols in the form of sounds, words, phrases, and sentences to transform mental perceptions into a medium that can be used to convey perceptions to another human. The process of translating a perception from one unique mind into a language media and having another individual human mind take that message and translate it back into a perception by definition of the individuality/uniqueness of the mind must involve ambiguity. The symbols used to communicate must have a blend of vagueness and representativeness to allow generalization of concepts. The result is ambiguity. Additionally, individual perceptions are never finite. Even within our own minds perceptions are constantly evolving and in that sense are infinite; consequently, language is forever changing and ambiguous.

**Postulate 4:** *Language always involves a speaker and a listener.*

Language always involves a speaker and an audience. Even if one is talking to him/herself or writing an anonymous letter there is most certainly a speaker and an intended listener. In these cases one person serves as both the speaker and the listener. The fact that a listener is always involved in language means that the speaker has intent. Language in this sense is rhetorical and involves a discourse. It is the rhetoric of the language of aviation safety that is being scrutinized in this project. The belief held here is that text (both spoken and written) is an interactive process. By this it is meant that texts are originated by a speaker/writer but in order to have meaning they must be heard/read by a listener who must interpret the message.

These language postulates are relevant in that the basic beliefs and concepts of aviation

safety are reinforced by a particular language use that frames discussion within the aviation safety community. Aviation texts, as part of a scientific community, employ stylistic figures and rhetorical devices to position audiences toward a particular world view (Gross, 1989). Language is important in scientific writing in spite of the science community's anti-rhetorical and anti-literary attitude because language almost always transcends the mere reporting of facts and the transfer of information (Bulhof, 1992). I would go even further and say that language always transcends the mere reporting of facts and the transfer of information. The elaboration and formulation of aviation regulation and policy as well as the discussion, publication and communication of aircraft accident findings are all connected to language.

While institutionalism provides the theoretical ground for the existence of an *ontology*, linguistic theory informs both the conceptual and methodology framework. A dynamic and fluid concept of language underwrites my methodology approach and relies on certain assumptions. First and foremost is the idea that conceptual content is dependent upon and tied to linguistic meaning. Using language consists of the making of linguistic choices, consciously and unconsciously for linguistic and extra linguistic reasons. These linguistic choices, often referred to as rhetoric, involve the strategic organization and communication of a speaker's version of events within a situation in order to effect audience decision-making. On the audience side, people develop cognitive schemata that produce a close relationship between language and tradition. Within an institutional setting this means that thought patterns are greatly influenced by the language practiced in an organization. Language in an institution can even at times become euphemistic when a particular word or phrase is used as a substitute for the true expression.

Having addressed the conceptual framework and linguistic postulates that form the intellectual foundation of this dissertation, the next step would be to look at the general orientation/categorization of the research design. This project is qualitative in nature and grounded in the qualitative research tradition. What exactly is meant by qualitative research tradition? This is best captured by Judith M. Meloy's (in her book Writing the Qualitative Dissertation) concept of "the end is the beginning". Qualitative researchers generally know where they will end up, so the real brainwork involves how does one get there (Meloy, 2002).

There is a strong similarity between qualitative research and what an attorney does in presenting a legal case at trial. The attorney knows the verdict he seeks; consequently, the real tasks at hand is how to convince the jury. Qualitative researchers must develop a strategy, design, and methodology that will produce an argument that persuades the audience (i.e. reader) that the stated hypothesis is believable.

In some ways the qualitative approach is no different from the quantitative approach. Quantitative research is empirical in nature and speaks of “data” that is statistically analyzed in terms of probability. Of course qualitative research is empirical in nature, but the difference is in how it is cloaked. Quantitative research is cloaked in an aura of science and positivism which portrays the researcher as detached and objective, a “instrument” if you will, who merely collects data and subjects it to mathematical interpretation. In fact, quantitative research involves a lot of qualitative application. Earl Babbie states in the eight edition of The Practice of Social Research that “every observation is qualitative at the outset, whether it be your experience of someone’s beauty, the location of a pointer on a measuring scale, or a check mark entered in a questionnaire. None of these things is inherently numerical or quantitative...” (Babbie, 1998). However, in quantitative research most of the qualification occurs before the collection and analysis of data. Before one can collect and analyze data, someone must decide what is to be measured and how it will be measured. To make the determination that numbers and the use of them represent something is a qualitative act.

This dissertation is qualitative in orientation in that the research does not involve quantification and statistical analysis of data. Hermeneutic interpretation is used; consequently, there is no claim of detached objectivity and neutrality for the interpreter. This principle of hermeneutic interpretation is expressed well in Luis Alonso Schökel’s A Manual of Hermeneutics (Schökel, 1998). He states:

“If we take the part of the reader, the ideal of objectivity is a sophism, because, where there is a subject, there is subjectivity. It is impossible to observe without being a part of the process. It is useless to say that it is seen without somebody looking. It is impossible to look from ‘nowhere’, because, in order to be able to see, an angle of vision is necessary. Objectivity rejects that angle, which would

be the same as placing oneself ‘nowhere’ and looking from there...In order to contemplate a painting, I must place myself in some position or other with a certain angle.”

In a similar vane, this dissertation relies heavily on the experiences and knowledge of the author/researcher. The author’s extensive professional aviation career (35 plus years) spanning the globe in military and corporate realms led to the reflections that stimulated the ideas presented here concerning aviation safety. In this respect, the approach used is intuitive and implicit rather than strictly rational and explicit. The objective of this project is to analyze and qualify an intuitive belief, and as such is qualitative in nature.

Having gone over basic assumptions and the general research orientation the next logical step would be to look at the strategy that will link basic assumptions and orientation to research design and methodology. The strategy is centered upon hermeneutics which involves the theory, methodology, and practice of interpretation. Luis Alonso Schökel, renowned hermeneutics scholar and Professor Emeritus at the Pontifical Biblical Institute in Rome, considers the term hermeneutics as applying only to the theory of interpretation. (Schökel, 1998) He uses the term *exegesis* to describe the practice of interpretation, and the phrase *exegetical method* to describe the methodology involved in interpretation. Other scholars use the term hermeneutics collectively to refer to hermeneutical theory, hermeneutical method, and hermeneutical practice. The terms used are not important in themselves, as long as it is understood what is being talked about. It is important, however, to recognize that there is a distinction between theory, method, and practice within the field of hermeneutics.

The strategy underlying the research design of this project involves the use of interpretation. More specifically it involves the interpretation of written texts to identify and describe an *ontology* which exists within the aviation safety community. The strategy is to get at the *ontology* through an interpretation of written material. This approach is based upon the idea that language useage reflects deeper beliefs and values. More specifically, the use of the words “safe” and “unsafe” in aviation safety texts are fostered by an “objectified/reified” view of aviation safety. There are other ways to go after and identify an *ontology*. For example,

personal interviews could be used in an effort to elicit basic assumptions and beliefs of individuals within the aviation safety community. Nevertheless, the strategy here is to look at the written record within a professional community and through interpretation to identify the underlying beliefs and assumptions that form the *ontology* that gives meaning to ideas and concepts of aviation safety. Hermeneutics is the term used for the theory, method and practice of interpretation as an investigative tool and is at the core of the strategy behind the research design and methodology of this dissertation.

The specific research design for this project involves a number of written texts concerned with aviation safety. There are a number of aviation documents and written text that hold the most promise for analysis. There is particular language that can be found in newspaper articles, official speeches, congressional testimony of key aviation officials, and books concerning aviation safety. Examining the language in these texts offers a view into the underlying beliefs that frame how aviation safety is perceived and presented to the public. Newspapers, speeches, testimony, and books are different types of media and represent a good cross-section of public literature that deals with aviation safety.

The methodology chosen to identify the *ontology* of aviation safety involves hermeneutical interpretation. Hermeneutics is an old concept and can be traced to Greek Mythology. The name *hermeneutics* is derived from *Hermes* the Greek god that delivered messages from *Zeus* to the mortals. It was believed that mortals were not capable of understanding *Zeus* directly so it fell to *Hermes* to interpret and relay *Zeus*' messages in terms that mortals could understand. However, it was not until the Reformation that hermeneutics really came into its own. Hermeneutics, which literally means interpretation, was a technique developed by Jesuit Priests to extract the true meaning of the scriptures. Over time the concept of hermeneutics has grown and expanded into three generally recognized fields. There is hermeneutics as a philosophy, hermeneutics as a social critique, and hermeneutics as a methodology. It is the methodology of hermeneutics that will be used as a research tool for this project.

The methodology of hermeneutics itself has a number of different interpretations and applications. For example, as mentioned above hermeneutics was used during the Reformation

to interpret written biblical scriptures. It was concerned only with these specific written texts. Friedrich Schleiermacher (1768-1834) is given credit for developing a generalized hermeneutical method acceptable for the interpretation of any written texts and is known as the father of modern hermeneutics (Mautner, 1996). Eventually, the concept of “texts” itself was expanded to include much more than written texts. Today, rituals, artifacts, myths, or just about anything produced by a society could conceivably be defined as “texts”. However, the texts examined for this project will only be selected written texts of the aviation safety community.

As stated, hermeneutic interpretation will be the method used to examine various aviation safety texts; however, even within the narrowed field of written texts there are various professional opinions of just what hermeneutics should be interpreting. What one might call hermeneutical traditionalists believe that the proper use of hermeneutics is to extract the author’s original intent from the text. Others view texts as more of a dialogue or discourse where both the sender (author) and the receiver (reader) contribute to the meaning of a text. This view holds that the text represents much more than what was intended by the author. This is somewhat similar to views concerning the interpretation of the Constitution of the United States. Some believe that the meaning should be derived solely from the intentions of the founding fathers while others take a much more pragmatic or conditioned approach. The approach taken for this project is an expanded interpretation that looks at the texts of aviation safety as representing much more than the intentions of the author. The hypothesis of this work is that aviation safety texts go beyond the subject matter and conscious intentions of their authors and give clues to basic beliefs concerning aviation safety (i.e. ontology).

The status and condition of the interpreter is another area that needs to be clarified. In traditional hermeneutics where the original intent of the author of a text is of prime importance the ideal interpreter should be detached from the text and a “neutral” entity. The competing strain of hermeneutics and the one to which I subscribe views pre-knowledge of the text as essential for a valid interpretation. Schökel refers to this as pre-comprehension and goes on to say: “This goes against the ideal of the reader’s neutrality, but is based on the reality of experience. When the reader begins to read, there exists a previous relationship of interest. The reader does not come to the text as a neutral subject approaching an inert object. The text is not

simply text, but rather text towards the reader. They are *two* poles in the dialogue which develops comprehension” (Schökel, 1998). Followers of this school of hermeneutic thought contend that there is no fixed meaning in a text, meaning is only acquired through reading. Since there is no fixed meaning in texts and each reader brings knowledge and assumptions to the text it would follow that the more informed a reader is concerning the subject the richer the interpretation.

Another important consideration (in addition to defining concepts of text and interpreter status) in the methodological framework of hermeneutical interpretation is establishing the criteria for interpretation. Hermeneutical interpretation is not an exact science, but rather a subjective, reflective, and reflexive endeavor. However, as G. B. Madison states: “The notion that one can “test” interpretations and subject them to scrutiny in light of the relevant evidence such that objective conclusions can be reached is a purely utopian notion. There can be no *science* of interpretation. This however, does not mean that interpretation cannot be a rigorous (if not exact) discipline, an art in the proper sense of the term, and that one cannot rationally *evaluate* interpretations” (Madison, 1988).

Even though there are no universally accepted guidelines for hermeneutic interpretation it is absolutely critical that practitioners of hermeneutic interpretation establish and explain the principles that will guide their interpretive efforts. Just because hermeneutic interpretation is not an exact science does not mean that it cannot be structured and follow good research discipline. The credibility and acceptance of an interpretation will depend in part on convincing the audience of the intellectual integrity of the work. Interpretations should not be haphazard and idiosyncratic, but rather well thought out and guided by principles of interpretation that elicit confidence. To that end there are a number of suggestions in the literature.

For example G. B. Madison lists coherence, comprehensiveness, penetration, thoroughness, appropriateness, agreement, suggestiveness, and potential as possible guidelines for an interpretation (Madison, 1988). Joyce A. Walker on the other hand suggests five criteria: “the interpretation must be *wide*, the interpretation must be *deep*, the interpretation must be *contextual*, the interpretation must be *connected*, and the interpretation must be *authentic*” (Walker, 1996). In an article entitled Evolving Guidelines for Publication of Qualitative

Research Studies in Psychology and Related Fields seven guidelines are presented as being especially pertinent to qualitative research and include: “owning one’s perspective, situating the sample, grounding in examples, providing credibility checks, coherence, accomplishing general versus specific research tasks, and resonating with readers” (Elliott, Fischer, & Rennie, 1999).

In summary, even though the term hermeneutics is not associated with the forerunners of social science research methodologies, there is a growing literature concerned with the hermeneutical interpretation of text. Using the rigor of disciplined research and guided by solid principles of inquiry, a hermeneutical interpretation of aviation safety texts will provide the methodology to support the hypothesis of this project. The methodological framework for the hermeneutic interpretative approach has been sketched out above in some detail.

### **STYLISTIC/RHETORICAL FACTORS**

There are a number of stylistic or rhetorical variables upon which to base an interpretation of text. In terms of complexity, vocabulary is probably one of the simpler things to look at. Things such as word counts, exceptional words, key words, and ultimate terms (i.e. god, devil, and charismatic) are perhaps classic examples in vocabulary analysis. The extent of vocabulary used can also be a variable. For example TTR (type-token-ratio) is one method used to assess vocabulary. In this case the number of different words (types) is measured against the total number of words (token) as an expression of the expanse of vocabulary. Another important aspect of vocabulary is “silences” which looks at words that are intentionally left out of a text.

Moving up the scale of variables in terms of complexity and subjectivity we encounter semantics which is concerned with the implied meanings of words and phrases. Semantics should prove enlightening when we examine the implied meaning of aviation safety terms such as “safe” and the ontological base that gives meaning to these key words. The analysis of tropes such as metaphor and allegory is also more subjective than an analysis of basic vocabulary, and could be used for the interpretation of aviation safety texts. An even higher order of textual analysis is concerned with rhetorical devices such as argument type (genus & definition, cause &

effect, authority & testimony, etc.), rhetorical patterns (general/particular, problem/solution, etc.), and genre which identifies a constellation of stylistic features peculiar to a text. This list is not extensive by any means, but is intended to give an idea of the things that could be used to analyze aviation safety texts.

The assumption of this project is that the written texts of aviation safety, as an intricate part of aviation language, offer a rhetorical embodiment of world view. Furthermore, the approach is pragmatic in that it views texts and the reading of texts as discourse. By this it is meant that even though texts are author originated and guided they are reader activated and oriented. This study examines the use of language and the interactive and implied meaning of aviation safety texts. The hypothesis is that there is an *ontology* of aviation safety that is firmly rooted in the scientific paradigm, which seeks to objectify problem situations and to logically establish causal relationships by following a hierarchical structure of problem solving procedures.

Newspaper articles and other written texts from the aviation safety community were analyzed using hermeneutical interpretation in an effort to identify language that supports a particular ontological view of aviation safety. The other written texts included selected speeches by FAA officials, official testimony before Congress, and a sampling of books that deal with aviation safety. Speeches, testimony, and books, like newspaper articles contain language and language use that supports a particular view of aviation safety. By examining a cross section of aviation safety literature (i.e. newspaper articles, speeches, testimony. and books) it can be shown that certain words and phrases are used repeatedly throughout this literature that support a particular ontological view of aviation safety. It is the collective effect of their use that solidifies an ontological bent that forms the way aviation safety is viewed in this country.

Newspaper articles that address aviation were the first category of written texts to be examined. The plan was to scan newspaper articles that deal with the subject of aviation and aviation safety to identify and extract quotes that use language which is predisposed to fundamental ontological beliefs concerning aviation safety. It is not that all the language in any one newspaper article is predisposed to a certain *ontology*, but that certain words and phrases used repetitively over a period of time within newspaper articles carry ontological implications. The

use of these words and phrases reinforce a particular belief system concerning aviation safety. They do not have to be used a lot within any specific newspaper article to have an effect. The fact that they can be found across a wide range of newspaper articles is significant. They represent an underlying theme that is presented very subtly within the written texts of aviation safety.

There is a profound difference between viewing aviation safety as something objective and obtainable as opposed to viewing aviation safety as something on a sliding scale that is never really obtainable. Statements within newspaper articles suggest a particular orientation or view of aviation safety. When we find statements like “was that airplane safe to fly?” or “is the ATC (Air Traffic Control) system safe?” or “are the commuter airlines safe?”, they definitely suggest an objectified/reified view and understanding of aviation safety. This view is radically different from a risk assessment orientation and understanding of aviation safety. A risk assessment orientation tends to view aviation as never being completely safe, and consequently involves a risk. Of course there are always things that can be done to make aviation safer, but in the end there is always chance that an accident will occur. This differs fundamentally from an objectified/reified view of aviation safety and accidents.

The specifics of the newspaper article search involved the use of the *Factiva* search engine provided by the Virginia Tech Library system. Within *Factiva* the free text entry used was Aviation Safety. Dates requested were All Dates. The source used was Major News and Business Publications U.S. By using this criteria seventeen (17) Newspapers within the United States were listed for search. The newspapers listed were: *The Atlanta Journal-Constitution, The Baltimore Sun, Barron's, The Boston Globe, Business Week, The Charlotte Observer, The Chicago Sun-Times, The Chicago Tribune, The Christian Science Monitor, The Daily News, The Dallas Morning News, The Denver Post, The Detroit Free Press, The Dow Jones Business News, Forbes, Fortune, and The Los Angeles Times.*

As each of the above newspapers were searched individually a number of “hits” would appear. Each “hit” represented an article in that newspaper that dealt with the subject of aviation safety. Each “hit” or article was then read to ascertain if it contained language that suggested an objectified/reified view of aviation safety. An objectified/reified view of aviation safety is

represented by statements that imply a piece of equipment or situation is “safe” or “unsafe”. As mentioned above statements like “was that airplane safe to fly?” or “was that a safe situation?” imply something that is objective, definable, and achievable in an absolute sense. Consequently, I looked for statements within newspaper articles that contained the concept of objectified/reified safety in this absolute sense. All statements found within the newspaper articles that contained this language were extracted and placed within the newspaper data base. Each statement was quoted and referenced to the particular newspaper article from which it came.

As explained above, statements like “was that airplane safe to fly?” or “the airlines are safe” are examples of statements that imply that safety with respect to airplanes is something that either exist or does not exist. In other words, safety is an attainable condition. Statements like these represent the tip of the iceberg or in our case the tip of an *ontology* that underlies perceptions of aviation safety. There does not have to be a lot of these statements in an article to reflect the underlying *ontology*. Just a few can set the tone for the entire article. It is similar to inflammatory language. Just one racial slur contained within a written document implies a strong bias. I believe the same is true of statements concerning aviation safety. Just one statement referencing aviation safety as something objective and attainable can trump all other statements that may be more risk assessment oriented.

I must reiterate that we are talking about public perceptions. What does the public come away with after reading a particular article? The bulk of any article may not contain examples of the type of language that will be quoted, but the fact that there are statements that suggest that aviation safety is something real and attainable within an article supports an objectified/reified view of aviation safety, and that this view is perpetuated in the media. This view is referred to as an *ontology* because it is deeply rooted and forms the basis for the American view of aviation safety. This view holds that airplanes are either “safe” to fly or they are not. Therefore when airplane accidents occur the reason would be because safety was not achieved. Safety not being achieved is associated with fault which in turn implies negligence. The types of statements that are quoted from newspaper articles and used as data in this dissertation reflect an objectified/reified view of safety, and are representative of the *ontology* that under rides perceptions and dialogue concerning airplane safety.

A key premise of this dissertation is that the types of statements found in newspaper articles that suggest an objectified/reified view of aviation safety can also be found in the speeches and testimony of aviation officials as well as books written about aviation safety. Statements that imply that airplanes, airports, and the air traffic control system are “safe” or “unsafe” are encountered throughout the literature of aviation safety. The task involved here was to examine several types of aviation texts to ascertain if they do indeed contain the same type of language as that of newspaper articles and to what degree. The belief is that this type of language use represents the cornerstones of an underlying aviation safety *ontology* that sees the aviation events as “safe” or “unsafe”.

The second and third sets of data presented examined examples of speeches and testimony by government officials to determine if they contained the types of language that suggest an objectified/reified view of aviation safety. The question is whether the language used in speeches and testimony by government officials is the same as the language that is used in newspaper articles. By examining speeches and testimony of government officials I believe that the same types and examples of language that suggest an objectified/reified view of aviation safety can be found. The degree and extent of use will often times depend on the audience to be addressed. The collection of data for speeches and testimony differed somewhat from the data collected for newspaper articles.

For newspaper articles the goal was to review articles retrieved by the search design until one hundred examples of language use that supported an objectified/reified view of safety could be found. This approach was used for two reasons. First, the search words for newspaper articles were aviation safety. What this meant was that any article that contained *either* word would be retrieved. Consequently, a large number of articles that did not address the issue of aviation safety were expected; therefore more articles were needed to capture the subject. Additionally, it was felt that a larger number of articles would render a more accurate percentage gauge.

For speeches and testimony I used a Federal Aviation Administration (FAA) web site. From the FAA home site there is a link to an FAA site that contains news and speeches/testimony from FAA sources ([www.faa.gov/news/speeches](http://www.faa.gov/news/speeches)). I believe that speeches and official testimony will contain language much the same as that of newspaper articles. Within

speeches and testimony there will be language use that suggests and implies an objectified/reified view of aviation safety. For an examination of speeches I selected the forty (40) most recent speeches of the top FAA officials. Twenty five (25) of the FAA Administrator's speeches, five (5) of the Deputy Administrator's speeches, five (5) of the Associate Director for Safety speeches, and five (5) of the Chief Operating Officer speeches formed the data base for speeches.

For official testimony I used the same FAA web site listed above. The FAA data base contains all of the recent speeches and testimony of key FAA officials. From this data base I selected eight (8) of the most recent testimonies of the FAA Administrator, four (4) of the most recent testimonies of the FAA Associate Director for Safety, and four (4) testimonies of the previous FAA Administrator. Obviously, examples of testimony from government officials were not as numerous as examples of newspaper articles. The newspaper articles encompassed quotes from a much wider pool of aviation officials to include not only government officials but legislators, businessmen, and aviation officials from many walks of life.

The last set of data examined and interpreted was a selection of two books, each viewed as an entire text. The books selected for interpretation were: Collision Course: The Truth About Airline Safety by Ralph Nader and Wesley J. Smith, and Building Safe Systems in Aviation by Norman Macleod. I tried to select a representative sampling of books concerning aviation safety. Just as with any subject, books written about aviation safety can vary greatly. To begin with the authors can be professional aviators, academics whose subject of interest is aviation, investigative reporters, safety professionals, agenda writers (i.e. Ralph Nader), or a myriad of others. Likewise, the material within the book can be organized in various ways. For example, the case study approach is often used. Other ways to distinguish books written about aviation safety include the credentials of the author, the organization of the material, the agenda of the author, or the intended audience to mention just a few.

The objective of the book examination/interpretation was to determine if one or both of the selected books contained language similar to the language found in newspaper articles. The idea is that within these books an underling theme can be identified just as within newspaper articles, speeches and testimony. However, the newspaper, speech and testimony methodology

differs somewhat from that used in the interpretation of books. The use of the words “*safe*” and “*unsafe*” were the critical elements of the methodology used to examine newspaper articles, speeches, and testimony. The assumption is that when these words can be found within texts they imply an objectified/reified view of aviation safety.

Books, on the other hand, were reviewed and assessed as an entire text. The methodology used was still interpretation, but with a more holistic and traditional hermeneutic approach. Books leave an impression, and the question pursued was what impression or overall feeling resonates with the reader after completing the book. Is it a feeling that aviation and planes are “safe” or “unsafe”? Or is it perhaps a feeling that airplanes are very complex machines that operate in an even more complex environment. Within books, the use of the words “safe” and “unsafe” are still important, but equally important are some of the larger elements of language, such as rhetorical devices, rhetorical patterns, and a sense of the linguistic genre of the entire text. Much the literature of aviation safety implies and suggests an objectified/reified view of the subject. This view is manifested as an *ontology* within the public psyche because it is so deeply rooted in the subconscious of public perceptions of aviation safety.

### **Hypothesis**

Language use within the aviation community is grounded in an ontological view that perpetuates a particular world view of aviation safety. This world view manifests meaning in three key themes that stand out in the written text of aviation safety. First, aviation safety is conceived of as science. Aviation, in essence, involves man made machines that can overcome gravity and fly. The metaphor of machine stands at the very core of aviation. From the turn of the Twentieth Century airplanes have been referred to as “flying machines”. The leading edge technologies for flight and space travel are developed and applied through the scientific paradigm. It could be said that aircraft and manned flight represent the epitome of scientific endeavor. Because the machines and mechanics of flight are outgrowths of science, the tendency is to apply the same premises to our concepts of aviation (i.e. safety). Consequently, we see aviation safety as science.

Second, is the concept that safety of flight is an objective condition. This concept is an

outgrowth or rationalization that stems from the scientific paradigm. By objective condition I mean the idea that a particular flight was either “safe” or “unsafe”. In aviation reporting one often hears “was that flight or act safe?” The implication is that safety is something real and detached from man. In reality, safety is a mental construction. Of course, bench marks and goals can be established to create a facade of objectivity, but in reality safety involves an assessment of risks. The objectification/reification of the idea of aviation safety is something that I hope to identify by means of hermeneutic interpretation and content analysis of selected aviation safety texts. Both the media and the aviation community tend to talk of aviation safety in absolute terms.

Lastly, as an extension of the first two concepts, is the firm belief that aircraft accidents are controllable. Because flight is scientifically based and safety of flight is achievable, the natural conclusion is that all accidents are preventable. Common logic tends to bear out this conclusion. The assumption is that a direct link exists between the amount of time and resources devoted to making something “safe” and the level of safety attained. There is nothing inherently wrong with this thinking in itself, but when it is joined with an objectified/reified view of safety it can take on a different significance. The three basic concepts described above form the basis of an aviation safety *ontology* that has been central to the governance of aviation and to the public’s perceptions of aviation safety.

Aviation texts are products of an institutional *ontology* that exhibits literary devices or strategies that support a particular world view of aviation safety. The use of metaphors, similes, personifications, literary genres, appeal to readers’ experience, manner of argumentation, canalization of events, style, syntax, and semantics are examples of literary devices employed within aviation texts. This project will examine some of the literary devices of aviation texts and build the case that they support an *ontology* that underlies concepts and action paradigms of aviation safety. The way we view aircraft safety and the actions we take in response to accidents are driven by this *ontology*. Our views of aviation safety are so entrenched that it is seldom recognized that there could be different approaches to aviation safety.

For example, the concept of risk management has a much different orientation. The medical profession offers a good example. Medicine, like aviation, is a very technical and

science driven field. Consequently, medicine like aviation rides on the crest of technology and scientific breakthrough. Yet, the approach to the safety of medical procedures is very different. One rarely hears the definitive statement “that medical procedure is safe”. The medical profession’s concept of safety is firmly embedded in the ideal of risk. Every medical procedure involves risk, and physicians make certain that the patient knows the risks before they operate even for minor medical procedures. This is a completely different approach to safety than that of aviation. Risk assessment is not a concept that resonates within the aviation safety *ontology*. By contrasting the medical profession with aviation it is easy to see that there are different ways of looking at safety.

### **Research Design Summary**

The research design uses interpretation of written texts based upon the hermeneutical method. The written texts selected for interpretation include: newspaper articles, speeches and testimony of aviation officials, and books which address aviation safety. By reviewing and interpreting specific language and concepts within these texts I hope to show how an underlying ontology exists that views aviation safety from an objective perspective. The *ontology* that exists underlies public perceptions. It is not that the authors intentionally try to promote this *ontology*, but by using certain types of language it is perpetuated in the public perception of aviation safety. In fact, it is more likely that aviation safety professionals as a general rule hold a much more subjective view of aviation safety. However, by letting language that implies an objectified/reified view of aviation safety slip into their writing, the public comes away with an objectified/reified view of aviation safety. It does not take many of these statements within a particular text to set the tone for the underlying *ontology* of aviation safety.

## CHAPTER IV

### FINDINGS

Before offering an interpretation of the data collected it is necessary to discuss in some detail just what type of data was collected and what it represents. The data collected to support the hypothesis of this dissertation was taken from four sources: newspaper articles, public speeches by FAA officials, official testimony by FAA officials before Congress, and selected books that address the topic of aviation safety. In these four types of aviation safety texts “language use” was examined to determine if examples of language usage could be found that suggest a certain underlying predisposition toward an objectified/reified view of aviation safety. An objectified/reified view of aviation safety looks at safety as something that is obtainable. It is an absolute view that speaks of conditions as being “safe” or “unsafe”.

A subjective view of safety, on the other hand, speaks of conditions in degrees of safety. In the subjective view something is never completely “safe”, and conditions always represent degrees of safety. As mentioned previously, the medical profession offers an excellent example of a field that is founded upon a subjective interpretation of safety. The emphasis in the medical profession is that all medical procedures involve a degree of risk; therefore, nothing is ever “safe”. It is highly unlikely that one would ever hear a physician state that a particular medical procedure is “safe”. Instead one hears comments like “the success rate of this procedure is extremely high”. The medical profession holds a radically different concept of safety that stands in contrast to that of the aviation industry. The objectified/reified view of aviation is the focus of this dissertation, and the view that I suggest represents the basis for how the public thinks about aviation safety.

Samples of written texts from the four sources were read to determine if examples of statements existed within the body of the text that suggested aviation safety is something tangible and a definable state of being. In other words, these statements can be said to represent an objectified/reified view of aviation safety. For example a statement like “was that airplane safe to fly?” implies that being “safe” is a definite state of existence. When the word *safe* is used in

conjunction with the verb *to be* the resulting context is that being safe is a definite state. It implies that an airplane is either “safe” to fly or it is not. This type of thinking is the bedrock for a concept of aviation safety that views safety as something definable. The author believes that this view is prevalent in public discourse concerning aviation safety, and represents a fundamental belief system or *ontology*.

The findings listed below are objective statements concerning aviation safety that were extracted from four types of texts. The texts reviewed, as mentioned above, were newspaper articles, public speeches by FAA officials, testimony by FAA officials before Congress, and selected books whose subject was aviation safety.

## **FINDINGS: NEWSPAPER ARTICLES**

The specifics of the newspaper article search involved the use of the *Factiva* search engine provided by the Virginia Tech Library system. Within *Factiva* the free text entry used for the search was Aviation Safety. Dates requested were All Dates. The source used was Major News and Business Publications U.S. By using the above criteria seventeen (17) Newspapers within the United States were selected from the search. The newspapers selected were: *The Atlanta Journal-Constitution*, *Barron's*, *Business Week*, *The Charlotte Observer*, *The Chicago Sun-Times*, *The Chicago Tribune*, *The Daily News*, *The Denver Post*, *The Detroit Free Press*, *The Dow Jones Business News*, *Forbes*, *Fortune*, *The Los Angeles Times*, *News Day*, *Newsweek*, *the Orlando Sentinel*, and *the Washington Post*.

The reason that seventeen newspapers were selected was because it took a review of seventeen newspapers to acquire 100 quotes of statements that represent an objectified/reified view of aviation safety as exhibited by the use of the word *safe* in conjunction with the verb *to be*. The number 100 was an arbitrary quantity selected by the author as representing a large enough data pool to make the point. Using *Factiva* with the criteria listed above a list of newspapers would appear that contained articles that included the words aviation/safety within

the body of the text of the article. Each article is referred to as a “hit” in the jargon of computer searches. For example using the *Factiva* search the newspaper *Business Week* appeared followed by the notation of 16 hits. This meant that by using the criteria above (i.e. aviation/safety and all dates) *Factiva* came up with 16 separate newspaper articles in *Business Week* on various dates that matched the word criteria.

The target for quotes was 100 statements that represented an objectified/reified view of aviation safety contained within newspaper articles. The criteria for the search are outlined above and the results were as follows:

<u>Newspaper</u>	<u>“Hits”</u>	<u>Statements</u>
The Atlanta Journal	(120)	(9)
Barron’s	(4)	(0)
Business Week	(16)	(5)
Charlotte Observer	(0)	(0)
Chicago Sun-Times	(155)	(16)
Chicago Tribute	(0)	(0)
Daily News	(27)	(3)
Denver Post	(113)	(10)
Detroit Free Press	(0)	(0)
Dow Jones News Service	(95)	(5)
Forbes	(3)	(2)
Fortune	(2)	(0)
Los Angeles Times	(0)	(0)
Newsday	(95)	(14)
Newsweek	(6)	(1)
Orlando Sentinel	(0)	(0)
<u>Washington Post</u>	<u>(435)</u>	<u>(37)</u>
	1071	102

Each article was then retrieved and read line by line to determine if objectified/reified statements of aviation safety could be found. If an objectified/reified statement concerning aviation safety was found it was extracted and entered into the data base. The end result for the newspaper article search is that it took the review of 1071 articles to come up with 102 statements that reflected an objectified view of aviation safety. In other words approximately 10% of the articles reviewed contained statements that reflect an objectified/reified view of

safety. As noted, these statements were extracted from the articles as quotes and form the newspaper article data base (attachment #1 to this chapter).

Each quote is referenced by the newspaper in which it appeared, the date that it appeared, and the author(s) of the article. As stated above the words used for the newspaper article search were *aviation/safety*. Different words or a combination of words could have been used for the search that most likely would have produced a different ratio of the statement to article relationship. The words *aviation/safety* represent a rather broad category to use. Consequently, a lot of the articles were not really relative to this investigation. For example, an article retrieved under the category *aviation safety* might have been written about the reorganization of the safety departments within the FAA. Such an article would not address the issue of safety as applied to aviation practices or accidents. The significance of the ratio of these findings will be addressed in the Conclusion chapter.

## **FINDINGS: PUBLIC SPEECHES**

The second category of aviation text examined was speeches by FAA officials before various forums. FAA speeches are available on the official FAA web site: [www.faa.gov/news/speeches/current\\_officials/index.cfm](http://www.faa.gov/news/speeches/current_officials/index.cfm). A total of forty (40) speeches were retrieved from this web site for the purpose of review. The breakdown of the speeches by author were as follows: **Marion C. Blakey**/FAA Administrator (25); **Robert A. Sturgell**/FAA Deputy Administrator (5); **Russell G. Chew**/FAA Chief Operating Officer (5); and **Nicholas A. Sabatini**/FAA Associate Director for Aviation Safety (5). These speeches are contained in attachment #2 to this chapter.

The data base for speeches went back for seven years and included a number of FAA officials. Consequently, the total number of speeches retrievable were much greater than forty (40) that were selected. The number forty (40) was an arbitrary number chosen by the author for the speeches to be reviewed. In the author's opinion, it represents a large enough number of

speeches to capture a cross section of audiences. The speakers (a total of four) represent the top three officials within the FAA, and the senior official responsible for aviation safety within the FAA.

The methodology for examining the speeches was the same as that used for the newspaper articles. Each speech was read in its entirety to identify statements that reflect an objectified/reified view of aviation safety. The same criteria for identifying statements that reflect an objectified/reified view of aviation safety used in newspaper articles was also applied for speeches. Statements that imply that something is either “safe” or “unsafe” in describing something within aviation operations were the target for this search. If statements were found they were extracted and recorded as quotes in attachment #2 to this chapter.

The results of the examination of the forty (40) speeches selected for review were as follows:

**Marion C. Blakey** – Of the twenty-five (25) speeches reviewed statements that reflect an objectified/reified view of safety were found in ten (10) of the speeches.

**Robert A. Sturgell** – Of the five (5) speeches reviewed statements that reflect an objectified/reified view of safety were found in three (3) of the speeches.

**Russell G. Chew** – Of the five (5) speeches reviewed statements that reflect an objectified/reified view of safety were found in one (1) of the speeches.

**Nicholas A. Sabatini** – Of the five (5) speeches reviewed statements that reflect an objectified/reified view of safety were found in three (3) of the speeches.

In terms of percentages the data collected shows that forty percent (40%) of Marion C. Blakey’s speeches contained a statement that reflects an objectified/reified view of aviation safety. In both Robert A. Sturgell and Nicholas A. Sabatini’s speeches sixty percent (60%) were found to contain statements that reflect an objectified/reified view of aviation safety. Finally of Russell G. Chew’s five speeches only one contained a statement that reflects an objective view of safety which yields a percent rate of twenty percent (20%).

The speeches selected were given before a diverse collection of audiences. As with newspaper articles some of the speeches were about subjects more likely to contain statements pertinent to aviation operational safety. Other speeches were less likely to contain statements

addressing safety simply because of the subject matter. Speeches of this type might include a ground breaking or ribbon cutting speech which most likely would not address safety issues. The significance of the subject of a particular speech on the findings will be addressed in greater detail in the Conclusion chapter.

## **FINDINGS: OFFICIAL TESTIMONY BEFORE CONGRESS**

The third category of aviation safety text examined was official testimony before Congress. FAA testimony is available on the official FAA web site: [www.faa.gov/news/speeches/current\\_officials/index.cfm](http://www.faa.gov/news/speeches/current_officials/index.cfm) . A search on this site permits the selection of a specific month and year or the selection of all months and all years within the data base. The data base contains testimony for the past seven years (i.e. 2001-2007). For example someone could search for FAA testimony for the month of November in the year 2005. Another option would be to search for all months within a specific year or one could search for a specific month in all the years. The most comprehensive option is to search for all months and all years. The last option was the one used to retrieve testimony for our purposes. Consequently testimony was retrieved for all months for the years 2001-2007.

The above mentioned search produced a data base containing 80 prepared statements that were submitted before various House and Senate Subcommittees as testimony during the referenced time frame. The prepared statements were presented by a total of 22 FAA officials. A breakdown of the prepared statements by presenting officials is as follows:

Marion C. Blakey/Administrator (25)  
Jane F. Garvey/Administrator (15)  
Robert A Sturgell/Deputy Administrator (2)  
Monte R. Belger/Acting Deputy Administrator (2)  
Russell G. Chew/Chief Operating Officer (2)  
Jon L. Jordan/Federal Air Surgeon (3)  
Charles Keegan/Associate Administrator for Research & Acquisitions (3)

Steven Laidman/Associate Administrator for Research & Acquisitions (5)  
D. Kirk Shaffer/Associate Administrator for Airports (1)  
Nickolas A. Sabatine/Associate Administrator for Aviation Safety (8)  
Woodie Woodward/Associate Administrator for Airports (2)  
Steven J. Brown/Acting Associate Administrator for Air Traffic (1)  
Peggy Gilligan/Deputy Associate Administrator for Regulation (1)  
Dan Elwell/Assistant Administrator for Aviation Policy (1)  
Daniel J. Mehan/Assistant Administrator for Information Services (1)  
Michael A. Cirillo/Vice President for Systems Operations Services (1)  
Victoria Cox/Vice President for Operations Planning Services (1)  
Linda Schuessier/Vice President for Systems operations Services ATO (1)  
William Davis/Director Runway Safety Program (1)  
Nicolas L. Lacey/Director for Flight Standards Service (1)  
Charles Leader/Director Joint Planning & Development Office (1)  
Bill Wilhycombe/Regional Administrator Western Pacific Region (2)

As mentioned, testimony by the above cited officials was given before various House and Senate subcommittees. On the House side the two subcommittees that were involved the most in aviation issues were The House Appropriations Committee (Subcommittee on Transportation) and The House Transportation and Infrastructure Committee (Subcommittee on Aviation). On the Senate side the two subcommittees involved the most were The Senate Commerce Committee (Subcommittee on Aviation) and The Senate Appropriations Committee (Subcommittee on Transportation). There was a smattering of other committees that heard testimony, but the four subcommittees listed above received the bulk of FAA testimony.

From the data base of 80 prepared statements presented by twenty two (22) FAA officials available on the FAA web site I selected 40 statements to review and examine for language content. I reviewed twenty (20) statements by **Marion C. Blakely** the current FAA Administrator, five (5) statements by **Jane F. Garvey** former Administrator, two (2) statements by **Robert A. Sturgell** the Deputy Administrator, two (2) statements by **Russell G. Chew** Chief Operating Officer, two (2) statements by **Woodie Woodward** Associate Administrator for Airports, eight (8) statements by **Nickolas A. Sabatine** Associate Administrator for Aviation Safety, and one (1) statement by **William Davis** Director Runway Safety Program.

The results of the examination of the forty (40) prepared statements selected for review were as follows:

**Marion C. Blakey** – Of the twenty (20) statements reviewed statements that reflect an objectified/reified view of safety were found in nine (9) of the statements.

**Jane F. Garvey** – Of the five (5) statements reviewed statements that reflect an objectified/reified view of safety were found in two (2) of the statements.

**Robert A. Sturgell** - Of the two (2) statements reviewed statements that reflect an objectified/reified view of safety were found in one (1) of the statements.

**Russell G. Chew** – Of the two (2) statements reviewed statements that reflect an objectified/reified view of safety were found in two (2) of the statements.

**Woodie Woodward** – Of the two (2) statements reviewed statements that reflect an objectified/reified view of safety were found in none (0) of the statements.

**Nickolas A. Sabatine** – Of the eight (8) statements reviewed statements that reflect an objectified/reified view of safety were found in six (6) of the statements.

**William Davis** – Of the one (1) statement reviewed statements that reflect an objectified/reified view of safety were found in none (0) of the statements.

In terms of percentages the data shows that forty five percent (45%) of Marion Blakey's statements contained statements that reflect an objectified/reified view of safety. Jane F. Garvey, the previous Administrator had forty percent (40%). The Deputy Administrator, Robert A. Sturgell had fifty percent (50%). Russel G. Chew, The Chief Operating Officer, had one hundred percent (100%). Woodie Woodward and William Davis had no objectified/reified statements (0%) in their three statements. Nickolas A. Sabatine, the chief safety official within the FAA had seventy five (75%) which is significant.

The criteria used to examine the cited statements was essentially the same as that used to review newspaper articles and speeches. The text of the prepared statement was read in detail to determine if sentences contained language that suggested an objectified/reified view of aviation safety. As previously offered statements like “was that airplane safe to fly?”, or “we have a safe air traffic control system” imply an objectified/reified view of safety. They suggest that

something is either “safe” or “unsafe”. The underlying belief is that being “safe” is an obtainable state of being and that it is definable. This represents what I believe is an objectified/reified view of safety. Conversely, a subjective view of safety is quite different. In this view, safety is something that moves up and down a sliding scale. There are variable degrees of safety and the ultimate question becomes “is it safe enough?” This approach to safety represents a vastly different mindset from an objectified/reified view that sees something as either “safe” or “unsafe”.

## **FINDINGS: BOOKS**

The fourth and final source of data reviewed was books whose subject matter focused on aviation safety. A total of two books was selected for review. Each book was selected because it represents a specific perspective. Books are usually written with an overall objective in mind. For example, the main purpose might be to entertain; it could be to inform; or it may have been written to persuade and influence decision making. In the end most books end up doing a little of all the above, but there are differences in the intended purposes of books. Consequently, books are usually written with a specific audience in mind. They might be written for the general public or they could be more narrowly focused and written for a professional audience.

The purpose of the book and the audience to which they are directed will often dictate how a work is composed. The author relies on the sophisticated use of language. Options such as general organization, genre, argument type, word choice, syntax, etc. are but a few of the tools available to the writer to effect his purpose. The possibilities are endless. Books written about aviation safety are no exception.

On the shelves one can find books written with the professional aviation audience in mind. At the other end of the spectrum are books written for general public consumption. These books are generally more emotional in their approach and often times build toward some form of conspiracy theory. In between these two representative types are an array of books that are more

middle of the road. In selecting books for review I tried to choose two books that fall roughly at opposite ends of the spectrum.

I approached the review of the selected books in somewhat the same manner that I approached the other sources (i.e. newspaper articles, official testimony, and speeches). I read the books in their entirety to see if they contained statements like the other sources that imply an objectified/reified view of safety. Statements like “is it safe?” or “was that condition unsafe?” are representative of this type of thinking.

In addition, each book was reviewed as a complete text and interpreted using a hermeneutic approach. Books are a collection of words, phrases, sentences, paragraphs, and chapters put together to create an idea, theme, or story for the reader. As stated before, language is never completely neutral, but rather always has purpose and direction. By using elements of language evaluation such as: style, organization, genre, semantics, syntax, and argument logic an interpretation can be made with respect to a particular text. Examining these elements helps to decipher the underlying premises and ontological roots of a text. The ontology of a text offers a particular mindset which provides a core reference point from which all other ideas radiate.

## **BOOKS REVIEWED**

### **(First Book)**

The first book selected for review is entitled Building Safe Systems in Aviation written by Norman Macleod. The sub-title of the book is “A CRM Developer’s Handbook”. CRM is the abbreviation for *crew resource management*. This book is written for an audience of professional aviators and is divided into three parts. The first part defines the concept of CRM and talks about safety and the learning organization. The second part discusses how to develop a training program within one’s organization. The third part presents ways to measure results of a CRM training program. This particular book was intended for instructional purposes in that it

explains how to establish a Crew Resource Management (CRM) program within an aviation department. It was written by an aviation professional and intended for a professional aviation audience. There are no political objectives and the basic assumption is that CRM is a valid concept and good practice for the flying public.

The analysis of the book began by scanning the book to see if it contained statements reflecting an objectified/reified view of aviation safety. Just as with newspaper articles, speeches, and testimony I looked for statements that suggested a view of aviation safety which implies that something is either “safe” or “unsafe”. It was fairly easy to find statements that reflect an objectified/reified view of aviation safety in this book. Listed below are examples of statements found within the first thirty pages of the book. They imply an objectified/reified view of aviation safety.

“In this book I try to get people to think about the reason why we call groups of people together to discuss safe operations...” (preface)

“Let us start with CRM itself. John Lauber, a psychologist then serving as a member of the NTSB, defined CRM as ‘using all available resources to achieve safe and efficient operations.’” (p.4)

“From this definition we can identify 2 possible indicators of an unsafe condition...” (p.11)

“When we apply a rigorous framework of analysis, such as barrier analysis, we can identify the ways in which we attempt to keep the system safe.” (p.13)

“We know from statistical analysis that unsafe events are not evenly distributed across the aviation industry.” (p. 17)

“Unsafe behavior is considered to be a threat to production that can be solved, in part, by better job design or the provision of better preventive measures.” (p.19)

“Unsafety arises when departures from rules occur.” (p.21)

“What this interpretation means is that, first, we provide knowledge and then we assume that the individual applies rational behaviour , the result being a safe outcome.” (p. 27)

The fact that one can find statements like these relatively easily throughout the book is important support for the basic hypothesis of this dissertation. This is not a case of “either or” in terms of statements. Statements which don’t reflect an objectified/reified view of aviation safety can be found just as easily throughout the book. The significance of this will be addressed in the Conclusion Chapter which follows.

In terms of an overall interpretation/evaluation of the first book I will begin with the title: Building Safe Systems in Aviation; A CRM Developer’s Handbook. The title itself implies an objectified/reified view of aviation safety. The statement “building safe systems” assumes that systems can be “safe”. The underlying assumption is that systems are either “safe” or “unsafe”. The title could have just as easily been Building Safer Systems in Aviation, but “safer” implies a degree of safety where as “safe” implies a definite state of being. Talking about something being “safer” implies that safety is incremental in nature and is relative. Being incremental and relative are concepts rooted in a subjective ontology as opposed to an objective ontology.

Following an examination of the Title page of the book I looked at the Contents page of the book. The Contents page read as follows:

## **CONTENTS**

### **PART I; ESTABLISHING THE AIM**

1. Defining Crew Resource Management
2. Safety and the Learning Organization
3. Establishing the Goal – Identifying CRM Behaviour

### **PART II; THE CONDUCT OF TRAINING**

4. Developing Training Activities
5. Delivering Training

### **PART III; MEASURING RESULTS**

6. Measuring the Effectiveness of CRM Training
7. Measuring CRM Skills
8. Administration of the Process

General impression of the content page is that it is very objective in its tone. The three parts speak of establishing, conducting and measuring results of a *crew resource management* program. This implies something objective and scientific in its approach. When we talk about measuring something we are implying empirical means of evaluating the program. A quantitative approach rests upon an objective viewpoint. In addition terms like “learning organization” and “the process” further reinforce an objective impression. Overall, the table of contents suggests an objective view of aviation safety.

The next step in examining the book was to focus on the introduction and conclusion of each individual chapter. The introduction and concluding paragraphs of a chapter usually offer summations of the core ideas of the material in that chapter. Furthermore, they tend to be written in a manner and style that best captures the author’s intended message. By giving the introduction and conclusion of each chapter a thorough reading one can get a sense of the tone of the book, and an insight into the ontological base of the work.

The chapter introduction and concluding paragraphs in Building Safe Systems in Aviation: A CRM Developer’s Handbook were clearly written from an objective ontological viewpoint. The concluding paragraphs often offer the most vivid examples. They were generally very short and consisted of only one paragraph, yet they almost always made reference to something as being “safe”. The only exception to this finding was in a few chapters that were more narrowly focused on training. Consequently, these conclusions did not address the issue of

safety. So there was neither an objective nor subjective viewpoint presented in those chapters. But where the issue of safety was mentioned it was done so with an objectified/reified view of aviation safety.

The overall assessment of the book is derived from a hermeneutic interpretation of the material. The factors above all contribute to the overall evaluation of the book. The title, the table of contents, the use of objective words (i.e. “safe” and “unsafe”), and the tone and construction of the introductory and conclusion paragraphs all contribute to an overall assessment of the book. In addition to these factors the content of the various chapters lend themselves to an objectified/reified view of safety.

The second chapter in Part I entitled “The Learning Organization” does layout other perspectives of safety. In this chapter the author explores various aspects of the concept of safety and at times offers a more subjective view of aviation safety. For example, he speaks of safety in terms of “risks”. He suggests that risks involve three elements: probability, consequence, and context. He goes on to state that accidents and risks are inevitable and that safety is in fact risk management. Risk management in turn can be thought of as a system that creates “barriers” to accidents. In other words, one can create procedures designed to interrupt the change of events that can lead to an accident. This is certainly a more subjective view of aviation safety.

This chapter is brought to the attention of the reader not to counter the argument that this particular book has an objectified/reified view of safety, but rather to make an important point. The point is that books and texts in general are never completely objective or subjective in their viewpoint. Within any texts concerning aviation safety one can find contingents of both an objective and a subjective view of aviation safety. The subject matter and the point to be made in a particular paragraph will often drive the approach. However, most texts offer an overall perspective of aviation safety that tends to favor one view or the other. The overall interpretation of the book is a judgment as to which view is favored. It is by no means a numbers game. One does not just add up the number of statements that reflect a particular view, but rather looks at where and when statements appear in order to get a sense for the tone of the book. The assessment of this book is that below the surface lies an objectified/reified view of aviation

safety. There most certainly are statements that reflect a subjective view of aviation safety, but the core beliefs of this book suggest an objectified/reified view of aviation safety.

### **(Second Book)**

The second book selected for review is entitled Collision Course: The Truth About Airline Safety. It was written by Ralph Nader and Wesley J. Smith. Most everyone is familiar with Ralph Nader's work as a consumer advocate. Although not as famous as Ralph Nader, Wesley J. Smith is also what can be considered a consumer advocate. His written works are in the same vein as Nader's. Smith's other works include Consumer's Guide to a Brave New World and Culture of Death: The Assault on Medical Ethics in America. He also coauthored one other book with Ralph Nader entitled Winning the Insurance Game: the Complete Consumer's Guide to Saving Money. The point of citing these works is to show that both Nader and Smith are consumer advocates and not aviation professionals. Their book about airline safety is written from a consumer advocate perspective and directed toward the general public.

The analysis of this book began, as with the first book, by scanning the book to see if it contained statements reflecting an objective view of aviation safety. Just as with newspaper articles, speeches, and testimony I looked for statements that suggested a view of aviation safety which implies that something is either "safe" or "unsafe". Once again, it was fairly easy to find statements that reflect an objectified/reified view of aviation safety. Listed below are examples of statements found that imply an objectified/reified view of aviation safety.

“So, is flying safe? That question is not easy to answer.”

“What is needed to answer the query, ‘Is flying safe?’ is an analysis of the current issues and trends affecting aviation safety as seen by those who work in the field...”

“For aviation to prosper it must be safe. Safety depends on many factors, such as the quality of aircraft design, the training of pilots, and excellent maintenance.”

“First, the companies must manufacture safe aircraft and replacement parts.”

“In other words, this plane landed without the air traffic controller advising the pilot that it was safe to do so.”

“I mean, it’s the very first thing people ask about an airline. Not what kind of food do they have, but is it safe to fly.”

“To the frustration of union officials and others interested in safe airline operations, the FAA will sometimes pass a rule and then fail to enforce it.”

The next step, as with the first book, was to examine the title of the book. The title of this book is Collision Course: The Truth About Airline Safety. It is easy to see that the title is emotionally charged. The term “collision course” implies that a particular course of action is dangerous and will most likely end with fatalities. The second part of the title plays off the negativity of the first part and most definitely reflects an objectified/reified view of reality. It talks about “The Truth” as if there is one and only one “Truth”. In essence, the bias of the title is that airline safety is suspect, and that the authors will tell you the truth about just how dangerous airline travel can be.

As with the first book, following the examination of the title page I looked at the contents page. The table of contents read as follows:

# CONTENTS

## Part I: The System

### 1 The Past leads to the present

The early days of government regulation  
The modern era

### 2 The aviation safety community

The role of government  
Aviation safety and the role of Congress  
General accounting office  
The executive branch and safety regulation  
National Aeronautics and Space Administration (NASA)  
The National Transportation Safety Board (NTSB)  
The International Civil Aviation Organization (ICAO)  
The private sector  
Industry lobbyists, unions, and citizen activists

### 3 Taking safety's measure

The statistical record  
Statistics  
NASA's Aviation Safety Reporting System  
Missing stats

### 4 Bureaucratic quicksand

Bureaucracy in inaction  
A true story from the quicksand

### 5 Deregulation

Economic deregulation has created the need for stronger safety regulation

## **Part II: The FAA follies**

### **6 The tombstone imperative**

The case of the frozen regulations  
The case of planes flown into the ground  
The case of murder in the skies

### **7 At cross-purposes**

FAA rule shopping to accommodate airlines  
When rule is not a rule

### **8 They have those mismanagement blues**

The safety Indicators Program  
The mismanagement inspectors  
Modernizing air traffic control

## **Part III: Air traffic control**

### **9 Flying from here to there**

How air traffic control works  
Central Flow Control  
From takeoff to landing

### **10 The controller's unhappy decade**

The PATCO strike  
How controllers are trained  
FAA Tries to rebuild the system  
Rehire the fired controllers

## **11 Troubled technology**

System breakdown  
Software malfunctions  
The TCAS controversy

## **Part IV: The Equipment**

## **12 Aging aircraft**

The Aloha Airlines tragedy  
The government and industry react

## **13 Crash survivability**

Child safety seats  
Passenger protective breathing devices  
Evacuation time  
Flotation devices

## **14 I dotting and T crossing**

Certification and testing  
Bomb-resistant planes  
Spare parts

## **Part V: Airports**

## **15 Murder most foul**

Rules of the security game

The horror of Pan Am 103  
Security improvements that need to be taken

## **16 Toward safer landings**

Airport disaster preparation  
Runway incursions  
The problem of the aborted takeoff  
General aviation and commercial airports  
Increased airport capacity  
Build or expand

## **Part VI: Man, nature, & safety**

## **17 Practice makes perfect**

Improving human performance  
Preventing pilot fatigue  
Flight data recorder monitoring  
Preventing substance abuse

## **18 Stormy weather**

Aircraft icing  
Severe wind conditions  
Weathering the storms

## **Part VII: Safety first**

## **19 Toward a safer tomorrow**

It's time to regulate  
Reform the FAA  
Repeal the cost/benefit rule  
Strengthen Part 135 regulation

Enhance whistle-blowing protection  
Force the carriers to compete on safety

- 20 Protect yourself  
Self-help  
Become a safety activist  
Coalition of Airline Passengers (CAP)  
Individual advocacy

## **Epilogue**

It is easy to see from the table of contents that this book takes a much broader brush look at aviation safety than the first book reviewed. There are seven parts to the book, twenty chapters, and numerous subchapters. The second thing that stands out from the table of contents is its negativity. If one takes a sampling of the titles of the twenty chapters we see titles like: “Bureaucratic Quicksand, The FAA Follies, They have those Mismanagement Blues, The Controller’s Unhappy Decade, and Troubled Technology” just to mention a few. These titles are emotionally charged and in essence sum up the author’s opinion in a single phrase. They are judgmental and condemning and are meant to imply that our airline aviation system is “unsafe”. The conclusion that the reader is suppose to take away is that the airlines are “unsafe”.

As with the first book, the next step was to look at the introductory and conclusion paragraphs of each chapter. Usually, these paragraphs offer a condensed version of the point the author is trying to make in the chapter. The introductory and conclusion paragraphs of this book did not always contain statements using the words “safe” and “unsafe”. But they did always carry the unwavering message that the airline system is “unsafe”. Often times the language used within the paragraphs represented a more subjective view of aviation safety. They would indeed speak of something as being safer and incremental, but in the end the reader departed each chapter with the feeling that the authors felt that the airline system is “unsafe”.

The authors were not trying to impart the concept that aviation safety is something that is relative and incremental. They wanted the reader to be outraged and accept their view that the

airline system is “unsafe”. Their purpose was to present an argument meant to lead the reader to the objective conclusion that flying within our commercial airline system is “unsafe”. Furthermore they wanted the reader to believe that our government (i.e. bureaucracy) is inept in managing our commercial airline system. This book is really an extensive critique of our commercial aviation system. It is well written and well researched. When it talks about aviation safety and lays out its case on how “unsafe” the airline system appears to be, it does so at times in a very subjective manner. However, in the end it is clear that the authors want the reader to come away with the feeling that airline travel is “unsafe”.

## **SUMMARY OF FINDINGS**

The idea that aviation safety is something finite and achievable represents a core belief and consequently is ontological. The hypothesis of this dissertation is that in terms of public dialog this objectified/reified view of aviation safety represents an underlying ontology. It is not that the entire dialog conforms to this type of rhetoric. In fact, most of the dialog within a particular article conforms to a more professional view of aviation safety that regards aviation safety as something intangible and more incremental. However, when the debate heats up the dialog usually reverts to a tangible view of aviation safety and people begin to speak of aircraft and situations as being “safe” or “unsafe”.

## CHAPTER V

### CONCLUSION

#### DATA REVIEW AND ASSESSMENT

The question posed by this dissertation is whether a basic belief system, labeled an *ontology*, exists concerning the American view of aviation safety. The concept of an *ontology*, as used in this dissertation, is a deeply held set of beliefs; so deeply held and fundamental they are taken to be “true” or “reality” and therefore “given” and “unquestionable”; thus they inform and set the parameters for the discussion and dialogue of aviation safety. The answer to the question posed is that such an *ontology* does exist in aviation safety. Furthermore, the way it frames perceptions and expectations of aviation safety has important consequences. My argument and conclusion is that at a very fundamental level, concepts of aviation safety rest upon the assumption and belief that safety is something objective, definitive and achievable. In the end, this *ontology* causes people to think of flying as “safe” or “unsafe”.

When someone says that a situation is “safe” or “unsafe” it reflects an objectified/reified view of safety. I chose the words objectified/reified because the implication is that being “safe” or “unsafe” is something real. Webster’s dictionary defines the noun *object* as “a thing that can be seen or touched; material thing”. The adjective form of *object* is *objective*, and is defined as “being, or regarded as being, independent of mind; real; actual”. The verb form of *object* is *to objectify*, and is defined as “to give objective form to; make objective; materialize”. Likewise, the verb *reify* has the same implications. Webster’s dictionary defines *reify* as follows: “to regard (something abstract) as a material or concrete thing”. I use the verbs *objectified/reified* because the concept of being “safe” or “unsafe” within the aviation community is presented as

something definable and attainable; and consequently something real. In other words, “safe” and “unsafe” reflect a real state of being.

This is not the only way to think about the issue of safety. For example a much different view of aviation safety is possible, and some would say more realistic, useful and desirable. This alternate view treats the concept of safety as something relative; something which lies at some point along a continuum of “unsafeness”. The fundamental premise of this alternate view is that within the realm of safety something is never completely “safe”. There are professional communities that have adopted such a view regarding safety.

The medical profession offers an excellent example of this way of thinking regarding safety. One will never hear a doctor say that a particular medical procedure is “safe”. On the contrary, the medical profession’s “safety ontology” rests upon the very premise that medical procedures always involve some degree of risk. Doctors are taught to talk and think openly about these risks, and to couch predictions and prognoses in terms of probabilities and percentages of success and survivability. The lengthy release forms that must be signed by patients prior to surgery spell out every conceivable risk associated with that particular medical procedure. Conversely, no such forms are required to be signed by airline passengers before they board an aircraft; nor are the inherent risks involved with flying elaborated upon. The assumption is that “airline flights are safe”.

The auto industry represents another professional community that adheres to a more subjective view of safety. A comparative approach is used in testing and rating the “safety” of various automobile makes and models. Crash tests conducted at various speeds and angles are used to determine how different models of cars withstand the impact. The results are categorized according to assigned classes of automobiles. The idea is that there is a scale that represents degrees of safety. A particular automobile as a result of crash tests is then assigned a safety rating according to the established scale. The implication is never that cars are “safe”, but rather that some cars are “safer” than others. The underlying premise is that no car is completely “safe”. This approach differs radically from that of the airline industry.

By comparing and contrasting the medical profession and automobile industry ontologies with that of the aviation community, the differences become readily apparent. They represent

entirely different conceptions of the realities of safety. Aviation safety is based on the presumption that an objective state of safety is attainable. In other words, flights are either “safe” or “unsafe”. The research and data collected for this dissertation bring this point home emphatically. Time and time again high level government officials responsible for the administration of aviation safety make statements that describe a situation as being “safe” or “unsafe”. These statements go to the very core of beliefs and values concerning aviation safety and represent an *ontology* of aviation safety that has been objectified/reified into “safe” or “unsafe”.

The “safe” and “unsafe” language used within the aviation community is important because it provides a window into the perceived reality and presuppositions that form the foundation of belief concerning aviation safety; and therefore, the foundation of regulating aviation safety. Indeed, the methodological approach adopted for this dissertation rests upon the premise that one’s language use is a reflection of one’s beliefs. The data collected offers a diverse sampling of high government aviation officials using language that depicts an objectified/reified view of safety. The body of language selected for review herein came from written aviation texts to include: *newspaper articles, formal speeches, testimony before Congress, and books.*

The data presented in Chapter Four provided the details for the findings. The data included the number of texts reviewed, the government officials involved, the percentages of statements that contained language reflecting an objectified/reified view of aviation safety, and the hermeneutic interpretations of two books. The detailed findings will not be reiterated here, as they can be easily referenced in the preceding chapter, but the prevalence of an objectified/reified view of aviation safety within various aviation texts is undeniable. The percentages of occurrence of statements may vary somewhat depending upon the category of text. Below is a brief summary of the percentages for the texts that were reviewed.

## SPEECHES

In terms of percentages the data collected shows that forty percent (40%) of Marion C. Blakey's speeches contained a statement, or statements, that reflect an objectified/reified view of aviation safety. In both Robert A. Sturgell and Nicholas A. Sabatini's speeches sixty percent (60%) were found to contain statements that reflect an objectified/reified view of aviation safety. Finally, of Russell G. Chew's five speeches only one contained a statement that reflects an objectified/reified view of safety which yields a percent rate of twenty percent (20%).

## TESTIMONY

In terms of percentages the data shows that forty five percent (45%) of Marion Blakey's testimony contained statements that reflect an objectified/reified view of safety. The testimony of Jane F. Garvey, the previous Administrator, contained forty percent (40%); that of The Deputy Administrator, Robert A. Sturgell, fifty percent (50%); Russel G. Chew, The Chief Operating Officer, showed one hundred percent (100%); and that of Nickolas A. Sabatine, the chief safety official within the FAA, had seventy five (75%). Only Woodie Woodward and William Davis's testimony was free of such statements.

## NEWSPAPER ARTICLES

The end result for the newspaper article search is that of 1071 articles there were 102 articles containing statements that reflected an objectified/reified view of aviation safety. In other words, approximately 10% of the articles reviewed contained statements that reflect an objectified/reified view of safety.

The importance of the above data lies not in the specific percentages, but rather in the fact that statements representing an objectified/reified view aviation safety were found in significant percentages in all four categories of texts. When The Administrator of the Federal Aviation Administration (FAA) and his/her Chief Deputies repeatedly make unequivocal statements that some aspect of aviation is either “safe” or “unsafe” that speaks volumes concerning their world view of safety. The images or messages transmitted to the public clearly reveal an *ontology* based upon an objectified/reified view of safety. As such, the *ontology* of aviation safety considers being “safe” as a definable, and consequently, an attainable state.

The fact that high level government aviation officials repeatedly make statements referencing conditions as “safe” or “unsafe” is the foundation for my argument. When one reads these statements the message is clear and unmistakable: flying is either “safe” or “unsafe”. However, as can be gleaned from the summary of data above, there are differences in the percentages of occurrence among the types of texts (i.e. speeches, testimony, and newspaper articles). This is especially true between the newspaper category and the speech/testimony categories. These differences do not alter or contradict the basic argument of this dissertation, but they do need to be addressed.

A closer examination of these texts leads to a logical explanation which could explain the variances in data. After reading over a thousand newspaper articles it became apparent that the subject of safety never came up in many of the articles. The reason for this is that many of these articles were purely descriptive in nature. For example, an article may have been written about a change in personnel at the FAA Headquarters. This type of article would most likely not address an issue concerning safety; and consequently, would not contain language that reflects an objectified/reified view of aviation safety.

The computer search used to retrieve newspaper articles was rather broadly based. The key words for the search were *aviation safety*. As a result any article that contained either word was retrieved. Consequently, although many of the articles retrieved might have concerned the subject of *aviation*, they did not necessarily address the issue of *safety*; and vice versa. This would tend to skew the percentages, and partially explain the lower percentage for

objectified/reified statements in newspaper articles because the subject of aviation safety often times was never broached in a particular article.

Speeches and testimony, on the other hand, showed much higher occurrence percentages in comparison to newspaper articles. Plausible explanations for these differences can, likewise, be found in some common sense observations concerning the basis and structures of these texts. To begin with, speeches and testimony represent a unique style of communication. Their environment and the ensuing atmospheres for delivery stand in sharp contrast to that of the newspaper article. In addition, their audiences are vastly different, a key factor in determining both the tone and content of the material presented.

By taking a closer look at the generic audience for a speech given by a high level FAA official some generalizations can be gleamed. For example, these audiences are normally filled with people associated with some aspect of aviation. In other words, it is an audience drawn from the institutional field of aviation. As a result, the audience is more likely to be well versed in the issues of aviation, and often times can be considered professionals within the aviation community. For the most part, these audiences can be characterized as “friendly” toward the speaker because of the common bond of profession and shared expertise.

Having an informed and friendly audience are usually two dynamics that FAA officials can count on when preparing speeches to deliver within the aviation community. Also, because of the professional backgrounds and interests of these audiences, the subject of aviation safety is more likely to be a topic of point. All in all, the atmosphere is generally friendly and relaxed because the FAA official is speaking in his/her own “institutional house” to fellow aviation professionals. One last important distinction is the fact that these speeches are prepared texts that have usually been written and reviewed by aviation professionals. Newspaper articles are also prepared texts, but they contain quotes from various officials which were not prepared or pre-thought. These dynamics combine to make for an entirely different type of text, and go a long way in explaining the differences in the data.

A good way to bring this all together might best be achieved by offering an example. Consider that FAA officials sometimes use speeches to give moral support and praise for a job well done to a particular group within the FAA or aviation community. For example, the FAA

Administrator might be giving a speech to a convention of air traffic controllers. The environment is friendly and relaxed, and he/she is delivering a speech to a group that speaks the “institutional language”. The message might be “Hey you people are real professionals; there is no doubt that our system is ‘safe’, and the best in the world. Keep up the good work!”

Likewise, testimony before Congress as a category of text, shares many of the dynamics of speeches, but does differ in some significant ways. In terms of similarities, there are two things to note about the data collected concerning testimony by FAA officials before Congress. First is that the number of texts sampled is the same as that of speeches. In both speeches and testimony, forty (40) examples of texts in each case were selected for review. The second observation is that the speakers in both cases were essentially the same. The four FAA officials that authored our sample speeches also authored testimony samples. The only difference is that in the testimony data three additional FAA officials were used to make up the forty testimonies.

It is important to note these consistencies because it allows a comparison of the forum for the presentation and the audience receiving it. In both speeches and testimonies the speakers were essentially the same, and the parameters followed for collecting the data were identical. Consequently, it seems reasonable that at least some of the differences in results can be attributed to the different forums and audiences. The data collected shows a somewhat higher percentage of statements that reflect an objectified/reified view of aviation safety in testimony before Congress versus speeches.

This slightly higher percentage, I believe, can be partially explained in terms of the different audiences. Also, the environments for the speaker can be quite different in formal speeches and testimony. As mentioned above, the audiences for speeches can generally be characterized as “friendly” and “receptive”. Likewise, Congressional Committees can at times be “friendly”, but the potential for a contentious environment is greater. There are a number of reasons for this phenomenon.

To begin with, the tone of the presentation by FAA officials before a congressional hearing is quite different from the tone presented by those same FAA officials in the role of guest speaker. The specific reason for testimony before Congress can vary, but in general terms FAA officials are there to justify their agency’s actions/performance and to seek funding. They

want to convince Congress that they are indeed “safe” and are acting in the best interest of the public. Statements used for justification are more likely to be couched in an objectified/reified view of aviation safety. In the end, FAA officials want Congress to believe that they are not just “safer” but that they are “safe”!

In addition to *newspaper articles*, *speeches*, and *testimony*; two *books* concerning aviation safety were the last category of texts to be examined. The review of these books differed somewhat from the other three sources (newspapers, speeches, and testimony). It involved a more comprehensive and interpretive approach. Like the other sources, statements within each text that reflected an objectified/reified view of aviation safety were identified and presented. In addition, a hermeneutic approach was used to get a sense of the entire book. This was accomplished by specifically examining the title, table of contents, the introductory and concluding paragraphs of each chapter, the credentials of the authors, and the intended audiences.

A number of literary aspects of each text such as genre, argument types, the use of emotionally charged words, and other literary devices found within each text were also considered in the process. No specific data was collected on these literary aspects. However, they were used in arriving at an overall hermeneutic interpretation of each book. Using all the above I was able to come away from each book with a sense of its ontological roots.

The two books reviewed were selected because they represent opposite ends of the spectrum for books written about aviation safety. The first book was written by an aviation professional for an intended audience of aviation professionals. The scope of the book was narrow and focused on the topic of *crew resource management (CRM)*. The second book was written by two consumer advocates with no particular background in aviation and was targeted for the general public. It was a broad-based book that looked at the entire commercial aviation system.

I would have predicted that the second book, written by consumer advocates, would contain less professional aviation language. I had suspected that it would be more journalistic and emotional in its approach. In fact, it was exceptionally well researched and well written. The language used was very professional and the arguments presented were well constructed and

logical. However, make no mistake, this book was emotionally charged and the authors wanted to lead the reader to one conclusion: *our commercial aviation system is “unsafe” and government administrators responsible for its oversight are inept at best.*

This conclusion was orchestrated, not through the use of emotional language, but rather with selective focus and skillful argument. The authors have a real knack for building an argument and leading the reader down a narrow path. As one of my professors once described a peer “he artfully builds an argument and leads you down a path that gets narrower and narrower as you go until you reach an intellectual cliff and there is nowhere to go but to jump”. Ralph Nader and Wesley J. Smith skillfully employed this approach in their book Collision Course: The Truth About Airline Safety.

The other book was written differently and used another format. To begin with Norman Macleod’s book Building Safe Systems in Aviation: A Crew Resource Management (CRM) Developer’s Handbook addressed a much narrower safety topic. The narrowness coupled with the fact that it was a ‘handbook’ resulted in a more descriptive type of approach. What I found in the end was that the author would be “plowing along” descriptively and then unexpectedly he would include a statement that something was “safe” or “unsafe”.

The core belief on which these two books rest is the assumption that in aviation something is either “safe” or “unsafe”. In terms of intensity, Nader and Smith’s book was much stronger in presenting this premise. This is interesting, because in terms of actual statements that reflect an objectified/reified view of aviation safety there were probably less such statements in Nader and Smith’s book. However, reading their book can lead to only one conclusion: our commercial aviation system really is “unsafe”.

In drawing conclusions from the data and findings from all the textual categories of this research one thing is clear! Everyone involved in aviation, in the end, comes to a judgment that flying is either “safe” or “unsafe”. This includes legislators, public administrators, aviation professionals, and the flying public. Legislators do not want a “safer” system, they want to be able to tell their constituents that because of their thoughtful and diligent oversight we have a “safe” system. Likewise FAA officials are implicitly charged by their enabling legislation to ensure that we have a “safe” commercial aviation system. Pilots, as operators, make that “safe”

judgment every day before accepting a mission and taking off. Finally, the flying public must also decide if a flight is “safe” before boarding. These assessments are the logical culmination of any consideration of aviation safety based upon the present *ontology*.

## **APPLICATION OF THE CONCEPT OF “INSTITUTIONAL ONTOLOGY”**

The hypotheses of this dissertation is that the aviation community’s treatment of the issue of safety reflects an *ontology* which ultimately fosters an “assumed reality” that perceives situations as being “safe” or “unsafe”. When something is considered to be “safe” or “unsafe” it represents an objectified/reified view of safety, where “safe” and “unsafe” represent an “assumed reality” that views these conditions as something real; and consequently, something attainable. What is unique in this work is the concept of an “institutional ontology”, which I define as a collection of fundamental core beliefs. These beliefs are primary in the sense that they are the bedrock for one’s concept of reality (i.e. assumed reality). There are no other beliefs that are more primal, fundamental, or basic than those of the *ontology*. The contention is that within an institution, its vision, mission, goals, objectives and ensuing policies and regulations all stem from a shared *ontology*. That *ontology* represents a shared perception of reality which shapes their shared values, and thus determines which events and conditions are deemed important and worthy of attention and action; and the nature of that attention and action.

If one accepts the hypothesis that within aviation there is such a thing as an “institutional ontology” of aviation safety, then what utility does this concept hold? Two considerations appear pertinent. First, what are the real and potential consequences of this *ontology* within the specific institutional field of aviation? Secondly, can the concept of an “institutional ontology” be generalized; and if so, is there utility and application for this concept in the study of public administration at large?

## First Consideration

The first question involves the examination and subsequent understanding of the specific aviation safety *ontology* outlined in the preceding chapters. If one acknowledges the existence of an aviation safety *ontology* then a valid question becomes: how does this aviation safety *ontology* influence the institutional field of aviation safety, and with what consequences? I propose that the aviation safety *ontology* affects institutional relationships within the aviation community, and is a key element in institutional interaction. The concept of an “institutional ontology” of aviation safety provides a valuable conceptual framework for analyzing and understanding the dynamics between institutions within the aviation institutional field.

Let’s look at one example: the recognizable friction between the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) that occasionally comes to light in the media, and that is often played out in the halls of Congress. Many attribute this friction to the different legislative mandates of these institutions. The FAA has a dual charter to promote the economic viability of the aviation industry, and at the same time, to regulate their “safe” operation. The NTSB, on the other hand, is only concerned with safety.

The FAA must have its eye on two targets. In the American system economic viability and safety are inescapably tied to one another. It is important to remember that commercial aviation is business, and is based on the concept of free enterprise. Therefore, the FAA cannot regulate to the point that the industry is not profitable, nor becomes so expensive as to prohibit the general public from flying. On the other hand, the public must have confidence that the airlines are “safe” before they will commit to air travel. In essence, FAA oversight of safety is tempered by their concern for economic viability. Likewise, economic viability is not possible without public confidence that the airline industry is “safe”. The FAA must juggle these two objectives daily.

The NTSB, as mentioned, is in a more fortunate position of only having to worry about safety. Additionally, they only have authority to examine and determine questions of safety, but are not invested with the power to implement their safety recommendations. Consequently, the cost of implementation is not of significant concern to the NTSB. Their primary concern is to make recommendations for improvements in materials and processes within the aviation industry that will enhance safety. So, when an accident happens the NTSB investigates, and then proposes actions that will unavoidably cost money to implement. By statute the FAA must consider these recommendations and forward written reply to the NTSB, but is under no obligation to implement the Board's recommendations. This sets the stage for some serious finger pointing and institutional friction.

Few would challenge this observation, and many see the potentially conflicting legislative mandates as the root cause of the friction between the FAA and the NTSB. Differing mandates certainly contribute to the friction between the FAA and the NTSB, but I would suggest that an explanation of the cause of friction is more complicated. The FAA/NTSB differences do not negate the *ontology* of aviation safety, rather they exemplify it because the NTSB in search for cause reinforces assumptions that aviation can be made "safe". By exploring the concept of an *ontology* of aviation safety it is possible to offer insight that provides additional grounds for the friction between the FAA and the NTSB.

It is an explanation focused upon core beliefs concerning aviation safety. Within the aviation safety *ontology* the concept of safety is objectified/reified; consequently, circumstances, situations, equipment, and processes are perceived to be, and presented to the concerned public as either "safe" or "unsafe". The logic generated by this ontological view is that accidents are preventable. This is a view held by the general public. Of course accidents are preventable in a general sense, but only to a point. They can never be eliminated or prevented in their entirety.

However, the idea of preventability in its simplest form implies that something was done or something was left undone that caused an accident. Therefore, the question of why certain actions were taken or not taken almost always drives accident dialogue for those who hold an objectified/reified view of safety. In this atmosphere culpability serves as the "holy grail" and is always lurking below the surface in these discussions. Examining the ontological roots of

aviation safety provides a deeper understanding of culpability debates within the aviation safety institutional field. The ideal of culpability applied to aircraft accidents suggests a rationale strongly tied to an objectified/reified view of safety.

An objectified/reified view of safety assumes that a situation is either “safe” or “unsafe”. Consequently, if an accident occurs then it must have occurred because the situation was “unsafe”. If the situation had been “unsafe” the implication is that it was also preventable. Consequently, if it was indeed preventable, then the issue of culpability will surface. This is in essence the *ontology* of aviation safety. It is an *ontology* based upon an objectified/reified view of safety. Recognizing and understanding this *ontology* can shed new light on the relationship between the FAA and the NTSB. The ideas of “safe/unsafe”, preventability of accidents, and culpability when coupled with the concept of competitive statute mandates, contributes to a more sophisticated explanation for the friction that exists between the two institutions. Trying to identify and understand the fundamental beliefs of an institution by giving that effort a name (i.e. ontology) gives direction and focus to an area where attention has been superficial and vague at best in the study of institutions.

Embracing the concept of an “institutional ontology”, and then seeking to define and identify that particular “institutional ontology” should be the starting point for any institutional study. Because the “institutional ontology” is the basis for the institution’s assumed reality it stands to reason that it should be a precursor to any study of institutions. As shown, the *ontology* of aviation safety can be a valuable tool in the description, analysis, and oversight of aviation safety. It provides a unique lens for addressing aviation safety issues, and subsequently enhances our understanding of institutional action.

## **Second Consideration**

The example of the friction between the FAA and NTSB cited above is a good example of how the concept of an *ontology* within an institutional field can contribute to better analysis and understanding of institutions and their behavior. Ontological roots are certainly not the only

factors that drive institutional behavior, but they should be the starting point of analysis. The concept of an “institutional ontology” is valuable because it provides a means to intellectually identify and order core beliefs and values. Ontological roots have always been of concern to institutional scholars, but usually as reference, and generally of peripheral concern. The concept of “institutional ontology”, as presented here, allows independent study of core beliefs and values in their own right. It allows the segregation of basic institutional beliefs as a target for research, and provides an intellectual concept to house these core beliefs and values; and subsequently, use them in analysis.

Looking outside the aviation institutional field, there is potential application and real benefit for the general concept of an “institutional ontology”. As mentioned, it provides a means to focus on core beliefs and values of a particular institution. The value of focusing on core beliefs and values (i.e. ontology) within an institutional field could be considerable. There are a number of plausible areas for the exploration of *ontology* theorizing. In practical terms, the idea of an “institutional ontology” could potentially be useful in contributing to better policies and regulations. *Ontology* is a term used to represent the summation of a set of core beliefs and values. I believe that core beliefs and values are the “life blood” of institutions. They are the fountain from which everything else flows.

The vision, mission statement, goals, objectives, and ensuing policies and regulations of an institution all stem from a core set of beliefs and values (i.e. “ontology”). How could one have a vision that is not based upon some basic belief or value? In my mind a vision is the conceptualization of how to operationalize a belief or value. Likewise, mission statements, objectives, and goals are manifestations of a vision. Policies and regulations are then used to translate these ideas into action. If this is true, then an understanding of the *ontology* of an institution should be the starting point for building the intellectual framework used to examine its policies and regulations. Likewise, the concept of an *ontology* is just as easily applied to a “field of institutions” as presented in this dissertation by the multi-member institutional field/subsystem of aviation safety. Whether considering an individual institution or a field of institutions, the concept is equally valid and useful.

## Case Study

The concept of an *ontology* is vaguely hinted at in some management approaches, but never really pursued or developed. To make this point, I would like to look into and explore one of the more prolific and widely used management approaches: Total Quality Management (TQM). I chose TQM precisely because it does represent one of the more structured, detailed and widely used approaches to management, yet does not address core values. Additionally, TQM was selected because of my familiarity with this concept based on personal experience applying TQM within the United States Air Force (USAF).

W. Edward Deming, considered the father of TQM, was recruited by General Douglas MacArthur to come to Japan to help with post WWII revitalization of the Japanese economy. His successes in Japan did not go unnoticed here, as TQM came into its own in the United States in the 1980s and 1990s. TQM is a very structured and detailed approach to management with a stated goal of performance improvement. TQM is used as an example because it is easy to identify its intellectual starting point.

The Department of Defense (DOD) adopted the approach for application within the Department and the various Armed Services during the late 1980s (TQM Master Plan, DOD, August 1988). The USAF enthusiastically took up the mantle, and Air Combat Command (ACC) led the charge. Within ACC, the 12<sup>th</sup> Air Force to which I was assigned became actively involved in applying TQM to its command. It was an enlightening experience to say the least!

I can remember spending countless hours in sessions with the senior staff (two general officers and eight colonels) being led by a “facilitator” and trying to come up with a two or three sentence *command mission statement*. It was an exercise in futility; trying to get ten senior officers to agree on a simple mission statement was next to impossible, a feat that would likely be as difficult with ten academics. Finally, after three days the Commander (the three star general) slammed his fist on the table and declared: “this is our mission statement so let’s move on to our goals and objectives”. The letter of TQM was perhaps followed, but somehow the spirit was lacking.

The point of this story was in personally experiencing the fact that the starting point for the TQM process was the mission statement. Yet, there was never any discussion of our “institutional ontology” or basic beliefs as the foundation for a mission statement. This is surprising because the military is perhaps more prone to discuss basic values than the business world. Within the military an array of values such as duty, integrity, courage, and honesty are often discussed, included in officer and enlisted efficiency reports, and addressed in military professional education curriculums. Yet, there was no ontological discussion as part of the TQM process recounted above at 12<sup>th</sup> Air Force.

In the business community TQM is a management concept centered upon the idea of “work processes”. It involves an extensive review of work processes at all levels of an organization and then establishing goals and objectives that enhance work process performance. TQM is a management philosophy based upon performance, measurement of performance, and an organizational document, in terms of goals and objectives, that relates to desired performance.

I chose TQM from the large pool of management schemes to make my point because of its extensive use, and the fact that the TQM process is explicit and quite detailed. The relevance of TQM to this dissertation lies with its complete disregard for core beliefs (i.e. ontology) of the institution as a consideration. The formal starting point for the TQM process is usually the development of the mission statement. Sometimes there may be mention of a “vision” by the CEO, but this is often glossed over rather quickly. The serious discussion within TQM begins with the mission statement. Great effort is put forth in generating an organizational mission statement which in turn serves as the basis for developing goals, and subsequently specific objectives to achieve goals. It is a very structured approach to management.

The point is that even within TQM’s detailed and regimented approach there is virtually no ontological consideration. There is no conscious effort to explore the basic belief system of the organization/institution. But, without an examination of fundamental beliefs, and the use of these beliefs as the starting point for organization building, the risk is greater for a disconnect between values and purpose. Any managerial approach or scheme would be better served if the starting point began with an ontological discussion. The concept of an “institutional ontology” provides the intellectual means for that discussion.

Understanding the importance of ontological grounding within institutions and how it affects their policies and procedures is the real practical value of the concept presented in this dissertation, especially within the realm of public administration. Public administration cannot be built upon the business model alone, but must consider democratic governance and public interest as equally, if not more, important. Values are extremely important in the public sphere, yet ontological discourse is rarely the starting point for institution building. I suggest that it should be the starting point.

The practical application of the thrust of this dissertation is in promoting the realization that ontological discourse should be a precursor to any organizational/institutional discourse. By not examining the fundamental and basic values which are inherent in any institution we potentially run the risks of developing counterproductive policies and procedures. Every aspect of an organization/institution should be grounded in its ontological roots.

### **PUBLIC ADMINISTRATION THEORY**

**(The fit of the concept of an “institutional ontology”)**

The value of the concept of an “institutional ontology” within the study of public administration lies in its ability to provide a point of reference for descriptive and analytical pursuits relevant to institutions. The concept of an “institutional ontology” is not theory in the sense that it can explain or predict, but it should be invaluable in building theory that does attempt to explain and predict institutional behavior. The individual policy analyst would surely be better prepared to analyze if he/she had a sense of the fundamental values of a particular organization/institution. After all, values provide the meaning and purpose for organizational/institution existence. Consequently, in order for policy to be effective it must reflect those basic values.

Likewise, it would seem particularly important for public administrators to be consciously aware of the “institutional ontology” of the organization/institution to which they

belong. As government increases in size and complexity so does the discretionary authority of public administrators. Discretion is defined by Webster's Dictionary as: "ability to make responsible decisions... power of free decision or latitude of choice within certain legal bounds". This definition, as most definitions, implies that discretion allows a certain freedom from written law, but at the same time is guided by the principles of laws. Debates concerning the limits and legality of discretionary authority are as old as our Constitution, and will most likely continue as a lively topic of debate. Never the less, the reality is that discretionary authority is the lubricant that allows our vase government to function on a daily basis. If one accepts the inevitability of discretionary authority within government, then it would seem paramount to examine the fundamental beliefs (i.e. ontology) that provide the basis for discretionary decisions.

The concept of an *ontology* within an institution or institutional field has not been capitalized upon. Taking Scott's idea of the cognitive pillar, and the numerous concepts of fundamental beliefs by other scholars, and singling them out for emphasis is the crux of the concept of an *ontology* (Scott, 1995). The literature within the body of public administration theory and organizational theory could benefit from such an emphasis. Additionally, I do not see the concept of an *ontology*, nor its study, as being in conflict or competing with other theories within the field of public administration. There are conceptualizations of "epistemic communities" within fields of institutions (Crane, 1972, Evan, 1981, Haas, 1990); as well as, conceptualizations of "policy networks" (Jordan, 1990, Peters, 1998, Marsh, 1998), "policy subsystems" (Milward, 1982, Wamsley, 1983, Milward & Wamsley, 1985), and "discourse communities" (Cutting, 2000). It has long been recognized that institutions have "cultures" (de Board, 1978, Martin, 2002), and a propensity for "sense making" (Weick, 1995). There is acknowledgement that there is such a thing as "organizational learning" (Argyris & Schon, 1978, Senge, 1990). These are all valid concepts whose intellectual pursuit enhances our understanding of institutions; however, they do not capture the essence of the concept of an "institutional ontology".

An "institutional ontology" represents a concept somewhat distinct form the concepts of: "organizational culture", "epistemic community", "policy network", "policy subsystem", and "discourse community". For example, the concept of "organizational culture" can be

distinguished from the concept of “institutional ontology” by two characteristics. First, a culture does not have the depth of an *ontology*. Indeed, it grows out of an *ontology*. A culture is something that is recognizable and consciously pursued. It deals more with ritual and custom which are behavioral in nature. In essence, a culture is the “acting out” of an *ontology*. A culture could not exist without an ontological base of core beliefs; conversely, in theory an *ontology* could exist without a culture. Second, there can be more than one culture within an institution (i.e. subcultures). However, there can only be one “institutional ontology”. Intuitively and logically, culture and ontology represent two very different and distinct entities.

Likewise, the concept of an “epistemic community” should not be confused with the concept of “institutional ontology”. “Epistemic community” is a concept founded in and related to the idea of knowledge. The word *epistemic* is an adjective derived from the noun *epistemology*. Epistemology is defined in Webster’s dictionary as: “the study or theory of the origin, nature, methods, and limits of knowledge”. As such, knowledge is not the same as belief. Knowledge is based on observation, information, facts, and feelings that have been validated and accepted as knowledge.

The idea of validation and the process of validation are key to the concept of “epistemic community”. The concept centers around the idea that there are individuals within a community endowed with the power to authenticate what serves as knowledge. “Epistemic community” connotes agreement on how we establish truth and knowledge. It involves a process of knowledge building, and establishing truth, fact, and reality. *Ontology*, on the other hand, is concerned with belief. What stands for “belief” is grounded in the ideal of “a leap of faith”. There is no process for establishing belief in the same sense that there is for knowledge. Consequently, belief and knowledge represent two entirely different pursuits.

“Discourse community” represents a concept that is even further removed from the concept of “institutional ontology” than that of “epistemic community”. Discourse by Webster’s definition is: “communication by talking, conversation; communication in general, especially as a subject of study”. The concept of “discourse community” is focused upon who is communicating and has little to do with belief and knowledge as intellectual quest. What is

important in the “discourse community” concept is the who and the how of the communication, and not necessarily the what (belief or knowledge).

“Policy networks” and “policy subsystems” represent concepts similar to that of “discourse communities”, but hold “policy” as the defining criteria. The link between members of the network/subsystem is an interest in, or concern for, a particular policy issue. They do not necessarily have to share a common “ontology”; only an interest in the policy issue. In fact, it is not hard to imagine institutions with differing “ontologies” being members of the same “policy network”. Policy concerns can cut across a wide spectrum of institutions.

Another concept that some might suggest is close to or synonymous with “institutional ontology” is that of “paradigm”. A paradigm, like an *ontology*, is deeply rooted, but is more of an intellectual construction. *Ontology* is fundamental belief, where paradigm is what could be referred to as fundamental method. It is method in the sense that it structures how one attempts to acquire knowledge; and consequently, relates to and shapes epistemology which determines how knowledge is acquired and validated. Paradigm is defined by Webster’s dictionary as: “a pattern, example, or model”. The word itself has grown in terms of what it implies, especially since Thomas Kuhn’s famous work The Structure of Scientific Revolutions. Paradigms can be powerful, but in the end they deal with how we think and not what we take for granted, assume, or believe. This is a distinction worth noting.

With everything being said about what “institutional ontology” is not, it should be recognized that there are hints in the literature suggesting a need for this type of thinking. Perhaps the best example of “ontological awareness” can be found right here in The Center for Public Administration and Policy (CPAP). The “Blacksburg Manifesto”, a nickname for the initiative started at CPAP which calls for a refounding of public administration, recognizes the importance and need for ontological discourse. Both Refounding Public Administration (1990) and its sequel Refounding Democratic Public Administration (1996) are ontologically grounded and driven. In fact, ontological considerations are at the very core of the refounding movement. They provide the reason to refound, the means to refound, and the refounding solution. Realtors are fond of saying “location, location, location”; perhaps public administrators should adopt “ontology, ontology, ontology”.

As the book titles imply, the traditional and evolving American concept of public administration rests upon rocky ontological ground. The refounding initiative recognized that there was indeed an *ontology* of public administration and, more importantly, that the *ontology* was malignant. The refounding books provide a written pathology of public administration, what it takes for granted or assumes, and seeks to alter them. Whether or not it ultimately comes within the public administration theoretic house remains to be seen. The authors of the refounding did not speak of a specific *ontology* of public administration, but their writings unmistakably carry the idea. Instead they spoke of “ontological considerations” and “ontological discourse”, but in my mind they laid out *The Ontology* of public administration. It exists and was the very reason for the refounding initiative. The uniqueness of the “Blacksburg Manifesto” was that for the first time the very ontological foundation upon which American public administration rests was put under a critical eye.

American public administration as both theory and practice has been taken apart, examined, and put back together so many times that it represents the “Mr. Potato Head” of disciplines or field of study. The legitimacy issue has been the impetus for the “Mr. Potato Head” phenomenon, and interest in legitimacy issues will only increase as the practice of public administration expands, as it must. The “Blacksburg Manifesto” put forth the revolutionary idea that perhaps “Mr. Potato Head” is put together correctly, and if there is a problem with legitimacy, then the remedy lies elsewhere. That elsewhere is in ontological considerations.

The “Blacksburg Manifesto”, if nothing else, has reached into the black bag of public administration and pulled out “ontological considerations” and laid it on the table. It looks to “ontological discourse” as the road leading to a refounding of public administration. Thus far the terms “ontological considerations” and “ontological discourse” are conceived of as a means to an end. What I would suggest is focusing on the end result, which could be named an *ontology*. By looking at “ontological considerations” and having a “discourse” the product could become an *ontology*. In this case, *ontology* is considered as a noun, and not merely part of a process. Something that is definable and very real!

I firmly believe that we as individuals, as members of institutions, and as the embodiment of a country, nation, or state are ontologically driven. If this is true, then it seems perfectly

logical and necessary to identify in greater detail exactly what it is that we believe. Actions must be guided by and reflect core values in order to be effective. The concept of institution implies much more than mere organization; institutions are the manifestations of a particular belief system. I use the label *ontology* to characterize these belief systems, these assumptions concerning reality, because it tends to impart some sense of an entity. It suggests something that exists which could be defined and goes beyond a mere collection of vague ideas.

The concept of an *ontology* is equally applicable to single institutions or a field of institutions. The aviation field of institutions was the subject of this dissertation, but the concept could be applied elsewhere. For example, The Federal Emergency Management Agency (FEMA) could have just as easily been chosen. I suspect that there is a set of core values/beliefs that underlie the organizational structure and management philosophy of FEMA. I further suspect that this set of core values is unique to that institution. The concept of *ontology* is a useful characterization that gives form and definition to an otherwise seemingly elusive collection of ideas.

The hypotheses of this dissertation is that the aviation community's treatment of the issue of safety reflects an *ontology* which ultimately leads to and encourages assumptions of reality and perceptions about situations as being "safe" or "unsafe". When something is considered to be "safe" or "unsafe" it represents an "objectified/reified" view of safety, where "safe" and "unsafe" represent an "assumed reality" that views these conditions as something real; and consequently, something attainable. What is unique in this work is the concept of an "institutional ontology", which is defined by a collection of fundamental core beliefs. These beliefs are primary in the sense that they are the bedrock for one's concept of reality (i.e. assumed reality). There are no other beliefs that are more primal, rudimental, or basic which exist below those of the *ontology*. The contention is that within an institution, its vision, mission, goals, objectives and ensuing policies and regulations all stem from a shared *ontology*. That *ontology* represents a shared perception of reality which shapes their shared values, and thus determines which events and conditions are deemed important and worthy of attention and action; and the nature of that attention and action.

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Note: I've added the library call sign at the end of the entry. (*Italicized*)

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## APPENDIX A

### DATA (Newspaper Articles)

#### The Atlanta Journal – The Atlanta Constitution

24 Oct 99 (1)

Military Aviation Proves Slipshod on Safety by Russell Carolls (author)

“I’m beginning to understand how the military deals with this stuff” said James Brouni, whose son was killed when he flew a helicopter that crashed and which Navy investigators later determined was not safe to fly.”

19 Apr 88 (4)

Replace Outdated FAA to Assure Continued Air Safety Panal Says by Bert RoughtonJr./Bob Dart (authors)

“The Federal Aviation Administration (FAA) is lagging behind the explosive growth in air travel and should be replaced with a new independent authority, President Reagan’s Aviation Safety Commission has concluded. After 10 months of investigation, the seven member commission determined that it remains safe to fly but said sweeping changes, including the appointment of a new ‘safety czar’, are needed to keep the shies safe.”

1 Nov 87 (5)

FAA Chief’s Mission, Improve Training, Boast Safety But Critics Say McArtor Fighting Image With Image by Bert Roughton Jr. (author)

“McArtor’s specific goals are detailed in his Impact 88 program. The program is designed to improve the training and qualification of crews, enhance the system’s technology, reassure the public that it is safe to fly and expand airport and airway capacity.”

Same article

“You can mask almost any other statistic with this decline in accidents and the decline in fatalities” he said. “Just because you haven’t had an accident doesn’t mean you run a safe system. You may be running a ucky system”.

12 May 86 (38)

Pentagon Backs Down On New Air Safety Guidelines After FAA Appeal by Scott Thurston (author)

“As the proposal climbed the ladder at the Defense Department FAA Administrator Donald Engan met with Gen. Duane Cassidy, Commander of MAC... I remain convinced that Eastern Airlines is not safe for DOD passengers.”

26 Sep 88 (47)

Take a Step Toward Safer Air Ambulances by Editorial/Staff

“Opponents say regulations are unnecessary, would cause problems on both the enforcement and compliance ends and would drive up the cost of air ambulance service. The result of regulation, they argue, would be to make this emergency service less available. But wouldn’t it be better to have a few safe air ambulance services than many unsafe ones?”

1 Apr 69 (72)

Office Staff Takes Up Tools to Keep Eastern Jets Running by Bert Roughton Jr. (author)

“If the planes weren’t safe, we wouldn’t let them fly” said Roger Myers, a spokesman in the FAA’s Southern region.”

16 Sept 89 (91)

Jetliner Problems Doubled Since 84 On 12 Top Models Fleet Is Aging but FAA Lacks Data to Find Cause of Breakdown Trend by Bert Roughton Jr. (author)

“The choice is yes we’ll do more maintenance more often, which will cost more dollars and use more manpower and lead to more downtime, and we’ll operate safely/”

..

28 Dec 88 (98)

Emergency Landing the Eighth for Eastern Jet in Five Years by Bert Roughton Jr.  
(author)

“Aviation safety experts say the incident comes as airlines are entering an uncharted area of unanswered questions about how long they can expect an airplane to perform safely, as the commercial fleet grows older.”

## **Business Week**

4 Nov 96 (1)

Flight 800: And Now to the Courthouse Lawsuits Are Filed As Probes Zero in on Mechanical Failure by Christina Del Valle, Mike France, Seanna Browler  
(authors)

“Boeing wouldn’t comment on the litigation, but notes that its 747s have a long record of safe flying.”

5 Jul 93 (3)

Boeing For FWant of a Pin...How One Small Defective Part Caused Deadly Havoc by Mark Lewyn, Dori Jones Yang, Neal Sandles, Stewart Toy (authors)

“Boeing says today, all 948 of its 747s in service are safe and that all fuse pins are either new or are being frequently inspected by airlines.”

29 Jul 96 (6)

Dangerous Liaisons? US airlines have ties with some questionable carriers by Christina Del Valle, Stan Crock, Jonathan Moore (authors)

“You don’t sign a code-share agreement with an airline you don’t believe is safe” insists United CEO Gerald Greenwald.

3 Jun 96 (8)

Forced Landing? By Kelly Holland, Christina Del Valle (authors)

“Federal Aviation administrator David Hinson is under fire from consumer advocates, Congress, and from the FAA for not taking a tougher stance to insure safe skies”.

21 Sep 87

International Business: Europe Heads Toward An Air Safety Crisis of Its Own... As Traffic Soars, Antiquated Equipment and Demoralized Controllers Plague Many Countries by Mark Maremont, John Rossant (authors)

“But unless we invest more, we can’t guarantee safety in the early to mid 1990s, when traffic will be up 25% to 30%.”

## **Chicago Sun**

21 Nov 89 (2)

Mental Health Screening of Pilots Debated by Eric Malanic, Ricardo Alonso-Zaldivar (authors)

“What the traveling public wants is a safe flight” said Jim Burin, a director of the Flight Safety Institute in Virginia.”

19 Apr 88 (40)

Airline 'safety czar' urged to replace FAA (no author)

“The present safety regulatory structure is simply inadequate to deal with future growth and technological change... and is not working efficiently enough to ensure safety.” Said aviation safety commission chairman John M. Alberline.

26 Jul 86 (46)

US Probes FAA data at Aurora// Falsification of Air Controller Records Charged by Phillip J. O'Connor, Fran Spielman (authors)

“Meanwhile, FAA officials and airline executives insisted O'Hare (airport) is safe.”

3 Feb 01 (47)

United phases out DC-10s efficiency of Nnewer jets cited; last 3 to be sold for cargo use by Robert C. Herguth (author)

“Despite past design problems that contributed to at least one crash, McKenna described today's DC-10s as ‘absolutely... a safe airplane.’”

11 Sep 94 (74)

Air Experts Back Record Despite Series of Accidents by Mark Brown, Michael Briggs (authors)

“If I thought US Air was an unsafe airline, I would ground the entire fleet today” US Air chairman Seth Schofield said.

13 Dec 94 (85)

Experts Renew Call for FAA Safety Czar by Jeff Brazil (author)

“If you keep score by accidents only, a bald tire is safe until the blowout” said former NTSB official Ira J. Furman.

23 Apr 87 (88)

FAA Slammed on Safety//Watchdog Urges Ceiling on O’Hare Flights by Fran Spilman (author)

“Employees who are doing an excellent job in maintaining a safe and efficient air traffic system are becoming very frustrated” Pollard said in a prepared statement.

“Mr Burnett’s objectives and our objectives are the same – a safe and efficient air traffic control system.” Pollard said.

11 Dec 05 (99)

Are Longer Runways, Better Barriers Needed? By Fran Spielman (author)

“There are a number of airports located in or within close proximity to residential and commercial dwellings. That doesn’t necessarily make those airports unsafe.”

10 Apr 94 (101)

How Can You Be Sure That An Airline is Safe? By James T. Yenchel (author)

“In the face of such a shocking disaster, how can American travelers feel confident that an unfamiliar foreign airline on which they’ve been booked is actually safe to fly?”

14 Dec 96 (104)

Urgent Warning Issued On Jets by Pat Milton (author)

“The Boeing 747’s center fuel tank should be refueled using cooler fuel from underground tanks, and a safe minimum quantity of fuel should be kept in the tanks to prevent volatile vapors from accumulating.”

26 Apr 92 (106)

Small, Aging Airports Draw Renewed Criticism by Bill Cormier (author)

“It’s a safe airport that conducts hundreds of thousands of flights a year” said Bill Cahill spokesman for the Port Authority of New York and New Jersey, which runs La Guardia, John F. Kennedy, and Newark airports.”

12 May 98 (119)

Fly the Aging Skies by Gil Jiminez (author)

“Overall, industry experts said that in 1996, domestic airlines were flying passenger jets that ranged from an average of than 27 years old to some as young as four months. But are they safe? The National Transportation Safety Board has always been more concerned with... maintenance, not age itself” said spokesman Ted Lopalkiewitz.

18 Dec 94 (124)

Crashes Raise Fear of Risk by Larry Wheeler (author)

“The safety board concluded that to ensure passenger safety, small commuter airlines should be held to the same, stringent regulations that apply to large jet fleets. What is going on? Is it safe to fly?”

24 Jul 87 (132)

Airline Executive Wants Return to Federal Regulation by Fran Spielman  
(author)

“ American Airlines chairman Robert L. Crandell urged U.S. Transportation Secretary Elizabeth H. Dole to respond to an ‘enormous public furor’ over safety by ordering a study to determine how many flights the nation’s air traffic control system can handle safely.”

7 Aug 86 (134)

Air Controllers Inexperience Hit in O’Hare Errors by Tim Podgett, Phillip J. O’Connor (authors)

“Chicago FAA spokesman Mort Edelstein, discussing the computer failures, said that the Aurora center handled the normal number of landings and takeoffs, but that traffic was ‘stretched out’ sjo controllers could safely manage it.”

## **Daily News**

2 Nov 00 (16)

Pilot’s Judgement on Takeoffs Was Correct by Bill Egbert (author)

“Conditions were well within safe operational limits” Singapore Airlines spokesman Rick Clements told reporters.

“Measuring safe winds speeds was more complicated, but gusty winds were not excessive, he said.”

27 Nov 99 (19)

Doomed Flier Had 1<sup>st</sup> Class Record by Paul H. B. Shin (author)

“I’m sure that Mr. Jacoby would not be pushing the envelope or doing anything that was unsafe, said Doug McNeeley.”

## Denver Post

1 Aug 02 (4)

Crash Prompts More Scrutiny – Panel to Review Use of Aircraft to Battle Fires  
by Jeffrey Leib (author)

“We’re only 200 days away from the next fire season, I want our people to focus on getting through the remainder of this season safely.”

13 Dec 04 (8)

FAA: Pilot Properly Trained Crash Killed Two on Friday Aviation Officials Defend the Safety Record of the Plane Model and Suspect that More Than Just Engine Trouble Was Involved in the Accident Near Centennial Airport by Marsha Austin (author)

“It is not considered an unsafe aircraft” he said “There are 400 out there flying that have not been involved in accidents”.

4 Aug 02 (9)

Air Tankers Ordered to Trim Loads Reduce Slurry by 15%, Safety Officials Say  
by Jeffrey Leib (author)

“But Morris said he remains confident in the ability of Aero Union’s planes to safely carry the full amount of slurry in their tanks.”

28 Feb 98 (10)

Briefing: Report Positive After Valuejet Crash (no authors)

“The team from the FAA’s National Aviation Safety Inspection Program went over the Air Trans Airlines operations from Oct 20 to Nov 7... there was no indication of improperly trained or unqualified flight crew members nor aircraft operating in an unsafe condition.” The report said.

11 Mar 98 (24)

FAA Free-Training Agreements with Airlines Criticized by Jonathan D. Salant (author)

“Another arrangement prevented an FAA lawyer from imposing on an airline for unsafe practices.”

18 Dec 94 (35)

Airlines Aren’t Flying on a Wing and a Prayer Officials Defend Safety Record by Larry Wheeler (author)

“The NTSB concluded that to ensure passenger safety, small commuter airlines should be held to the same stringent regulations that apply to the large jet fleets. What’s going on? Is it still safe to fly?”

19 Mar 98 (41)

Jet Crash Lawsuits Reach End by Jeffrey Leib (author)

“Boeing spokeswoman Susan Bradley said the aircraft manufacturer believes the 737 is a safe plane and sudden difficulties were not the cause of the Colorado Springs and Pittsburg accidents.”

3 Sept 94 (58)

US Tightens International Air Safety Rules: 13 Nations Subject of Scrutiny by FAA by Associated Press (no author)

“The FAA found that in many cases countries were simply not meeting their international obligations, said Transportation Secretary Federico Pena... Pena said traveling to the listed countries ‘is not necessarily unsafe’.”

29 Jun 04 (90)

Adding to Fires’ Risk Are Tanker Groundings Justifies? By Wendy Beye  
(author)

“He was a conscientious, safe pilot; a flight instructor with 20,000 hours in small aircraft, including many hours of aerial agricultural-application flight”

30 Mar 97 (90)

Firefight Plans Assailed Slurry Bombers Called Dangerous by Robert Kowalski  
(author)

“The Forest Service, meantime, stands by the tanker program. ‘I think the program is a safe one’ said Pat Kelly, the Forest Service’s director of aviation.”

## **Dow Jones News Service**

12 Jan 95 (12)

GAO-FAA-Air Safety – 2- Says Air Travel Generally Safe (no author)

“FAA Administrator David Hinson assured the committee that both they and the public should be reassured that travel on American air carriers is safe and the FAA will aggressively guard the safety of that system.”

9 Apr 98 (64)

Transportation/Safety – 2 To Focus on Plane Takeoff, Landing (no author)

“The FAA is often accused of being cozy with the airlines and other groups it regulates, but all have said they share a common interest is safe air travel.”

29 Sep 98 (71)

FAA Flying Through Its Y2K Computer Renovations (no author)

“Garvey said she’s confident that air travel will remain safe.”

25 Jun 96 (78)

FAA Head – Agency’s Reaction – Hinson to Step Down (no author)

“In his testimony, Value Jet President Lewis Jordan insisted that the airline is safe.”

26 Aug 05

EU Commission: Moving Closer to List of Banned Airlines (no author)

“At the moment, only Switzerland and the U.K. published information on airlines they consider unsafe.”

## **Forbes**

16 May 88 (3)

Fear of Flying as a Bargaining Chip by Howard Banks (author)

“Pan American is in terrible financial shape, but nobody is alleging it is unsafe.”

Same Article

“Safety still gets a higher priority than anything else in the business. It’s a safe airline, after all, that swallows a delay to sort out a maintenance problem.”

**Newsday**

16 Dec 85 (5)

Crash Promotes Scrutiny of Arrow Air’s Records by Tom Incontelupo (author)

“In Miami, Arrow Air spokesman Robin Mattell told the Associated Press: ‘we have never flown an airplane that is not completely safe to fly’.”

2 Oct 85 (8)

Controllers Question Air Safety by Tom Incontelupo (author)

“Herbert McLure, an associate director at the officed, told the Senators that most who responded consider the nation’s air traffic system safe.”

20 Feb 88 (36)

Panel: Make Air Traffic Control Private by Alan Eysen (author)

“Phylis Guss, on the staff of the House Aviation Subcommittee, said that until safety is ensured, congressional movement on the idea would be unlikely.”

Same Article

“Al Werner, manager of Long Island McArthur Airport, said he feared that privatization could mean that the cost of tower maintenance would be passed along from the federal government to local municipalities. Werner said he also feared that turning tower control over to the ‘the lowest bidder’ would be unsafe.”

7 Jun 88 (42)

Aloha Airlines Incident Spurs Aviation Meeting (no )

“ An aviation industry stunned by the in-flight breakup last month of an Aloha Airlines jet began a formal re-examination yesterday of how to ensure that aging aircraft are kept safe.”

10 Jan 87 (47)

Safety Issue Plagues Lorenzo’s Airline Concerns Persist on Watered-Down FAA Audit... After Bankruptcy, A Rush of Mistakes and Violations by Sheryl Fragan (author)

“ There’s a philosophical problem with management and it creates a systemic problem within the carrier – you’re committing unsafe acts and all you need is unsafe conditions to go with it.”

17 Jan 97 (49)

Former controllers Can give FAA a Lift by Bob Harris (author)

“Clinton has a unique opportunity to set a new course for the agency by appointing a new leadership team that will anticipate problems and move quickly to gather Congressional support for providing the agency resources needed to meet its primary mission objective – the safe, expeditious and orderly movement of air traffic.”

2 Jun 88 (59)

Aloha Airlines Incident Spurs Aviation Meeting (no author)

“Rep Dan Gleckman, (D-Kan), suggested that the FAA buy old jetliners and test them to determine when a plane no longer canbe considered safe.”

19 Aug 88 (63)

Panel Revamp FAA, Add Safety Czar by Robin Schatz (author)

“The nation’s air transportation system is safe, for now, John M. Albertine, chairman of the Aviation Safety Commission told reporters in Washington.”

20 Feb 88 (69)

Panel Make Air-Traffic Control Private by Alan Eysen (author)

“ Al Werner, manager of Long Island MacAurther Airport, said he feared that privatization could mean that the cost of tower maintenance would be passed along from the federal government to local municipalities. Werner said he also feared that turning tower control over to ‘the lowest bidder’ would be unsafe.”

15 Dec 65 (90)

Past Problems With Jet Engines; DC-8 that crashed had aborted 2 takeoffs in past 5 months by Martin Weston (author)

“Arrow spokesman Ralph Herz... we have never flown an airplane that is not completely safe to fly. Said Herz.”

14 Dec 85 (91)

Crash Prompts Scrutiny of Arrow Air's Record by Tom Incantalupo (author)

“ In Miami, Arrow Air spokesman Robin Mattell told the Associated Press ‘we have never flown an airplane that is not completely safe to fly’.”

## **Newsweek**

29 Nov 99 (6)

I Put My Trust in God: The co-pilot recited his simple prayer not once, but again as the 767 jetliner plunged into the sea. An exclusive inside report on Flight 990, the Egypt Air vet at the center of the probe and the rising tensions over the key question: was it a suicide? (no author)

“ While increasingly unpleasant, air travel is still safe.”

## **Washington Post**

29 Jul 05

NASA Weighed Program for Shuttle's Foam; Insulation Deemed Safe for Discovery by James V. Grimaldi and Rob Stein

23 Jul 05

Fly: Fine's Size Tied to Earlier Problems; FAA Says Prior Issues Had Not Been Addressed by Bill Brubaker (author)

“The FAA says fly: has complied with government regulations – the airline has a new tracking system now – and is safe to fly. ‘ If it weren’t safe to fly, we wouldn’t let them fly’.”

9 Jun 05

Airline Inspections Called Inadequate; FAA Hasn't Kept Up with Risks Posed by Industry Cost – Cutting, Report Says by Sarc Kehaulani Goo (author)

“ said Kenneth M. Mead, the Inspector General ‘ we don’t want anyone taking inference that we’re saying the system is unsafe’.”

25 Jun 05 (72)

2 Planes Nearly collide at Reagan National, FAA Says May 14 Runway Involved US Airways Jet, Twin-Engine Piper by Don Philips (author)

“Former safety board chairman Jim Burnett, who headed the safety board through most of the 1980s and into the 1990s wrote Transportation Secretary Norman Y. Mineta on April 25 expressing frustration with the FAA... ‘I consider our country’s most congested airports to be unsafe’.”

9 Feb 00 (95)

Safer Skies by James R. Kidd II (author)

“This, after a radar and radio failure at a major FAA facility, the public is exposed to some FAA figure skating ‘ safety was never compromised’.”

25 Jun 96

FAA's Ability to Collect and Use Airline Safety Data Questioned by Iva Chinay  
(author)

“Federal officials say it would be a mistake to try to rank airlines by mishaps or mechanical problems because the public could misread the results and assume that the lowest – ranked carriers are unsafe. The FAA traditionally has insisted that any carrier it allows in the air is safe, period.”

25 May 95

Bogus Aircraft Parts Threat Debated; DOT Inspector General and FAA Officials Disagree on Potential for Safety Program by Don Phillips (author)

“The Transportation Department Inspector General said yesterday that unapproved aircraft parts are proliferating and could devastate aviation safety... The Federal Aviation Administration said the problem, while a concern, is one of the least serious threats to safe flight.”

22 Aug 89

DC-10s and Other Old Jets (editorial)

“Officials say they are not questioning the overall safety of the DC-10 or other jets, including the Boeing 747, Lockheed L1011, and the Airbus 300. Anthony J. Broderick, the FAA's Deputy Administrator for regulation and certification, says the old jumbo jets that fly today are certified by the FAA are safe to fly and provide the safest form of transportation available.”

13 Jul 03

Major US Airlines Complete Safest Year; In 02 Carriers Kept Older Planes on Ground, Cut Back on Less-Experienced Workers by Don Phillips (author)

“Stuart Matthews, president of the Flight Safety Foundation said ‘ Safety in a never-ending task. I’m not going to say the system isn’t safe, but if we don’t pour money into safety, we’ll plateau.”

19 Dec 99

Runway Near Miss Probed; Pilots Averted Crash by Ignoring Controllers by Don Phillips (author)

“Normally, pilots routinely accept instructions from controllers, who have far more information about runway and airspace than the pilots. It is a relationship of mutual trust. However, under federal rules, a pilot has the right to reject any controller instruction the pilot considers unsafe.”

2 Aug 96

Pena Addresses Price of Airline Safety; Terrorism May Force Massive Upgrade of System, Secretary Says by Stephen C. Fehr (author)

“Transportation Secretary Federico Pena told Congress yesterday that current aviation security measures may not be adequate to stop future terrorist attacks and that billions of dollars could be needed for improvement to ensure safe travel.”

19 Jun 96

Tale Spin at the FAA (editorial)

“ Mr Pena added that ‘if Value Jet was unsafe, we would have grounded it’ FAA Administrator David Hinson declared that ‘ the airline is safe to fly, or otherwise we wouldn’t allow it to fly’.”

24 May 96 (206)

What You Don’t Know... Is Hard as Heck to Find Out by Cindy Skrzychi  
(author)

“The Federal Aviation Administration is continually walking a tightrope. By charter, its suppose to both regulate the airline industry and also look out for its economic health. In practice, it tries to keep the industry safe with maintenance directives, inspections and a mountain of aircraft certification standards...”

24 May 96 (206)

What You Don’t Know... Is Hard as Heck to Find Out by Cindy Skrzychi  
(author)

“People look for some quick, easy formula for wheather an airline is safe or not. It does not work that way’ said Ed Perkins editor of Consumer Reports Travel letter.”

17 May 96 (207)

DOT Inspector General Keeps Flying in the Face of Caution by Cindy Skrzcki (author)

“Federal Aviation Administration chief David Hinson has signaled how uncomfortable he is with Schiavo’s indictment of Value Jet. He told an interviewer he was ‘troubled’ that she would think the airline was unsafe, and added coolly that she was ‘entitled to her opinion’.”

15 May 96 (208)

An FAA Bureaucrat Flies Into a Storm of Debate: Comments on Value Jet Drew Criticism by Barbara Vabejda and Judith Havemann (authors)

“As a result of her statements and the unusually public conflict, Schiavo, a Harvard graduate with a law degree and a pilot’s license, has become a controversy herself. ‘She is unjustly scaring the traveling public to think the industry is unsafe’, said Kenneth Quinn, a former counsel for the Federal Aviation Administration now in private practice. ‘To suggest its not safe to fly is irresponsible’.”

24 Oct 89 (223)

Debt’s Impact on Air Safety Is Questioned by Robert E. Dallas (author)

“But do debt burdens compromise safety? Will heavily leveraged airline – should there be a downturn in the economy – be forced to skimp on the maintenance required for safe operations.”

16 Jul 95 (240)

Personal Feud, of Professional Problem? DOT Officials Attack On FAA Veteran Stuns Aviation Community by Don Phillips (author)

“Broderick’s memo said that senior FAA officials and representatives of the engine manufactures concluded that ‘an unsafe condition does not exist with the blades...”

11 Apr 93 (241)

Computer Finds Excess Stress on 747 Parts by Don Phillips (author)

“Uncracked, uncorroded pins are strong enough to support the engine properly, and older pins already are under strict inspection requirements. The FAA, NTSB, and Boeing said the 747’s are safe to fly.”

15 Apr 89 (243)

FAA – Approved Development Near National Called Unsafe by David S. Halzenrath and Nell Henerson (authors)

“We believe that the development proposal is a reasonable plan and that existing rules... are adequate to protect the safety of the public’ said Robert Ziemet, the developer’s general counsel. ‘If it was unsafe, I would think that the FAA would have done something about it a long time ago’.”

23 Oct 03 (260)

FAA to Let High – Flying Planes Get Closer by Don Phillips (author)

“Rather than require at least 2000 feet of vertical separation, airlines, business jets and other aircraft capable of flying above 29,000 feet will be required to fly at altitudes 1,000 feet apart... Federal Aviation Administrator Marion C. Blakey

said it will cost aircraft owners a total of 800 million to install the navigation equipment necessary to allow safe flights at the reduced separations.”

6 Mar 94 (264)

Flying in the Third World: Just How Safe Is It? By James T. Yanckel (author)

“To China’s credit’, says Stempler, ‘the Chinese government openly admits its aviation problems and has announced several new programs to improve flight safety.’ But he expects it will be years before a safe, modern system can be put in place.”

23 Jun 89 (288)

FAA Can’t Pay the Whole Bill for Air Safety (OP/ED)

“The Federal Aviation Administration is responsible for monitoring air safety, and it is doing a good job. U.S. flag carriers are safe to fly, and air travel is one of the safest modes of transportation available.”

16 Oct 89 (291)

Improving the Survival Odds in Air Crashes: Recent Accident Add Urgency to Safety Debate in Which both Lives and Costs Are Weighed by Nell Henderson (author)

“If something is unsafe, it doesn’t matter how much (the remedy) costs,’ McSweeny said. ‘But if a little gain in safety puts a plane out of business, does that make sense.’”

6 May 87 (295)

Traffic Jams – In The Air (OP/ED)

“First, a system already exists to ensure that a ‘busy’ system does not become an ‘unsafe’ system. This system, known as ‘flow control’ saved our country’s air transportation system in the aftermath of the air traffic controller’s strike in 1981 and works today to ensure that aircraft do not get so close as to be dangerous.”

3 Feb 05 (312)

Jet Skids Off Runway on Takeoff; Plane Crosses Road and Hits Warehouse; Injuring 16 in N.J. by Sara Kehaulni Goo (author)

“Safety officials were expected to also investigate the plane’s maintenance records and whether its wing flaps were improperly set or whether there were blockages in the plane’s pitot tubes, or speedometers that tell the pilot when it is safe for liftoff.”

25 Jun 01 (319)

2 Planes Nearly Collide at Reagan National; FAA Says May 14 Runway Incident Involved US Airways Jet, Twin Engine Piper by Don Phillips (author)

“I consider our country’s most congested airports to be unsafe’ Burnett wrote ‘they will remain unsafe until remedial action is taken.”

25 Jul 97 (336)

Airport Safer Inside but Not Outside, Critics Say; Short runways and Densely Populated Surroundings Remain Issues at National by Alice Reid (author)

“We need to be closer to the perfect pilot to fly in here... National is a safe airport, but it has shorter runways’ said Bob Davis a pilot who flies in and out of National and heads the safety committee of the Air Line Pilots Association.”

26 Jan 95 (350)

Open Hangers and a High Profile; As Crash Hearings Continue; US Air Invites Media to Pittsburg Base by Don Phillips (author)

“At the hanger, Robin Wahnjigl, US Air’s vice president for heavy maintenance, told reporters that ‘our primary responsibility is to operate a safe airline.”

4 Jun 87 (375)

Don't Worry the FAA Man Said by Laurce Parker (author)

“Don't worry, everything is safe,' came that reassuring drawl.”

11 Jul 87 (378)

Crew in Near – Collision tried to Cover It Up Sources Say; Military Jet Taped talk Between 2 Planes by Sarah Helm (author)

“These procedures allow a pilot to be given immunity from disciplinary action if he reports an ‘unsafe incident’ and no independent evidence of the incident becomes available to authorities.”

3 Aug 86 (385)

Air Traffic Control: System Under Stress 81 Strike Still a Drag on Air Traffic Monitors by Douglas B. Feaver (author)

“The air traffic control system ‘is not safe’, said GAO’s Charles Cotton, whose office supervised the survey and constantly studies the FAA. However, the level of safety has diminished. That opinion is shared at the National Transportation Safety Board, on Capitol Hill and by some safety consultants. It is contested by the FAA and the airlines, which have an enormous economic stake in continued growth, dependent in large part on a public perception that flying is safe.”

26 Dec 94 (403)

Analysts Urge FAA to Close National, Citing Need to Protect White House, Agency Dismisses Proposal, Says Airports Proximity Not an Issue by Stephen C. Fehr (author)

“Shutting down the 53 year old airport, which is three miles south of the White House, has been suggested before by groups who said they believe that National is too noisy or unsafe.”

“Although agreeing that National is more challenging to pilots, John Major, a spokesman for the Air Line Pilots Association, said the airport is safe and should remain open despite the recent crash at the White House.”

7Dec 97 (420)

Computerization of FAA Service Centers Debated by Nell Henerson (author)

“The plans to close the stations is ‘unsafe’; it’s a scandal’ said John L. Baker, president of the Aircraft Owners and Pilots Association (AOPA) a lobbying group for private aviation. ‘Its just a total disaster.’”

2 Jun 97 (429)

FAA Vigilantism (Letter to Editor)

“Safety is achieved through technological advances by the manufactures, training and supervision by the airlines’ management and the discipline care and capabilities of pilots, mechanics and controller staff.”

19 Jun 96 (432)

Take Spin at the FAA (editorial)

“Right after the horrifying crash of Valuejet Flight 592 in the Everglades, Transportation Secretary Federico Pena assured the world, ‘this airline is safe.’”

**Pittsburg Post-Gazette**

19 Jun 96 (13)

FAA Urged to Focus on Only Safety Agency’s Top Safety Chief Ouits: Contract Maintenance Rechecked by Matthew L. Wald (author)

“Pena said again yesterday that US aviation is the safest in the world and briefly defended his assertion fight after the crash that Valuejet was safe.”

13 Sep 99 (24)

Still Unsafe? NTSB Says Repairs After USAir Crash Aren’t Enough by Bryron Acohido

13 Feb 94 (30)

Stale Air on Planes: Passengers Health Complaints Take Off by Jane Kay (author)

“People expect safe and healthy air to be included in the price of a ticket, but it’s not.”

11 Nov 99 (36)

Air Crash Raises Safety Concerns (no author)

“The company came under criticism in September by the aviation pilots union, ASPA, which accused it of flying unsafe ‘scrap metal.’”

**APPENDIX B**  
**DATA (Speeches)**

**Administrator (Marion C. Blakey)**

Speech #1 (none)

Source: "Funding the Second Century of Aviation". Reauthorization Press Briefing. Washington D.C. 14 February, 2007.

Speech #2 (none)

Source: "Experience Counts". National Press Club. Washington D.C. 30 January, 2007.

Speech #3 (para 1)

*"Aviation is an international lifeline, and the people who can make it safe and efficient and environmentally friendly are here in this room."*

Source: "Tribute to Taieb Cherif". IATA Reception. Washington D.C. 18 December, 2006.

Speech #3 (para 5)

*"You play a vital role in making the world's system safe and efficient."*

Source: "Tribute to Taieb Cherif". IATA Reception. Washington D.C. 18 December, 2006.

Speech #4 (para 5)

*"The design and manufacture of the A-380 is a classic case of 21<sup>st</sup> century engineering... Today we're saying that this aircraft is safe for flight."*

Source: "Born to Fly". A-380. Toulouse, France. 12 December, 2006.

Speech #5 (none)

Source: "Tribute to Scott Crossfield". Engen Trophy Presentation. Washington D.C. 28 November, 2006.

Speech #6 (none)

Source: "You Need to Know What You Don't Know". AERO Club. Washington D.C. 28 November, 2006.

Speech #7 (none)

Source: "US and India: Key to Our Success Is You". Society of Indian Aerospace Technologies and Industries. Washington D.C. 16 November, 2006.

Speech #8 (para 36)

*"With our WAAS and your GAGAN working in sync, we could literally have a safe, seamless system all the way from India to the United States."*

Source: "US and India: Bringing the Raga of Aviation to Life". Federation of Indian Chambers of Commerce and Industry. Delhi, India. 13 November, 2006.

Speech #9 (none)

Source: "Safety is Not a Cliché". AOPA EXPO 2006. Palm Springs, CA. 10 November, 2006.

Speech #10 (para 33)

*"In any event, we know, just as it says in the Flight Plan itself, that Moving America safely is what we do."*

Source: "Excellence 24/7/365". Town Hall Forum. Washington D.C. 8 November, 2006.

Speech #11 (para 2)

*“The task of moving people and goods safely and efficiently and securely from point A to point B isn’t easy.”*

Source: “Dig Deep”. International Safety Forum Safety Challenge. Washington D.C. 2 November, 2006.

Speech #12 (none)

Source: “Whose Driving Your Plane”. Great Falls Runway Dedication. Great Falls, MT. 31 October, 2006.

Speech #13 (none)

Source: “Who’s Afraid of a Billion”. ATCA’s 51<sup>st</sup> Annual Conference. Washington D.C. 30 October, 2006.

Speech #14 (para 19)

*“We’re talking about the ability of aircraft across the globe to transit safely and seamlessly across regional boundaries.”*

Source: “The Time is Now”. International Aviation Women’s Association. New York, N.Y. 24 October, 2006.

Speech #15 (para 16)

*“Safety first. I’ve said this a number of times in a variety of settings, and it’s always on point: If it’s not safe, it’s not going to fly. Period.”*

Source: “All Systems Go”. X-Prize II. Las Cruces, N.M. 19 October, 2006.

Speech #16 (para 22)

*“We’re talking about the ability of aircraft across the globe to transit safely and seamlessly across regional boundaries.”*

Source: “Pivot Point”. Chicago Leadership Summit. Chicago, IL. 19 October, 2006.

Speech #17 (para 14)

*“The new controller contract we put in place saves nearly two billion dollars over five years while giving us new managerial flexibility to safely manage the system and better serve you, our customer.”*

Source: “Keeping Pace with Change”. National Business Aviation Association. Orlando, FL. 17 October, 2006.

Speech #18 (none)

Source: “Setting the Pace for Safety”. AUS ISO 9000. 16 October, 2006.

Speech #19 (none)

Source: “Supporting the Front Lines”. FAA Managers Association’s 26<sup>th</sup> Annual Conference. Las Vegas, NV. 6 October, 2006.

Speech #20 (none)

Source: “When Aviation is a Lifeline Literally”. Combined Federal Campaign Kickoff. Washington D.C. 3 October, 2006.

Speech #21 (none)

Source: “A Time for Transition”. Airports Council International-North America. Reno, NV. 26 September, 2006.

Speech #22 (none)

Source: “Let’s Get This Thing Built, Shall We?”. St George Utah Airport Grant. St George, UT. 25 September, 2006.

Speech #23 (none)

Source: “Xieshou Bingjin-Walk Together Hand in Hand”. US-China Aviation Summit. Washington D.C. 18 September, 2006.

Speech #24 (para 5”

*“You’re the reason why Americans can board a plane and know that they’ll get there safely.”*

Source: “Take a Bow. This is Your Moment”. Flight Standards National Recognition Ceremony. Washington D.C. 13 September, 2006.

Speech #25 (none)

Source: “Consistency Leads to Safety”. AVS Manage Meeting. Washington D.C. 12 September, 2006.

**Deputy Administrator (Robert A. Sturgell)**

Speech #1 (para 17)

*“Safety. That’s our goal. The runways have got to be safe, and I’am happy to say we’re making progress in reducing the most serious types of runway accidents.”*

Source: “Yes, Charlotte, There is a Santa Claus”. Charlotte/Douglas International LOI. Charlotte, N.C. 18 December, 2006.

Speech #2 (none)

Source: “A Level Playing Field for All”. American Association of Airport Executives Disadvantaged Business Enterprises Conference. Washington D.C. 11 October, 2006.

Speech #3 (para 18)

*“Simulators – they’ve completely changed the way we train. They provide a safe and realistic classroom and laboratory with hands on experience with real time problems.”*

Source: “Unsurpassed Training Starts Right Here”. International Aviation Training Symposium. Oklahoma City, OK. 18 July, 2006.

Speech #3 (para 34)

*“I look out at the people who are here under the auspices of the Safe Skies for Africa program.”*

Source: “Unsurpassed Training Starts Right Here”. International Aviation Training Symposium. Oklahoma City, OK. 18 July, 2006.

Speech #4 (para 13)

*“Together, what we strive for everyday – safe and efficient air travel – connects us with each other and with the world community.”*

Source: “Black History: A Celebration”. Black History Month. Washington D.C. 7 February, 2007.

Speech #5 (none)

Source: “Helping Madison Takeoff”. Madison Municipal Grant Announcement. Madison, IN. 18 September, 2006.

## COO (Russell G. Chew)

### Speech # 1 (none)

Source: “An Integrated Strategy: Safety, Capacity and Productivity”. ATCA Conference. Washington D.C. 1 November, 2006.

### Speech #2 (none)

Source: “Congested Skies”. ICAO Conference. Montreal, Canada. 28 September, 2006.

### Speech #3 (none)

Source: “Aviation Safety Alliance Newsmaker Breakfast”. Washington D.C. 23 June, 2004.

### Speech #4 (para 1)

*“Administrator Blakey sends her warmest regards and sincere thanks for all the work you do to keep America flying safely and efficiently.”*

Source: “AAAE/ACI-NA Summer Legislative Conference”. Washington D.C. 12 July, 2004.

### Speech #5 (none)

Source: “Improving the Delivery of Air Traffic Services: A Customer-Driven Approach for Measuring Performance”. Pacific Grove, CA. 29 January, 2004.

## **Associate Director for Safety (Nicholas A. Sabatini)**

### Speech #1 (para 29)

*“Management concepts that use performance based navigation surveillance , and communication capabilities, improve operating efficiencies, and craft reduced separation standards that will safely accommodate the huge increase in demand over the next 20 to 30 years.”*

Source: “Flying Into the Future”. FAA New Technologies Workshop. Arlington, VA. 9 January, 2007.

### Speech #2 (para 27)

*“Engineers must – and as the certificating authority, FAA must – make sure that the technology that is developed and deployed is SAFE.”*

Source: “Keynote Address”. Bombardier Learjet Safety Standdown 2006. Wichita, KS. 4 October, 2000.

### Speech #2 (para 53)

*“That’s the point of the clip I showed today – a safe ending because of vigilant pilots – pilots who are not complacent when they are on the job.”*

Source: “Keynote Address”. Bombardier Learjet Safety Standdown 2006. Wichita, KS. 4 October, 2000.

### Speech #3 (none)

Source: “Downward Pressure on the Accident Rate”. International Society of Air Safety Investigators. Herndon, VA. 12 May, 2006.

### Speech # 4 (none)

Source: “Point-Zero-Two-Two: The Challenges to Improving Aviation”. Washington D.C. 25 March, 2004.

Speech #5 (para 33)

*“As you use technology to safely add incremental – and then significant – capacity to the system.”*

Source: “These Are the Days: Designing the Next Generation Air Transportation System”. American Institute of Aeronautics and Astronautics. Wichita, KS. 27 September, 2006.

Speech #5 (para 53)

*“As we move surely, steadily and safely to a performance-based NAS.”*

Source: “These Are the Days: Designing the Next Generation Air Transportation System”. American Institute of Aeronautics and Astronautics. Wichita, KS. 27 September, 2006.

## **APPENDIX C**

### **DATA (Testimony)**

#### **ADMINISTRATOR**

##### Testimony #1 (none)

Source: Before the House Appropriations Committee. Subcommittee on Transportation, Housing and Urban Development. 22 March, 2007.

##### Testimony #2 (para 18)

*“Safety regulation and oversight that are not recovered by user fees, because these regulatory functions benefit the general public by contributing to a safe and reliable air transportation system.”*

Source: Before the House Transportation and Infrastructure Committee. Subcommittee on Aviation. 14 March, 2007.

##### Testimony #3 (none)

Source: Before the Senate Commerce Committee. Subcommittee on Aviation. 15 February, 2007.

Testimony # 4 (para 12)

*“The FY 2008 budget requests 12.8 million for Commercial Space Transportation to continue its commitment to timely and responsive licensing and regulatory processes designed to enable a safe, secure, efficient and internationally competitive U.S. space transportation industry.”*

Source: Before the House Committee on Transportation and Infrastructure.  
Subcommittee on Aviation. 14 February, 2007.

Testimony #5 (none)

Source: Before the Senate Committee on Commerce, Science, and Transportation.  
Subcommittee on Aviation. 25 July, 2006.

Testimony #6 (none)

Source: Before the Senate Appropriations Committee. Subcommittee on Transportation,  
Treasury, the Judiciary and Housing and Urban Development. 4 May, 2006.

Testimony #7 (none)

Source: Before the Senate Commerce, Science and Transportation Committee.  
Subcommittee on Aviation. 28 March, 2006.

Testimony #8 (none)

Source: Before the Senate Commerce Committee. Subcommittee on Aviation. 17  
November, 2005>

Testimony #9 (para 1)

*“As you know safety is and will always be the FAA’s top priority. Every decision we make is done with the safety of the flying public in mind. The system must be safe, as you know, and we deliver a remarkably safe system.”*

Source: Before the Senate Committee on Commerce, Science, and Transportation.  
Subcommittee on Aviation. 26 May, 2005.

Testimony #10 (para 33)

*“Even so, we still must become even more globally focused to ensure that U.S. citizens can travel safely around the world.”*

Source: Before the House Appropriations Committee. Subcommittee on Transportation. 11 May, 2005.

Testimony #11 (para 14)

*“I can assure you, on behalf of the Secretary, that we will closely monitor the changing situation at this critical facility and will use all tools available to us to safely manage the demands.”*

Source: Before the House Committee on Transportation and Infrastructure. Subcommittee on Aviation. 13 May, 2004.

Testimony #12 (para 8)

*“The increased workload also doesn’t factor in the simple and direct costs of our aging – safe, but aging – infrastructure.”*

Source: Before the House Subcommittee on Financial Health of the Trust Fund. 5 May, 2004.

Testimony #13 (none)

Source: Before the Senate Appropriations Committee. Subcommittee on Transportation. 22 April, 2004.

Testimony #14 (none)

Source: Before the House Committee on Appropriations. Subcommittee on Transportation. 17 March, 2004.

Testimony #15 (para 10)

*“Second, let me discuss another area of misconception – the safety record of contract towers. Again the facts speak for themselves – these towers are safe.”*

Source: Before the House Committee on Appropriations. Subcommittee on Transportation. 24 September, 2003.

Testimony #16 (none)

Source: Before the Senate Committee on Commerce, Science, and Transportation. 10 April, 2003.

Testimony #17 (para 2)

*“I have had the privilege to lead an agency whose mission is second to none – ensuring the safety of our Nation’s aviation system.”*

Source: Before the House Committee on Appropriations. Subcommittee on Transportation, Treasury, and Independent Agencies.

Testimony # 17 (para 19)

*“As FAA provides a safe and efficient aviation system that contributes to national security, promotes economic growth and encourages the recovery of civil aviation.”*

Source: Before the House Committee on Appropriations. Subcommittee on Transportation, Treasury, and Independent Agencies.

Testimony #18 (para 9)

*“While FAA’s primary mission is to ensure a safe and efficient NAS we also take our environmental responsibilities quite seriously.”*

Source: Before the House Committee on Transportation and Infrastructure. Subcommittee on Aviation. 27 March, 2003.

Testimony #19 (none)

Source: Before the House Committee on Transportation and Infrastructure. 27 March, 2003.

Testimony #20 (para 7)

*“Our safe system can become even safer if FAA can get in front of accidents by using data to detect problems and disturbing trends.”*

Source: Before the Senate Committee on Commerce, Science, and Transportation. 11 February, 2003.

**Robert A Sturgell**

Testimony #1 (none)

Source: Before the Senate Committee on Commerce, Science and Transportation. Subcommittee on Aviation. 22 March, 2007.

Testimony #2 (para 10)

*“FAA is a member of the National Capital Region Coordination Center (NCRCC) a group comprised of representatives of security and military agencies to ensure that in the event of a threat from an unidentified aircraft, coordinated action can be taken to appropriately address the threat and keep the region safe.”*

Source: Before the House Committee on Government Reform and Oversight. 21 July, 2005.

## **Woodie Woodward**

### Testimony #1 (none)

Source: Before the Senate Commerce Committee. Subcommittee on Aviation. 25 February, 2003.

### Testimony #2 (none)

Source: Before the Senate Committee on Commerce, Science and Transportation. 21 March, 2002.

## **Russell G. Chew**

### Testimony #1 (para 5)

*“One of the core responsibilities of the ATO is to ensure the safety of the users by maintaining the proper separation of aircraft; and the failure to maintain this separation is called an operational error.”*

Source: Before the House Committee on Transportation and Infrastructure. Subcommittee on Aviation. 21 June, 2006.

### Testimony #1 (para 17)

*“We must also make sure we are using the best technology to maintain a safe and efficient air traffic system.”*

Source: Before the House Committee on Transportation and Infrastructure. Subcommittee on Aviation.

Testimony #2 (para 6)

*“When it comes to the ATO’s goals for a safe and reliable air traffic system, we must succeed. Much of the nation’s economy depends on a safe, secure and reliable air transportation system.”*

Source: Before the House Committee on Transportation and Infrastructure.  
Subcommittee on Aviation. 7 April, 2005.

Testimony #2 (para 8)

*“Finally, we must make sure we are using the best technology to maintain a safe and efficient air traffic system.”*

Source: Before the House Committee on Transportation and Infrastructure.  
Subcommittee on Aviation. 7 April, 2005.

**Nicholas A. Sabatini**

Testimony #1 (para 2)

*“Let me start by stating the obvious, the system is safe.”*

Source: Before the House Committee on Transportation and Infrastructure.  
Subcommittee on Aviation. 29 March, 2007.

Testimony #2 (para 1)

*“Very Light Jets (VLJs) and Unmanned aircraft (UAs) are examples of the on-going evolution of the aviation industry, and the FAA working closely with the aviation industry, will develop safety standards and operating procedures to ensure their safe integration into the NAS.”*

Source: Before the Senate Committee on Commerce, Science and Transportation.  
Subcommittee on Aviation. 28 September, 2006.

Testimony #2 (para 10)

*“So for we have discussed FAA’s current efforts regarding certification and regulation of VLJs and UAs as we enable the safe introduction of these new aircraft into the NAS.”*

Source: Before the Senate Committee on Commerce, Science and Transportation. Subcommittee on Aviation. 28 September, 2006.

Testimony # 2 (para 17)

*“We must also make sure we are using the best technology to maintain a safe and efficient air traffic system.”*

Source: Before the Senate Committee on Commerce, Science and Transportation. Subcommittee on Aviation. 28 September, 2006.

Testimony #3 (none)

Source: Before the House Committee on Transportation and Infrastructure. Subcommittee on Aviation. 20 September, 2006.

Testimony #4 (para 6)

*“The COA and Experimental Airworthiness Certificate process are designed to allow a sufficiently restricted operation to ensure a safe environment.”*

Source: Before the Senate Committee on Commerce, Science and Transportation. 13 July, 2006.

Testimony #5 (para 1)

*“The FAA has established an Unmanned Aircraft Program Office which has the expressed purpose of insuring a safe integration of UAs into the NAS.”*

Source: Before the House Committee on Transportation and Infrastructure. Subcommittee on Aviation. 29 March, 2006.

Testimony #6 (para 4)

*“Pilots use their eyes to obtain the vast majority (approximately 80%) of all the information needed to safely fly an aircraft.”*

Source: Before the House Committee on Transportation and Infrastructure.  
Subcommittee on Aviation. 15 March, 2005.

Testimony #7 (para 4)

*“These government functions may require aircraft to be operated in a manner that is beyond what the FAA may consider to be safe for civil aviation.”*

Source: Before the Senate Committee on Commerce, Science and Transportation. 2 June, 2004.

Testimony #7(para 8)

*“Whether or not FAA is primarily responsible for the safe operation of public aircraft, we know that our expertise in aviation safety is invaluable.”*

Source: Before the Senate Committee on Commerce, Science and Transportation. 2 June, 2004.

Testimony #8 (none)

Source: Before the House Committee on Transportation and Infrastructure.  
Subcommittee on Aviation. 11 April, 2007.

## **Jane F. Garvey**

### Testimony #1 (none)

Source: Before the House Committee on Transportation and Infrastructure. Subcommittee on Aviation. 16 July, 2002.

### Testimony #2 (none)

Source: Before the Senate Committee on Appropriations. Subcommittee on Transportation. 16 April, 2002.

### Testimony #3 (para 4)

*“We are continuing our efforts to provide a safe and efficient National Airspace System (NAS), and we must address the unfinished business from last year regarding capacity.”*

Source: Before the House Committee on Appropriations. Subcommittee on Transportation. 13 March, 2002.

### Testimony #4 (para 3)

*“But we must recognize that additional precautions, enhanced awareness, and improved security are essential to make travel safe and everyone has a role to play.”*

Source: Before the Senate Committee on Government Affairs. 14 November, 2001.