

CHAPTER 11: ETHICS IN MAINTENANCE

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LANDING PAGE

Members of the flying public, flight crews, and their families routinely put their trust in the people who maintain commercial aircraft. This confidence in the abilities of aircraft maintainers has a solid basis in fact, experience, and statistically safe performance. Inherent in that trust, is the idea that the people who maintain aircraft and those who manage and regulate those maintainers will always do the “right” thing when it comes to ensuring the airworthiness of the aircraft on which we fly. For the overwhelming majority of maintenance decisions made each day, the people responsible for aircraft safety do the right thing—even at the cost of delays, lost revenue, and job security.

Doing the right thing implies that the thousands of decisions made each day are based on a solid moral and ethical foundation. However, in addition to being a professional vocation, aviation maintenance is also a business that is conducted and managed by people. As such, it is subject to the same personal, political, and financial pressures that often result in same poor decision-making we’ve seen in other businesses.

The study of ethics has a very long history, which is ample evidence of the general interest in the topic. Because ethical behavior has been extensively examined, there exists a commonly accepted framework within which aviation maintenance decisions and tasks can be evaluated.

This chapter describes some of the fundamental concepts related to ethical decision-making and job performance. It also relates these concepts directly to the aviation maintenance environment and uses some examples to illustrate the forces that drive maintainers and managers towards and away from making ethical decisions.

INTRODUCTION

From an airline operations perspective, aircraft maintenance is not a revenue-producing activity. Anytime an aircraft is on the ground, it is not producing revenue. Therefore, there tends to be a significant amount of pressure (either implicit or explicit) on the maintenance personnel—whether within the airline organization or at a third-party repair station—to minimize the ground time and release the aircraft back in revenue service.

There are three groups with primary responsibility for aircraft maintenance: Aircraft maintenance technicians/engineers (AMTs), maintenance managers, and regulators. While all three groups have an overriding goal of ensuring airworthiness of the aircraft, each has a different perspective, as noted below.

- AMTs have a professional responsibility to ensure the airworthiness of the aircraft.
- Maintenance managers are responsible for minimizing the aircraft downtime
- Regulators are responsible for ensuring compliance with legal requirements

The responsibilities of these groups are not mutually exclusive. Most of the time, the groups work harmoniously and everyone is comfortable with the fulfillment of each other's roles and responsibilities. However, there are times when safety and productivity goals clash. Under such circumstances, if the AMTs decide to “hold the line” on all the maintenance standards, they tend to escalate the maintenance expenses. This might threaten the financial viability of the organization. On the other hand, if the managers decide to “hold the line” on the production schedule, they might put the passengers, employees, and ultimately the company at risk. Typically, the regulators do not know about the maintenance compromises because it is impossible for them to oversee the thousands of individual maintenance actions. Since regulators tend to get their information from maintenance records, which are reviewed after the maintenance has been completed, there is always a level of inherent risk on part of the regulator.

The purpose of this chapter is to present some fundamental concepts about ethics, apply them to the real world of aviation maintenance, and help maintainers, managers, and regulators understand and support each other's roles and responsibilities from an ethical perspective.



REGULATORY REQUIREMENTS

The ethical basis of safety in aviation is reinforced by a series of regulatory requirements. These regulations vary somewhat from country to country. For example, in the United States, the aircraft designers and manufacturers are required to demonstrate compliance with 14CFR § 23 or 25 for general aviation or transport category airplanes, respectively. Next, the operators (airlines) are required to maintain the airplanes in accordance with the requirements of §121.363 or 135.413. Next, the individual aircraft mechanics, inspectors, and repairmen are expected to perform maintenance actions in accordance with the privileges and limitations specified in 14CFR §§ 65.81, 65.95, and 65.103, respectively.

In general terms, the role of AMTs is to ensure that the aircraft on which they perform maintenance conform to the applicable airworthiness requirements. The role of the airline is to ensure that sufficient infrastructure exists for proper maintenance of its aircraft. Regulators are required to report any unsafe conditions or acts and have the authority to ground the aircraft. Per 14CFR 43.12, falsification, reproduction, or alteration of maintenance records is prohibited. Per 14CFR 43.13, maintenance personnel are required to use approved maintenance publications when performing maintenance; therefore, failure to follow approved maintenance procedures is a regulatory violation. The AMTs and the regulators are primarily entrusted with the safety of the aircraft.

In Canada, the responsibilities of the individual maintenance engineers, operating certificate holders (airlines) and regulators are similar to those in the United States, but there is one notable exception: the “Accountable Executive”. The amendment to CAR 106.02 established the requirement for all air operators and approved maintenance organizations to designate a particular Accountable Executive who will be responsible for discharging the safety responsibilities of the certificate holder. The regulatory emphasis and the requirement for this individual to accept responsibility via a signed statement brings a higher level of visibility and accountability.

In addition to the basic maintenance standards, according to the European Aviation Safety Agency (Part 66.B500), a maintenance technician/mechanic/engineer’s certification could be revoked if one of the following conditions exists:

- Failure to carry out requested maintenance combined with failure to report such fact to the organization or person who requested the maintenance.
- Failure to carry out required maintenance resulting from own inspection combined with failure to report such fact to the organization or person for whom the maintenance was intended to be carried out.
- Negligence in maintenance actions
- Falsification of the maintenance record.
- Issuance of a Certificate of Release to Service (CRS) knowing that the maintenance specified on the CRS has not been carried out or without verifying that such maintenance has been carried out.
- Carrying out maintenance or issuing a CRS when adversely affected by alcohol or drugs.

Clearly, FAA, Transport Canada, and EASA are raising the specific performance expectations from the maintainers and maintenance organizations to a higher safety standard.

CONCEPTS

Ethics

Ethics, in overly simplified version, is a code of behavior that encourages human actions in support of a good life. In short, it’s choosing the “right” course of action in situations where one can choose among several courses of options.

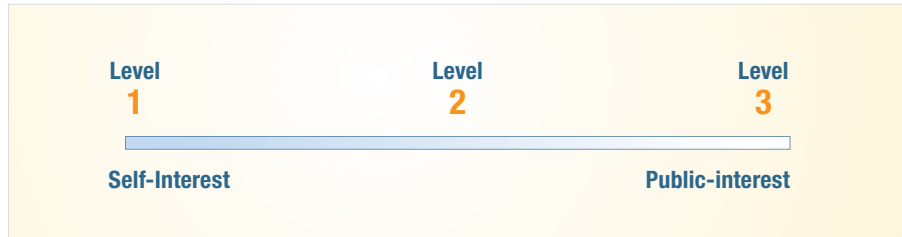
Levels of Decision Makers

When people make decisions in the aviation maintenance environment, they typically have a choice of deciding to do what is ethical or not. In the field of ethics, decision makers are classified as one of three general types, as follows:

Level 1: A person who makes decisions solely on the basis of self interest

Level 2: A person who makes decisions based primarily on social standards

Level 3: A person who makes decisions based primarily on the Principle of Respect



Principles of Ethical Behavior

The following seven key principles of ethical behavior, presented in a prioritized order, are discussed in this chapter:

- 1. The Principle of Respect**—Treat others as you want to be treated.
- 2. The Principle of Non-Malevolence**—Do no harm with your actions.
- 3. The Principle of Benevolence**—Act to promote the well-being of others.
- 4. The Principle of Integrity**—Conduct yourself professionally.
- 5. The Principle of Justice**—Treat people fairly.
- 6. The Principle of Utility**—Choose the actions that promote the greatest good for the greatest number of people.
- 7. The Principle of Double Effect**—Choose actions so the good effects are greater than the bad effects.

Because they focus on the core issue of human dignity, these principles are independent of national, professional, and organizational cultures as well as religious beliefs.

METHODS

This section focuses on application of a moral decision-making process to the aviation maintenance environment.

Like many professional organizations, the Professional Aviation Maintenance Association (PAMA) has published the Code of Ethics for Maintenance Personnel and the Aircraft Engineers International organization has also published a Code of Professionalism. Some of the key elements common to these codes are as follows:

- Maintenance professionals are responsible to the general public.
- Maintenance professionals are expected to maintain currency of knowledge, exercise truth, integrity and honesty in their judgment,

and work within the scope of their expertise.

- As professionals, aircraft maintainers are expected to remain loyal to the general public and refrain from compromising safety for personal gains.
- Maintenance professionals are expected to exercise assertiveness and not allow their superior to pressure him/her to approve aircraft or equipment as airworthy under questionable circumstances.

The detailed Code of Ethics presents a general reminder of the responsibilities associated with the privileges of an aircraft maintenance technician/mechanic/engineer. It reminds the certificate holder that his/her primary obligation is to the flying public more than the employer.

PAMA/SAE Institute Code of Ethics

The Professional Aviation Maintenance Association implores each certified person to exemplify the philosophy and discipline of professional maintenance in every aspect of their life. Every PAMA/SAE Institute certified professional must be intolerant of unethical behavior and act to swiftly eradicate it. In this way, morality and integrity will remain the essence of the certified aviation maintenance professional.

To be in compliance with the PAMA/SAE Institute Code of Ethics, all certified members are to contribute to ensuring the highest levels of airworthiness and ethics. This includes the following responsibilities:

- Safety
- Continuous Education
- Respect
- Non-discrimination
- Honesty
- Orderly Behavior
- Loyalty
- Lawful Conduct
- Fairness
- Proper use of Influence of Position

Failure to Comply may result in Revocation of Certification

This code was originally developed by Jerry Lederer, founder of the Flight Safety Foundation. It is printed with permission from PAMA

Ethics Checklists

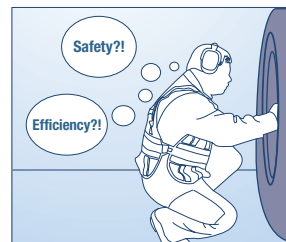
The Federal Aviation Administration has developed the following set of pre- and post-task checklists that are intended to remind the maintenance personnel of their responsibilities.

Pre-Task Checklist
<input type="checkbox"/> Do I have the knowledge to perform the task?
<input type="checkbox"/> Do I have the technical data to perform the task?
<input type="checkbox"/> Have I performed the task previously?
<input type="checkbox"/> Do I have the proper tools and equipment to perform the task?
<input type="checkbox"/> Am I mentally prepared to perform the job task?
<input type="checkbox"/> Am I physically prepared to perform the task?
<input type="checkbox"/> Have I taken the proper safety precautions to perform the task?
<input type="checkbox"/> Have I researched the FARs to ensure compliance?

Post-Task Checklist
<input type="checkbox"/> Did I perform the job task to the best of my abilities?
<input type="checkbox"/> Was the job task performed to be equal to the original?
<input type="checkbox"/> Was the job task performed in accordance with appropriate data?
<input type="checkbox"/> Did I use all the methods, techniques, and practices acceptable to the industry?
<input type="checkbox"/> Did I perform the job task without pressures, stress, and distractions?
<input type="checkbox"/> Did I reinspect my work or have someone inspect my work before return to service?
<input type="checkbox"/> Did I make the proper record of entries for the work performed?
<input type="checkbox"/> Did I perform the operational checks after the work was completed?
<input type="checkbox"/> Am I willing to sign on the bottom line for the work performed?
<input type="checkbox"/> Am I willing to fly in the aircraft once it is approved for the return to service?

AMTs are often placed in situations that tend to challenge them to trade off safety against efficiency. Sometimes, they find themselves faced with maintenance actions for which they are either not trained or don't have the appropriate tools, parts, supplies, or equipment. The following decision-making process is presented to help AMTs as well as managers make consistent ethical decisions that are grounded in the fundamental tenets of moral decision-making.

It is important to emphasize that the priorities of the different groups responsible for the aircraft maintenance process can be (and often are) quite different. For example, managers are evaluated based on their ability to get the work accomplished on time—hence production is a key yardstick of performance. Similarly, maintenance planners are evaluated on their ability to improve the efficiency of the maintenance process. Maintenance technicians/engineers, on the other hand, are evaluated by their ability to return the aircraft to service. Typically, there are no annual performance evaluations for mechanics; once they pass the probationary periods, the rest of the salary increments are typically based on seniority and specific qualifications/certifications.



Moral Decision-Making Framework

In reality, AMTs are often placed in situations that tend to force them to trade off safety against efficiency. Sometimes, they find themselves faced with maintenance tasks for which they are either not trained or don't have the appropriate tooling, parts, supplies, or equipment. The following decision-making process is presented to help maintenance AMTs as well as managers make consistent ethical decisions that are grounded in the fundamental tenets of moral decision-making.

Since ethical behavior implies doing the right thing, it is reasonable to ask how one determines the "right" thing in a particular situation. Answering the following questions can help establish a reasonable moral framework for making maintenance-related decisions:

- **Intent:** What do you intend to do? How does it measure up against the Principle of Respect? Is it morally permissible, impermissible, or obligatory?
- **Motive:** Why do you intend to do it? How does it measure up against the Principle of Respect? Is it morally permissible, impermissible, or obligatory?
- **Circumstances:** What are the circumstances under which you must act? What are the alternative actions or inactions?
- **Decision:** What is your final decision?
- **Action:** What action must you carryout?
- **Outcome:** What is the foreseeable good outcome of your action? What is the foreseeable bad outcome of your action? What is the unforeseeable bad outcome of your action? Is the intended good outcome clearly "worth" the unintended, foreseeable or unforeseeable bad outcome? Are you willing to live with the outcome?
- **Due Diligence:** Have you done everything possible to minimize the foreseeable bad outcome and made every effort to identify all of the bad outcomes?

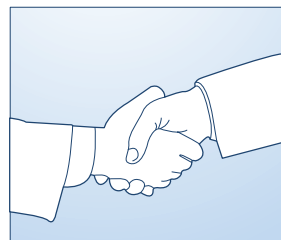
GUIDELINES

This section describes in detail the seven key principles of ethical behavior, the three levels of decision-makers, and uses examples to illustrate how to use the moral decision-making framework described in the previous section. It might be useful to note that these principles can be used in any context—on the job or life in general.

The Seven Key Moral Principles

1. The Principle of Respect:

Treat every person with the respect befitting the dignity and worth of a fellow human being. In other words, treat others as you wish to be treated.



Applying this principle to the maintenance environment, treat co-workers, the flight crew, and the passengers with the same respect and dignity as with which you would want to be treated.

Passengers have paid the fare for their transportation and have an expectation of safe transportation in exchange. Similarly, the flight crew has an expectation of airworthiness, which, by extension, is an assurance of safety. The passengers and the crew are relying on the integrity of the airworthiness system, which in turn is assured by the regulatory oversight process. Therefore, they are expecting that the the maintainers, airlines, and the regulator have done everything possible to assure safe transportation.

The principle of respect is at the intersection of the responsibility and obligation of every party involved in safe transportation by air.

2. The Principle of Non-Malevolence:

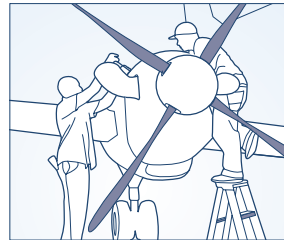
In all your actions, avoid harming people.



In the maintenance environment, don't harm people or property through negligence, either through omission or commission, or by deliberate sabotage. Aircraft maintenance personnel are entrusted with the security and care of expensive equipment and they are given access to restricted areas. These privileges must be respected and not used for personal or political gains.

3. The Principle of Benevolence:

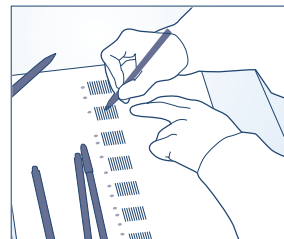
Promote the well being of others.



Aircraft maintainers have the opportunity to help their fellow professionals improve their knowledge and skills as well as to use all available means to improve the maintenance system. If there are any known discrepancies in the system that creates safety hazards, maintainers, as professionals, are expected to address those issues and improve the system.

4. The Principle of Integrity:

Maintain personal standards of conduct befitting a professional. Respect yourself in all of your decisions so as to be worthy of living a fulfilling professional life

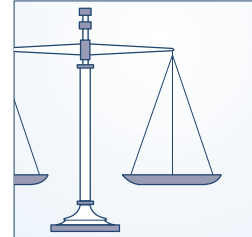


The entire airworthiness system, and by extension, the aviation safety system, is dependent on the professional integrity of all the individuals who participate and interact with the system.

The pilots and the regulators trust the maintainers' signatures on the airworthiness release (and all the intermediate documentation). These signatures are essentially a promise that all maintenance actions have been accomplished in accordance with the appropriate functional regulatory requirements and that the aircraft conforms to the current airworthiness standards.

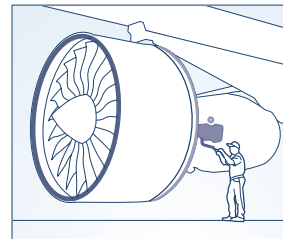
5. The Principle of Justice:

Treat people fairly as human beings. Do not judge them prematurely or unfairly.



In all professional endeavors, people commit errors. Errors are, by definition, unintentional. One must treat everyone fairly and examine the circumstances under which they committed the error. Would another equally qualified person in similar circumstances have committed a similar error? What can be learned from the error that would benefit the system and protect other people from harm? Similarly, from a manager's perspective, one must not place people into situations in which they are coerced to compromise their integrity.

6. The Principle of Utility: Given that one's intentions and goals are morally permissible or obligatory, one must choose the course of action that produces the greatest benefit for the greatest number of people.



One place to apply this principle would be in the context of an error reporting system. When a person files an error report, that person expects fair and respectful treatment.

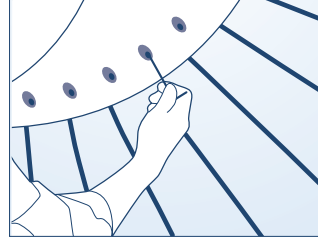
The standards applied to addressing reported errors must distinguish between those committed in the course of conscientious job performance and those that result from gross negligence. For most errors, analyzing and adjusting the conditions that produced the error will minimize recurrences. In extreme cases, the response to an error might include disciplining or even firing those directly involved in the committing the error.

In cases of intentional disregard for safety, a disciplinary action may be warranted. In such cases, the intention is to improve the safety of the aviation system and termination of employment is morally permissible. Arguably, such an action produces greatest benefit to the greatest number of people because it removes the

inadequately prepared individual from the system, instills a sense of justice and fairness among competent hardworking professionals, and enforces performance standards that clearly distinguish between negligence and honest mistakes.

7. The Principle of Double Effect:

The foreseeable good effects of an action should heavily outweigh the foreseeable bad effects of the action.



If the main effect of an action is to ensure airworthiness of the aircraft, and taking a delay is the foreseeable bad side effect, the delay is a morally acceptable bad side-effect. The term “foreseeable” implies that one thinks about the consequences on their actions before they embark upon the actions.

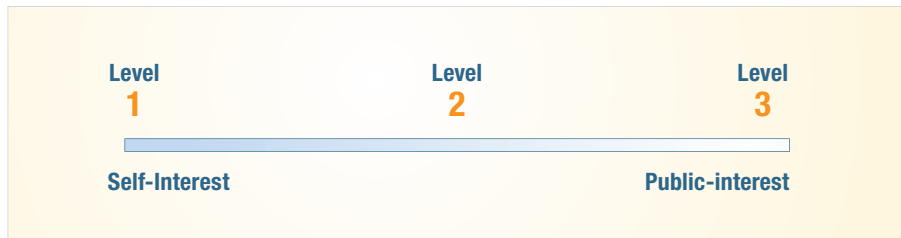
In the extreme (and hypothetical) case where an employee is outraged with the safety violations in the company, has tried all possible internal avenues to correct those safety problems, and is now ready to call the regulator or the media and blow the whistle, the individual should weigh the benefits of the intended good versus the foreseeable bad side-effects. The term “foreseeable” implies that one thinks about the consequences of one’s actions before embarking on them.

In this example, the employee may be successful in getting getting regulator or the media’s attention and thereby addressing the safety violations, but it is also possible that the entire company would shut down and hundreds of people would lose their livelihood. While one person might argue that nobody has the right to make decision that singularly impacts the livelihood of several people, another might argue that nobody has the right to make a living where people can get hurt. The point is that one should weigh the foreseeable bad side-effects and take actions that are consistent with the principle of respect.

Three Levels of Moral Decision-Making

Given a moral dilemma, people's decisions can be classified into three levels, which define the degree to which the decision is based on self-interest or public-interest (not to be confused with popular opinion).

- Level-1 decision-makers choose their actions based on self-interest.
- Level-2 decision-makers choose their actions in accordance with the social norms.
- Level-3 decision-makers choose their actions in accordance with the principle of respect.



For example, a person who decides not to sign-off maintenance actions that have not been performed because he is afraid of getting caught and losing his license/certification, is a Level-1 decision-maker. A person who makes the same decision because he is afraid it would not be acceptable to his peers and he would risk social segregation, is a Level-2 decision-maker. A person who makes the same decision because it would be disrespectful to the passengers and crew who expect him to maintain the highest standards of integrity, is a Level-3 decision-maker.

This classification is based on the rationale that was used to arrive at the decision, rather than the decision itself. Therefore, the training goal should be to raise awareness of the principle of respect and encourage maintainers to make decisions that are consistent with that principle. Organizations such as labor unions and professional societies, as well as individual mentors, can be very effective in helping new AMTs develop such decision-making criteria.

Application of the Moral Decision-Making Framework

The basic moral decision-making framework was presented earlier in the form of intent, motive, circumstances, decision, action, outcomes, and due diligence. Under this framework, one must be able to demonstrate that the foreseeable-unintended-bad effects are not disproportionate to the intended-good effects of an action. Since most decisions have to be made under a certain level of uncertainty, as additional information becomes available and the degree of uncertainty changes, one must re-evaluate the decision and make appropriate changes, if possible. Such ability and willingness to continuously monitor the situation and make changes so as to keep the actions consistent with the ethical principles is due diligence.

In the aviation maintenance environment, most actions are governed by a number of legal requirements. Illegal actions, i.e., those that involve clear violations of a legal requirement, don't require the application of the moral framework. The actions are illegal, after all. For example, it is illegal for a mechanic to sign-off an aircraft that is not in full compliance with airworthiness requirements—regardless of his or her reasons for doing so.

This sounds straightforward. However, mechanics sometimes find themselves in a grey legal area. For example, suppose the available and approved procedures are flawed (and commonly acknowledged to be incorrect or unworkable). Adherence to such procedures may endanger the aircraft's safety. According to regulation, violation of the existing procedures is illegal. In these situations, mechanics tend to accomplish the maintenance task using a "workaround" solution, which they have developed through experience, and sign off the published procedures. Workarounds are almost always done with the full knowledge and implicit consent of management.

Workarounds are fraught with practical, legal, and ethical problems. Analyzing this scenario through the moral decision-making framework will reveal the following;

- **Intent**—The intent is to prevent making a mistake in accomplishing the maintenance task.
- **Motive**—The primary motive is to ensure the airworthiness of the aircraft being maintained.
- **Justification**—The justification for the workaround is that the published procedure is flawed.

Since the intent and motive are morally permissible, the analysis can proceed. The circumstance that prompts a workaround (rather than officially getting the procedures corrected) is that getting the procedures corrected is a time-consuming and mostly ineffective process. Maintenance on the aircraft could be held-up for a long time until the procedures are corrected.

An alternative to simply working around the flawed procedure based on personal judgment is to seek field authorization from the regulator or the aircraft or part manufacturer's engineering group. This would involve another party to objectively examine the task and assist in developing a mutually acceptable solution. Then, the decision could be to go ahead with the field-authorized procedures.

The intended good is completing the maintenance task without committing an error. The unintended foreseeable bad outcome is the failure of the new procedure. The unintended unforeseeable bad outcome is that the new procedures might introduce another error in the system and could potentially increase the risk of failure. Seeking field approval from the regulator or the engineering group provides for the necessary due diligence.

Ethics in Maintenance Management

The aviation maintenance workplace exhibits an interesting ethical contradiction. On the one hand, most maintenance managers rise from the mechanic/engineer

ranks. However, the management-employee relationship is so strained that about one third of the AMTs in the United States don't trust their managers to act in the interest of safety. Why should this situation exist?

After studying a wide variety of aviation maintenance organizations for over 10 years, particularly in the United States, the author is able to make the following observations:

- The field level employees (AMTs/AMEs) are primarily concerned about the airworthiness of the aircraft—their professional licensure/certification demands that they pay attention to the effectiveness of the maintenance process.
- Mid-level managers are primarily concerned about the business success or production success of their organizational unit—their job evaluations demand that they pay attention to the efficiency of the maintenance process.
- Top-level managers are primarily concerned with the reputation of their organization, which is believed to drive business success. Therefore, their success rides on the overall ranking/rating of their organization by their stakeholders and customers.
- In times of fierce business competition or struggle for survival, cash flow tends to be over-emphasized. The thinking seems to be that the quality of maintenance will not be an issue if the company does not survive in the short term. Consequently, the number of compromises to maintenance safety tends to increase as managers take greater risks. They hope that they will be able to make the company last long enough to have the resources to address the maintenance needs in the future. In some cases, the managers know that they will be renewing their fleet and therefore tend to ignore the maintenance needs of the older aircraft.
- Ethical compromises tend to stem from resource challenges. When the resources are plentiful, it is easier to abide by ethical principles. When resources are scarce, one is forced to prioritize one's values and make a choice. Examples of poor choices include the following:
 - the manager who schedules inadequately trained mechanics to work on specific systems
 - the mechanic who chooses to work overtime in spite of exhaustion and deteriorated physical/mental capacity to handle the required tasks

When faced with limited resources, people tend to make risk-based decisions. In some cases, these decisions are grounded in well-established safety risk management framework; more frequently, however, such decisions are based on the individual/personal intuition of the manager.

WHERE TO GET HELP

Online Resources

General Resources in Applied Ethics

- <http://www.ethics.org/>
- <http://www.scu.edu/ethics/>
- <http://www.ethicsweb.ca/resources/>

Aviation/Engineering Applications

- Engineering Ethics: <http://www.onlineethics.org/>
- PAMA's Code of Ethics for Aviation Maintenance Technicians: <http://pama4.timberlakepublishing.com/content.asp?contentid=159>
- Aircraft Engineers International's Code of Professionalism: <http://www.airengi-neers.org/Professionalism>
- Do Engineers Owe Duties to the Public? http://www.raeng.co.uk/news/publications/list/lectures/Engineering_Ethics_Lecture.pdf

Management Applications

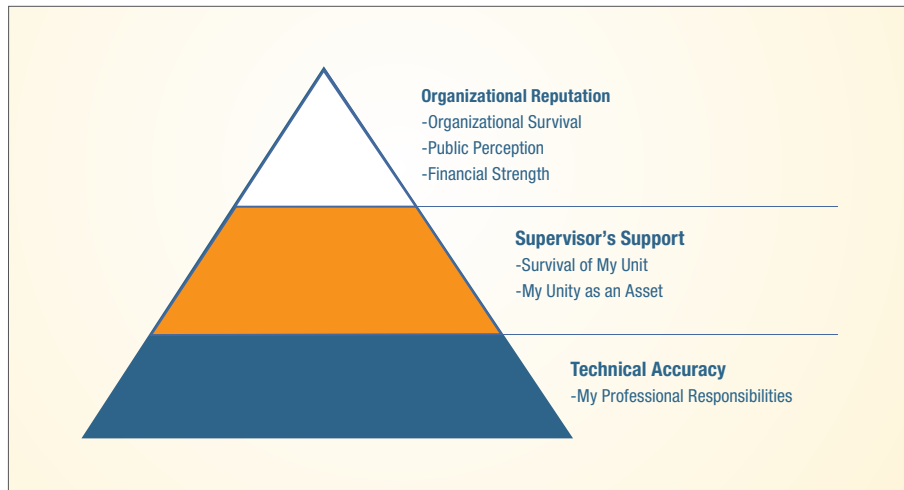
- <http://www.ethicscentre.ca/EN/index.cfm>
- <http://www.web-miner.com/busethics.htm>

Case Studies

- <http://www.vanderbilt.edu/CenterforEthics/cases.html>
- <http://www.engineering.com/Library/ArticlesPage/tabid/85/articleType/ArticleView/articleId/70/BF-Goodrich.aspx>
- <http://www.scu.edu/ethics/dialogue/candc/cases/product-safety.html>

EXAMPLE SCENARIOS

In a typical aviation maintenance organization, there is a pyramid of employees: at the bottom of the pyramid are the frontline employees who are primarily responsible for maintenance of the aircraft; at the middle of the pyramid are the supervisors and managers who are primarily responsible for the “production”—making sure that the maintenance tasks are carried out in the budgeted time and resources; at the top of the pyramid are the top managers who are primarily responsible for the organizational reputation, which includes public perception, financial strength, and overall organizational survival.



Since these three levels of employees have different perspectives and priorities, they often tend to have difficulty communicating amongst them, particularly on safety issues.

Three scenarios are presented below. These scenarios are drawn from interviews and archival document research of factual circumstances; however, they are sufficiently de-identified to protect the identity of the individuals as well as their organizations.

Scenario 1: The Safety Martyr

The Facts

“Bob,” an administrative employee (not a licensed AMT), was responsible for managing the maintenance records and coordinating warranty claims with the Original Equipment Manufacturer (OEM). He discovered that three third-party maintenance providers were using unlicensed AMTs to sign-off work and return the aircraft to service. It is not unusual for third-party maintenance providers or repair stations to employ a much larger unlicensed technical workforce than airlines because they use the repair station authorization to approve the work, not their individual license. Only a select number of individuals are usually authorized to return the aircraft or the component to service under the repair station’s authorization. However, the point is that Bob discovered a technical problem that could have a range of legal and safety consequences.

The Ethical Issue

If unlicensed people were signing off the maintenance work and it was not covered under the repair station’s authorization, it was illegal. As a customer organization, Bob’s airline is still liable for this work and could face fines from the FAA. The airworthiness of the aircraft is questionable if the maintenance work was not performed properly, nor inspected/approved by a licensed AMT. Clearly, Bob had an ethical challenge.

Bob’s intent was to ensure safety was not being compromised; his motive was simply his respect for the flying public. As far as the flying public is concerned, they don’t know or care where the maintenance was performed, as long as it was performed in accordance with the Federal Aviation Regulations. The circumstances were such that an increasing amount of maintenance work was being outsourced as the airline was engaged in aggressive cost-cutting, the labor unions were upset with the management, and it was difficult to clearly determine whether safety was being compromised.

The alternative to speaking up was to say nothing. If Bob did not say or do anything about this situation, the outsourced maintenance would continue and the apparent errors would go unchallenged. If Bob was correct in his assessment, the airline could lose an aircraft and such an accident could certainly accelerate the airline into bankruptcy (there are plenty of such examples in the industry). If Bob was wrong, and it was just a clerical error, the airline would continue to operate as before, but Bob would sleep much better—reassured that the aircraft and the flying public are not in any danger.

The Analysis

Bob had to make a decision: to act or not to act. Bob spent a month collecting data and determining the gravity of the problem. In his research, Bob discovered several documentation discrepancies—it was not conclusive whether these were just documentation issues or they were just symptoms that maintenance was not being accomplished.

Bob contacted his supervisor, but was brushed off. The supervisor told Bob that it was just a clerical issue and it's not his concern—the persons who are responsible for accepting the aircraft from the repair station should be concerned about these issues. Bob was not satisfied with the answer, so he complained to the FAA.

Bob did not fully analyze the potential consequences of his action. He thought he was doing the right thing by going to the FAA. He also thought that the federal Whistleblower Protection Act would protect him from any retaliation by the employer. However, he did not know of any previous incidents where an employee was protected by the Whistleblower Protection Act or how he would go about securing such protection. The undesirable side-effect of his filing a complaint with the FAA was that he could lose his job.

From the perspective of the three levels of decision-makers, Bob was clearly a level-3 decision maker. He wanted to go to the FAA because he thought it was the right thing to do. He was aware of the possible intended and unintended consequences of his decision. He was willing to accept the consequences.

The Consequences

The airline terminated Bob for violating the airline's confidentiality policy. Moreover, the whistleblower protection can be trumped if the company is under bankruptcy protection—Bob did not know this critical fact. Six months after Bob was terminated, the FAA discovered that there were legitimate problems with the maintenance documentation. They fined the airline, but the fine was reduced after negotiations. Eventually, the repair station reimbursed the airline.

The Moral of the Story

In this case, Bob became a safety martyr. He sacrificed his job to seek improvements in safety. It is not clear whether there were legitimate safety issues at stake or not because the evidence only points toward documentation errors.

The key point to take away from this example is don't be in a hurry to be a martyr—do your homework, find appropriate internal channels to improve safety, and collect documentation regarding the effectiveness of the existing channels. Consult an attorney to ensure that you can be protected by the Wendell H. Ford Aviation Investment and Reform Act (<http://www.osha.gov/dep/oia/whistleblower/acts/air21.html>) because the burden of proof rests on the complainer. Then, decide whether or not you are ready to take the next step. In similar cases, people have taken a stand and complained to the company. The company has terminated them for insubordination, but subsequently, the company has taken them back and given them back pay because they could not find sufficient grounds to terminate them.

Scenario 2: Cost-cutting can lead to safety concerns

Reportedly, an airline's three major costs are labor, fuel, and maintenance. For an airline that is battling an impending bankruptcy or other serious financial challenge, the pressures on managers are twofold: first, reduce operating costs and second, improve production. The following is a scenario from a manager's perspective.

The Facts

"John" started with the airline as a mechanic, learned the maintenance tasks and progressed to management. As a mechanic, his priority was airworthiness of the aircraft. As a manager, his priority is on-time performance. His year-end bonus is tied to the performance of his unit—he needs to be effective in releasing his aircraft for revenue flight within the short time available on a gate. If his aircraft is delayed, he doesn't get his annual bonus; his mechanics on the other hand do not receive such a performance bonus. Also, his maintenance budget has been shrinking—he cannot simply assign more people on a job or hold extra parts in inventory because he doesn't have the budget to do so.

One night, an airplane arrived at John's gate and the pilot noted that the right aileron jerked to the right while airborne. The aircraft also had a blown tire. John did not have sufficient mechanics to address both issues.

The Ethical Issue

While the blown tire was obvious and had to be replaced in order for the flight to continue, John did not have the time or the resources to open up the aileron assembly and investigate that problem further. There was a chance that it was just an anomaly and may not happen in the air again. There was also the chance that something more serious was wrong, and because this was a primary flight control surface, he should investigate if further, repair if needed, and test fly the airplane in order to thoroughly assure that the problem has been addressed. However, none of this was possible during the limited turnaround at the gate.

The Analysis

John's intent was to release the aircraft on time; his motivation was rooted in his performance evaluation. The circumstances were that the airline had an aging fleet and it was nearly impossible for John to meet his performance targets if the airplanes kept breaking down on his shift. The airline had announced fleet replacement within the next two years, after it had improved its financial health. The foreseeable, unintended consequence was that the aileron could fail in flight and the airplane would have to declare an emergency; worse, the airplane could have an accident. Another unintended consequence, and perhaps unforeseeable for John, was that if more people were to sign off aircraft as airworthy, when they are not, the management is likely to underestimate the urgency to replace the fleet and decide to postpone its decision.

John had to decide whether or not to release the aircraft. Even if his mechanics refused to sign-off the aircraft, he could. He marked the logbook as "no fault found" and released the aircraft. That way, he was legally protected.

The Consequences

Fortunately for John, the material consequence of his decision was not so severe. The pilots experienced the same problem on the next flight, reported it to the next station. Once on the ground, the flight crew refused to accept the airplane and that station had to open up the aileron assembly and adjust the cables and pulleys to prevent them from jamming. The maintenance supervisor at that station took a hit on his performance.

On the moral side of the consequence, John received a “free” lesson – at least it was free for him. Not so free for the maintenance supervisor at the other station. He now faces another choice: does he continue to take risks or does he learn to not take similar risks in the future.

The Moral of the Story

The key point in this scenario is that material incentives are sometimes tied to the wrong performance metrics: have the courage to hold safety higher than production; earn the respect of your workforce by standing up for them.

Scenario 3: Corporate Integrity Program

This is an example of what is possible when employees and management embrace open communication and hold each other accountable for their actions as well as inactions.

The Facts

One company uses enterprise software that allows all the employees—technical as well as non-technical workforce—to submit any problems, hazards, or systemic issues that need to be addressed. Customer complaints as well as technical challenges are handled through this system. All the communication is logged and is retrievable for analysis.

This company had an event. A mechanic lowered the flight controls on to a work stand and damaged the airplane. As a result of this event, there was an internal investigation. The event, the people involved in the event, the damages caused, and the investigation report were recorded in the enterprise software. Thereafter, a list of corrective action recommendations was generated and each recommendation was assigned to a specific manager. Each such manager received one week to respond. The manager may respond as the task is in progress or may respond as completed, but if there is no response from the manager, his manager is notified. Again, this manager gets one week to act. If he doesn't act, the next higher level manager is notified. Ultimately, the system is setup to notify the CEO.

The Ethical Issue

The most obvious issue in this scenario relates to the transparency of the event investigation and follow-up processes. Because the software is available to everyone in the company there is no easy way to hide reported problems, event-related processes, or people's identities. Such a system could be abused, especially if the company employees do not buy into its intent, implementation and execution.

The Analysis

The goal of using this software is to address all the issues pertaining to real or perceived maintenance problems. Because all records of the transactions and communication are maintained in the centralized system, this is the cleanest way to improve the overall integrity of the organization.

The organizational intent of using such a system, particularly in the instance cited in this example, is to improve its quality, performance, and safety. The motivation is that unresolved problems with quality or safety will affect performance and thereby impact both the employee morale and the financial bottom line. The circumstances are such that the company has the technical resources to build the software, the leadership to insist on the use of such a system, and the employees that have grown to trust the management.

REFERENCES

The Consequences

While the intended consequences of such a system are focused on organizational improvement or learning, the unintended, but positive, consequences are in the areas of employee morale and employee-management trust.

The Moral of the Story

When conceived and implemented correctly, transparent problem resolution systems work well and can become the cornerstone of a company's integrity and reputation.

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