Voluntary Reporting of Safety Information: The Feasibility of Developing Such Programs in the US Railroad Industry and A Proposed Pilot Demonstration Project

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Executive Summary

An investigation of the current status of voluntary incident reporting programs in the US, the United Kindgdom, and Germany was conducted. In addition, disucussions with key railroad labor and management leaders were held to consider the possiblity of developing voluntary reporting programs in the US rail industry. Finally, a sample web-based reporting form and web site was constructed for use in pilot projects. Results of the study suggest that these programs are widely accepted in other industries and countries. In addition, their utility is demonstrated by the fact that there has been a steady increase in voluntary reporting, especially in the aviation industry. Most noteworthy, however, is the additional fact that in the aviation industry, all voluntary reports are followed by corrective actions designed to remedy or prevent potential unsafe situations or practices. While there is interest in undertaking a pilot program among railroad labor, railroad management remains cautious. A demonstration of the utility of the project in the railroad industry is needed.

Background

The importance of information that can be used to determine the factors that influence the occurrence of accidents and incidents can not be understated. Safety managers, operations managers, and workers themselves need to have accurate information in order to be able to address the types of decisions that can be made to improve safety.

Historically, the kind of information that has been available to persons in the safety industry has consisted of numbers of accidents, the location of their occurrence, and whether those accidents are the result of an object striking the individual or the various body parts that have been injured. Such information has been useful in developing a number of various intervention programs that have led to awareness and reduction of incidents. The NTSHA recall of Firestone tires used on Ford Explorers is a perfect example of the use of this type of statistical information.

Additionally, another form of information can be obtained from accident reports. These are reports compiled by experts who have interviewed accident participants, and various other experts associated with a particular incident. The results of these types of investigative reports have led to recommendations that have been used to address safety concerns.

As can be seen, the key ingredient to being able to improve safety in the industry is information as to the factors, or the root causes, of accidents. It is this type of information that is very useful in developing interventions, changing operational procedures, identifying unsafe or hazardous circumstances and improving training of individuals involved in safe work activities.

Figure 1. Reportable Accidents and Casualties.

The rationale underlying the need for additional reporting of information comes from the theoretical model espoused by Heinrich (1931) and publicized widely by safety experts. This hierarchical model argues that for every accident there are any number of underlying events and activities which lead to and presage more calamitous and potentially fatal events. The original work by Heinrich examined the frequency of fatalities and injuries in a large organization. The resulting analysis demonstrated that there is a direct

proportional relationship between the number of fatalities, major accidents, and minor accidents. These figures relate to a group of 330 similar accidents and demonstrate the degree of variation involved with one type of hazard. They should not be considered definitive. Other authors, such as Heinrich, Petersen and Roos (1980) and Hoyos and Zimolong (1988), quote different ratios. Nevertheless, the notion of a proportional relationship appears to have support.

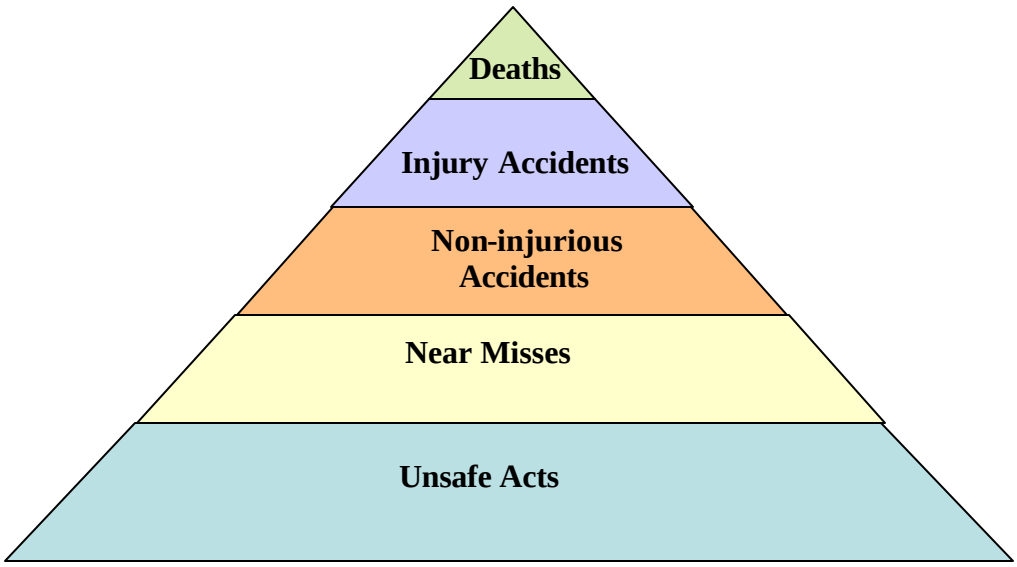

Figure 2. Reportable Accidents and Casualties.

Assuming the underlying pryamidal structure of the relationship between behavior in the workplace and accidents, injuries, and fatalities has prompted an effort to pursue information that will lead to productive and preventative efforts. Critics of the current accident reporting systems argue that simply counting the number of injuries provides only limited, after the fact, information, and additionally provides only clues as to what is going on in the workplace that might lead to accidents and injuries. A more proactive approach would be to obtain "upstream" information regarding the types of work activities, and unsafe acts, that might eventually lead to the occurrence of accidents and injuries in the workplace.

The logical extension of the need to obtain upstream information then, is to have people in the field report the information on a voluntary basis to decision makers who can collect, analyze, and take corrective acction, based on the information. Ideally, any type of information that might lead to corrective action relevant to safety, unsafe acts, or conditions would be useful (see figure 2). On a practical basis, the reporting of "near miss" incidents or acitivity would be extremely useful to persons making decisions about where to take corrective actions.

A variety of corrective actions could be taken on the basis of information gathered. As will be seen from the following survey of existing industry efforts, corrective actions are developed based on the risk of harm or injury that may occur. Typically, high risk activities or circumstances are addressed immediately, whil low risk activities are addressed with different types of interventions, such as training.

Presently, the railroad industry operates on somewhat limited information. Accident statistics are collected, operations testing is performed, and in some cases peer observation of procedures has taken place. Unfortunately, not all information is made available to accident investigators, directors of safety, and decision makers. In many organizations and governmental bodies regulatory officials are charged with administering punitive consequences for so-called accidents and rules violations. Thus, there are many instances in which individuals who are involved in situations that might be likely to lead to injuries, incidents, etcetera are unwilling to provide information that might later be helpful to accident investigators. These strong incentives, to not report or disclose information that might implicate them or possibly lead to a removal from employment, prevent individuals from coming forth with potentially useful information.

In light of this reality, nearly 30 years ago (1975) the aviation industry began a program of voluntary reporting of accident and incident information. This voluntary reporting program was instituted with the help of various outside resources and was termed the Accident Safety Reporting System (ASRS). This program is described in more detail below.

The success of the voluntary reporting systems in aviation has been seen as an indication that there is a need for similar voluntary reporting systems in all modes of transportation. Accordingly, there was an effort by the DOT and the FAA to expand the system to include a wider range of accident reporting systems. By developing Aviation Safety Action Programs (ASAP) the FAA has been attempting to develop a "non-punitive collaborative approach" with the industry, labor, and regulatory bodies in order to increase the likelihood of obtaining information from the field to lead to more effective safety management and planning, and ultimately to the prevention of a greater number of accidents and incidents. This approach is seen as a successful and effective means of improving safety in the transportation industry (Ganter, Dean, Cloer, 2000).

Such a program might be useful in the railroad industry as current statistics suggest that the railroad accident rate has leveled off over the past five years. In other words, it appears that the railroad industry has, in essence, plateaued in its current level of accident performance. These gains have been achieved using traditional methods of safety management. As can be seen from the accompanying graph, there is a plateau that has been reached since 1998. Nevertheless, it appears that there are still a considerable number of accidents and injuries that need to be addressed. These statistics indicate that somewhere between 2 and 4 accidents, per 100,000 working hours, occur each year in the railroad industry. While this may seem small, it is still a noticeable and concerning number. Many in the industry agree that zero accidents are the goal and that even one accident is unacceptable.

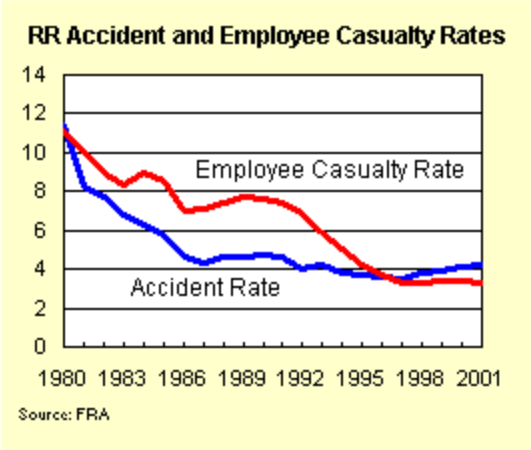

Figure 3. Reportable Accidents and Casualties.

Although great advances in rail safety have occurred over the last twenty years, there is still considerable room for improvement. The purpose of this study is to examine the state of voluntary reporting systems in the airline industry with an eye to the feasibility of developing a similar system in the rail industry.

Several questions are of interest:

1. What is the current state of voluntary reporting in the airline industry?
2. What were some of the experiences of the airline industry in developing these volutary reporting systems?
3. What are the issues in developing a similar system for the rail industry?

Methodology

In order to address the questions outlined above, the investigators engaged in several different activities, including an extensive literature review, interviews with key informants in the aviation industry, beta-testing of web site database reporting, and interviews with selected key informants from the rail industry.

Question #1 -- the Aviation Industry

ASRS/NASA Program

The Airline industry is currently involved in what is called the ASRS – the Aviation Safety Reporting System. The ASRS system began in 1975 and was developed following the crash of TWA flight 514, a B-727 aircraft, into Dulles International Airport killing all 92 passengers on board. A review of the incident by the NTSB discovered that a similar, although non-fatal incident, had occurred six weeks earlier in

October of 1974. Apparently, fears that reporting this incident to the authorities, and notifying other carriers, would lead to punitive action led to the failure to report the incident. Shortly thereafter, the FAA implemented the ASRP system and then in 1976 the ASRS system was implemented with NASA, which was designated the overseer of the database responsible for distributing information and notifying the public.

The program was undertaken with the issuance of FAA Advisory Circular AC 00-46 D. This document specified the type of information which was to be reported to NASA and the qualifications and protections individuals reporting were to have. The Advidsory Circular also pointed out the types of protections and penalties that were to occur.

The ASRS system is one which involves a number of different air carriers throughout the US system. The purpose of this system, as described in its public materials on its web site (see Note 1), is to "collect, analyze, and respond to voluntarily submitted aviation safety reports in order to lessen the likelihood of aviation accidents". The data that is collected is then used to 1) identify the deficiencies and discrepancies in the National Aviation System so that these can be remedied by appropriate authorities; 2) to support policy formulation and planning, and improvements to the NAS (the National Aviation System); and 3) to strengthen the foundation of aviation human factors safety research. This is considered important as over 2/3 of all aviation accidents and incidents are thought to have their roots in human performance errors.

Following discussion with industry representatives and pilots, the FAA determined that pilots were "uneasy" and "reluctant" to report errors to a regulatory agency that could revoke licenses. Consequently, to encourage reporting, the FAA offered individuals who participated in the program "immunity from certain types of enforcement action". In addition, an independent agency, without regulatory powers, was selected as the agency that would manage and analyze reports. NASA was selected as the independent agency. The ASRS program is run through NASA by an independent contractor, the Battelle Memorial Institute.

Confidentiality

One of the key features of the ASRS program is the issue of confidentiality. As noted above, the potential participants in the system were uneasy with the possibility that they might be punished as a result of voluntarily reporting potential incidents. Reports can be made by pilots, air traffic controllers, flight attendants, mechanics, ground personnel, and others involved in aviation operations and all submissions are voluntary. To date, more than 300,000 reports have been submitted and no reported breach of confidence has occurred. Currently, the system averages over 727 reports per week and over 3152 reports per month (Source: ASRS web site).

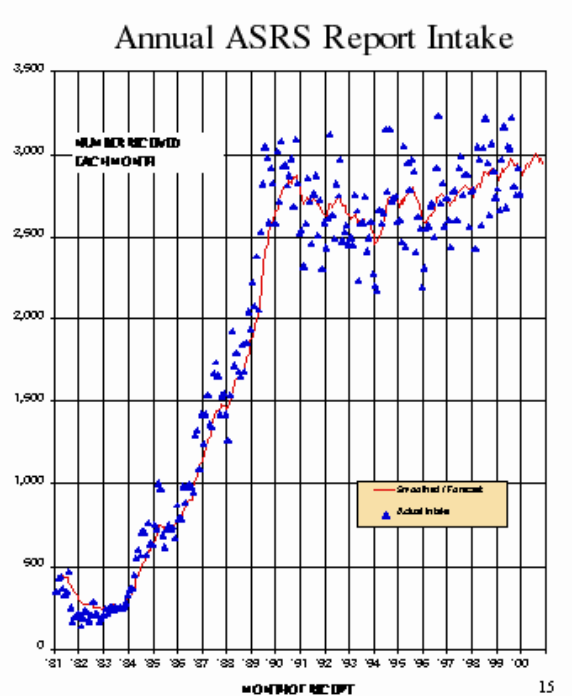

Figure 4. ASRS Report Frequency

The voluntary reports are stripped of all identifying information before the contents are released. Information which is thought to be useful to understanding the event, such as dates, times, locations, weather conditions, etcetera are generalized or eliminated.

Immunity

Many have questioned what would lead people to report an incident when there may be some evidence of a violation of a safety procedure or rule. One of the answers to this question is that this system was designed with offers of immunity to voluntary reporters. In other words, the FAA has chosen to waive penalties and fines, subject to certain limitations, for *unintentional* violations of federal aviation statutes and regulations.

Initially, the program was characterized and criticized as a "get out of jail free" card. However, there are several key provisions which prevent the program from being characterized in this way. Most importantly, the ASRS confidentiality provision does not extend to situations involving accidents or criminal activity (e.g., bomb threats and drug trafficking). There are several limitations to the program that are directly and specifically addressed in Advisory Circular 00-46D, FAR91.25, and paragraph 2-38 in the "Facility Operations and Administration Handbook" (7210.3m), namely:

> The filing of a report with NASA concerning an incident or occurrence involving a violation of 49 U.S.C. Subtitle VII, or the FAR is considered by FAA to be indicative of a constructive attitude. Such an attitude will tend to prevent future violations. Accordingly, although a tiding of violation may be made, neither a civil penalty nor certificate suspension will be imposed if:

- the violation was inadvertent and not deliberate;
- the violation did not involve a criminal offense and accident, or action;
- the person has not been found in any prior FAA enforcement action for a period of 5 years prior to the date of occurrence; and
- the person proves that, within 10 days after the violation, he or she completed and delivered or mailed a written report of the incident or occurrence to NASA under ASRS

When these conditions are met, the individual making a voluntary report is not to be punished or disciplined. These provisions are spelled out in another section of the Advisory Circular 00-46D:

> 5. PROHIBITION AGAINST THE USE OF REPORT S FOR ENFORCEMENT PURPOSES.
>
> Section 9 1.25 of the Federal Aviation Regulations (FAR) (14 CFR 9 1.25) prohibits the use of any reports submitted to NASA under the ASRS (or information derived there from) in any disciplinary action, except information concerning criminal offenses or accidents which are covered under paragraphs 7a(1) and 7a(2).
>
> When violation of the FAR comes to the attention of the FAA from a source other than a report filed with NASA under the ASRS, appropriate action will be taken. See paragraph 9.
>
> The NASA ASRS security system is designed and operated by NASA to ensure confidentiality and anonymity of the reporter and all other parties involved in a reported occurrence or incident. The FAA will not seek, and NASA will not release or make available to the FAA, any report filed with NASA under the ASRS or any other information that might reveal the identity of any party involved in an occurrence or incident reported under the ASRS. There has been no breach of confidentiality in more than 20 years of the ASRS under NASA management.

Thus, there are firm safeguards against the misuse of the database reports to harm the individuals in question. These provisions then appear to ensure that those making voluntary reports will not be harmed.

Reporting Procedures

Presently, the reporting procedures consist of submitting a written report to NASA. Required reporting forms can be downloaded from the web site and separate forms exist for pilots, mechanics, cabin crew, and air traffic controllers. At this time there is no electronic submission. An announcement on the web site indicates that:

> Electronic mail communication is not secure, thus ASRS cannot accept incident reports by e-mail. To report an incident or situation to ASRS, download the appropriate Reporting Form from this page, print, fill out and mail the completed form.
>
> The NASA/ASRS Reporting Forms (General, ATC Controller, Maintenance, and Cabin Crew) are normally printed by NASA on double-sided, legal-size (8 1/2 x 14) paper, but many users cannot easily print two-sided, legal-size pages. NASA/ASRS electronic forms are provided here as

> Adobe Acrobat single-sided, letter-size (8 1/2 x 11) forms, thus you will have to print two pages for the form. An extra page has been added to permit additional narrative, if desired.
>
> Fill out the form on your computer, print the completed form, attach all pages together, enclose in an envelope, seal, affix sufficient postage, and mail to ASRS at the address below, or
>
> Print the uncompleted form, fill it out by hand, attach all pages together, enclose in an envelope, seal, affix sufficient postage, and mail to ASRS.
>
> Electronic report submission is not yet available.
>
> Mail your completed form to: NASA AVIATION SAFETY REPORTING SYSTEM, P..O BOX 189, MOFFETTFIELD, CALIFORNIA 94035-0189

As previosly indicated, ASRS receives reports from pilots, air traffic controllers, air carrier inspectors, cabin attendants, mechanics, and a variety of other individuals. ASRS's report intake has been robust from the first days of the program, averaging approximately 400 reports per month. As previously stated the system averages over 727 reports per week and over 3152 reports per month. In fact, according to the ASRS web site, more than 300,000 reports have been submitted to date (Source: ASRS web site).

Each Aviation Safety Report has a tear-off portion which contains the information that identifies the person submitting the report. This tear-off portion is removed by NASA, time-stamped, and returned to the person making the report as a receipt. This provides the reporter with proof that he or she filed a report on a specific incident or occurrence. The identification strip section of the ASRS report form provides NASA program personnel with the means by which the reporter can be contacted, in case additional information is needed to understand more completely the report's content. Except in the case of reports describing accidents or criminal activities, no copy of an ASRS form's identification strip is created or retained for ASRS files. Prompt return of ASRS program's report, de-identification process, and identification strip ensures the reporter's anonymity.

The ASRS system is open to many different types of crafts and employee groups. Slightly different reporting procedures are available to different groups. At this time there are several different types of reports that may be submitted depending upon the type of occupational grouping. For example,

- Pilots, dispatchers, and airport personnel
- Air traffic controllers
- Mechanics
- Cabin Crew

Different reporting forms are published and available for each grouping. These differences in forms reflect the fact that the different employee groups have different duties and responsibilities.

Analysis of Reports

After reports are received and sanitized of identifying information they are reviewed by at least two safety analysts. The analyst staff is composed entirely of experienced pilots and air traffic controllers and these individuals analyze each report to identify any aviation hazards which are apparent. The reports are screened in terms of the issues that may require immediate attention. In some cases immediate warnings are issued to the aviation industry.

There have been a number of reports prepared and these are listed on the ASRS web site. The reports range from crew fatigue, to altitude deviations, to wake turbulence encounters.

Table 1. ASRS Database Report Sets

Automated Weather Systems	Mechanic Reports
Cabin Attendant Reports	Multi-Engine Turbojet Aircraft Upsets Incidents
Checklist Incidents	Non-Tower Airport Incidents
Commuter and Corp. Flight Crew Fatigue Reports	Parachutist / Aircraft Conflicts
Commuter and GA Icing Incidents	Passenger Electronic Devices
Controlled Flight Toward Terrain	Pilot / Controller Communications
CRM Issues	Rotary Wing Aircraft Flight Crew Reports
Fuel Management Issues	Runway Incursions
Inflight Weather Encounters	TCAS II Incidents
Land and Hold Short Operations	Wake Turbulence Encounters

Information in the database is delivered to the aviation community in a number of ways. The various outlets for information are described below based on information taken from the ASRS web site.

Note that the Crew Fatigue reports are highlighted. Flight crew reports of various operational near misses are made and factors contributing to the event are cited in the report. The ASRS staff then collects reports that have similar causative factors and publishes them in a data base report. One example of a flight crew report is reproduced below in Figure 5. Additional samples are included in the appendix.

Narrative :
WE WERE GIVEN AN INITIAL ALT AFTER TKOF OF 3000 FT MSL. AFTER TKOF FROM RWY 10, THE TWR CALLED TFC ENTERING A R DOWNWIND FOR RWY 10 WHICH WE CALLED IN SIGHT. WE WERE INSTRUCTED TO MAINTAIN VISUAL SEPARATION AND TURN R 250 DEGS. THE CAPT AND I DECIDED THE BEST METHOD OF SEPARATION WAS TO CLB AS QUICKLY AS POSSIBLE SINCE THE OTHER TFC WAS DSNDING INTO THE DOWNWIND. I WAS HAND FLYING THE ACFT AND WAS CLBING THE ACFT PRIMARILY ON VISUAL REFS TO MAINTAIN CONTACT WITH TFC. THE CAPT WAS PREOCCUPIED PERFORMING THE CLB CHKLIST WHEN I REALIZED WE WERE AT 3400 FT MSL. AS I PITCHED OVER TO GET BACK DOWN TO 3000 FT MSL, WE WERE GIVEN A CLB TO 6000 FT MSL. ATC MADE NO REF TO OUR ALT EXCURSION. I BELIEVE MY INATTN TO OUR ALT WAS CAUSED PRIMARILY BY MY FATIGUE THIS WAS THE THIRD DAY OF A 4-DAY TRIP AND THE FIFTH LEG OF 6 LEGS THAT DAY. THE PREVIOUS NIGHT I HAD SLEPT JUST UNDER 8 HRS AND THE NIGHT PRIOR TO THAT ONLY 6 HRS DUE TO SHORT OVERNIGHTS. THE DAY BEFORE THE INCIDENT I WAS ON DUTY 14 HRS AND THE DAY OF THE INCIDENT I HAD ALREADY BEEN ON DUTY 10 HRS. THE FAA SHOULD REWRITE THE REST RULES IN A WAY THAT PREVENTS FATIGUE FROM ACCUMULATING OVER THE DURATION IF MULTI-DAY TRIPS.

Synopsis :
AN AT72 CREW, DURING CLBOUT OF ST THOMAS (TIST), OVERSHOT THEIR ASSIGNED ALT.

Figure 5. Sample flight crew report from the ASRS database.

Callback -- CALLBACK is distributed to more than 85,000 pilots, air traffic controllers, and others. Each issue of CALLBACK includes exerpts from ASRS incident reports with supporting commentaries. In addition, CALLBACK may contain summaries of ASRS research studies and related aviation safety information.

Directline -- ASRS DIRECTLINE is published periodically to meet the needs of operators and flight crews of complex aircraft, such as commercial carriers and corporate fleets. Articles contained in DIRECTLINE are based on ASRS reports that have been identified as significant by ASRS analysts. Distribution is directed to operational managers, safety officers, training organizers, and publications departments.

Operational Issues Bulletins -- ASRS Operational Issues Bulletin's are topical examinations of items analysts see as timely and important in recent report submissions.

Aviation Safety Action Program (ASAP)

Following criticisms and comments that identified the need for an increased focus on safety, additional efforts have been undertaken to address industry needs. Highly skilled professionals can and do make mistakes, thus, the assumption of negligence is not always accurate (Griffith & Marx, 1999). Researchers who have studied “high reliability organizations” such as aircraft carriers (Rochlin, La Porte and Roberts, 1987) found that there is a need to “reward the discovery and reporting of error” even if it is “one’s own error”. The rationale being that it is better to identify and understand error in the workplace than to cover it up as it is not possible to rectify or correct errors, or procedures and circumstances that lead to errors, if they are not known.

The ASRS system was designed as a national and industry wide information dissemination system. The data collected from over 300,000 reports that have been submitted to ASRS has been useful in providing guidance on a national level in improving operating practices and ultimately safety. However, labor and management, in

cooperation with FAA, noted that while the information from ASRS was useful and informative, that a more timely method of getting the information into the hands of corporate decision makers could increase the effectiveness of the program even more. Thus, it was thought that providing ASRS information to corporate training centers, flight safety managers, and others in charge of operations would shorten implementation timelines and have an immediate impact on safety.

Building upon these ideas the FAA has recently developed a new concept and program that extends the principles of the ASRS program to local carriers. This program, called the Aviation Safety Action Program or ASAP is designed to increase accessibility to safety information about various events at the level of the carrier. This program builds on the success of the ASRS program by encouraging confidential voluntary reporting of incidents and events. However, with ASAP, the FAA, the carrier, and labor are directly involved in the program from the outset.

It should be noted that there is no direct reporting relationship between the ASAP programs and the ASRS. However, one carrier indicated that all of the events reported to ASAPs are also reported to ASRS.

The first ASAP was initiated in 1994 by American Airlines at the urging of Captain Scott Griffith with the cooperation of management and the FAA. The current FAA ASAP program is modeled after the American Airlines experience.

This program is independent of the ASRS, instead it is authorized and directed by Dr. Tom Longridge of the FAA. The objective of ASAP is to enhance aviation safety through the prevention of accidents and incidents. The program's focus is to encourage voluntary reporting of safety issues and events that come to the attention of employees of certain certificate holders, or air carriers. To encourage an employee to voluntarily report safety issues, even though they may involve an alleged violation of Title 14 of the Code of Federal Regulations (14 CFR), enforcement-related incentives have been designed into the program. An ASAP is based on a safety partnership that includes the Federal Aviation Administration (FAA) and the certificate holder or carrier, and may include any third party such as the employee's labor organization.

FAA Advisory Circular (AC) AC 120-66B describes and details the components of the Aviation Safety Action Program. This process chart, shown on the ASAP web site diagrams the ASAP policy found in the AC. As can be seen, the program begins with a memorandum of understanding between the carrier, or certificate holder, the FAA, and a labor organization. The MOU outlines the duties, roles, and responsibilities of each of the parties involved. The MOU essentially creates a contract between the parties that enables the individuals to report incidents confidentially and to be immune from disciplinary action.

The flowchart on the following page outlines, in detail, the steps and procedures that the ASAP process follows. As can be seen, the process identifies a committee called the ERC or Event Review Committee. The purpose of the ERC is to review the reports

submitted to determine whether they meet the criteria as outlined in the ASAP program and MOU (Memorandum of Understanding) signed with the FAA. If the submitted report does not meet the criteria for: 1) non criminal activity; 2) timeliness of reporting; 3) non intentional disregard for safety; and 4) sole source reporting, then the ERT does not permit the report to enter the ASAP system. If the report does meet the criteria then the ERC may develop a response. Lack of sufficient evidence of sole source reporting can lead to FAA administrative action.

It should be noted that the goal of the ASAP program is to promote corrective action taken in response to the events reported. Corrective action is undertaken at the direction of the members of the ERC. Both FAA and carrier management emphasize corrective action, rather than punishment.

Corrective Action

The purpose of the MOU and the ERC in the ASAP program is to develop corrective action. These actions are defined in the MOU as follows (note ESA is the name of a fictitious organization for the purposes of the sample MOU).

> The primary purpose of the (ESA – Fictitious Carrier Name) Aviation Safety Action Program (ASAP) is to identify safety events, and to implement corrective measures that reduce the opportunity for safety to be compromised. In order to facilitate flight safety analysis and corrective action, **Carrier and the labor organizaton join** the FAA in voluntarily implementing this ASAP for **labor organization**, which is intended to improve flight safety through self-reporting, cooperative follow-up, and appropriate corrective action (FAA MOU, Sec 5).
>
> Failure of any party to follow the terms of the program ordinarily will result in termination of the program. Failure of ESA to follow through with corrective action acceptable to the FAA to resolve any safety deficiencies ordinarily will result in termination of the program (FAA MOU, Section 5).
>
> The ERC should also make recommendations to **ESA** for corrective action for systemic issues. For example, such corrective action might include changes to **ESA** flight operations procedures, aircraft maintenance procedures, or modifications to the training curriculum for **pilots**. Any recommended changes that affect **ESA** will be forwarded through the ASAP manager to the appropriate department head for consideration and comment, and, if appropriate, implementation. The FAA will work with **ESA** to develop appropriate corrective action for systemic issues (FAA MOU, Sec 10).
>
> The ASAP manager will publish a synopsis of the reports received in the ASAP section of the **monthly** publication ***of carrier newsletter*** (FAA MOU, Sec 12).
>
> The details of the ASAP will be made available to all **pilots** and their supervisors by publication in the **ESA *Executive Operations Manual*** (FAA MOU, Sec 13).

These statements, taken from the sample MOU provided by the FAA on its website, spell out the types of responses and corrective actions that should be taken when the ERC meets to review reports. It is clear that the general thrust of these reports is to address the need for corrective action that can be taken as a result of the information that is gathered in the reports. It is also clear that should the signatories to the MOU fail to meet the terms of their agreements, the FAA will nullify the MOU and return to the standard investigative and regulatory stance typically taken with the industry.

Event Review Committee (ERC)

The ERC is the key component of this safety process. The principal investigator for this project attended an ERC meeting for a major US carrier. During the meeting several reports were examined and various actions were taken. The committee was comprised of members from carrier management, labor representatives, and an FAA representative. Additional staff was available for support purposes. In order to observe the meeting process the principal author was required to sign a confidentiality agreement.

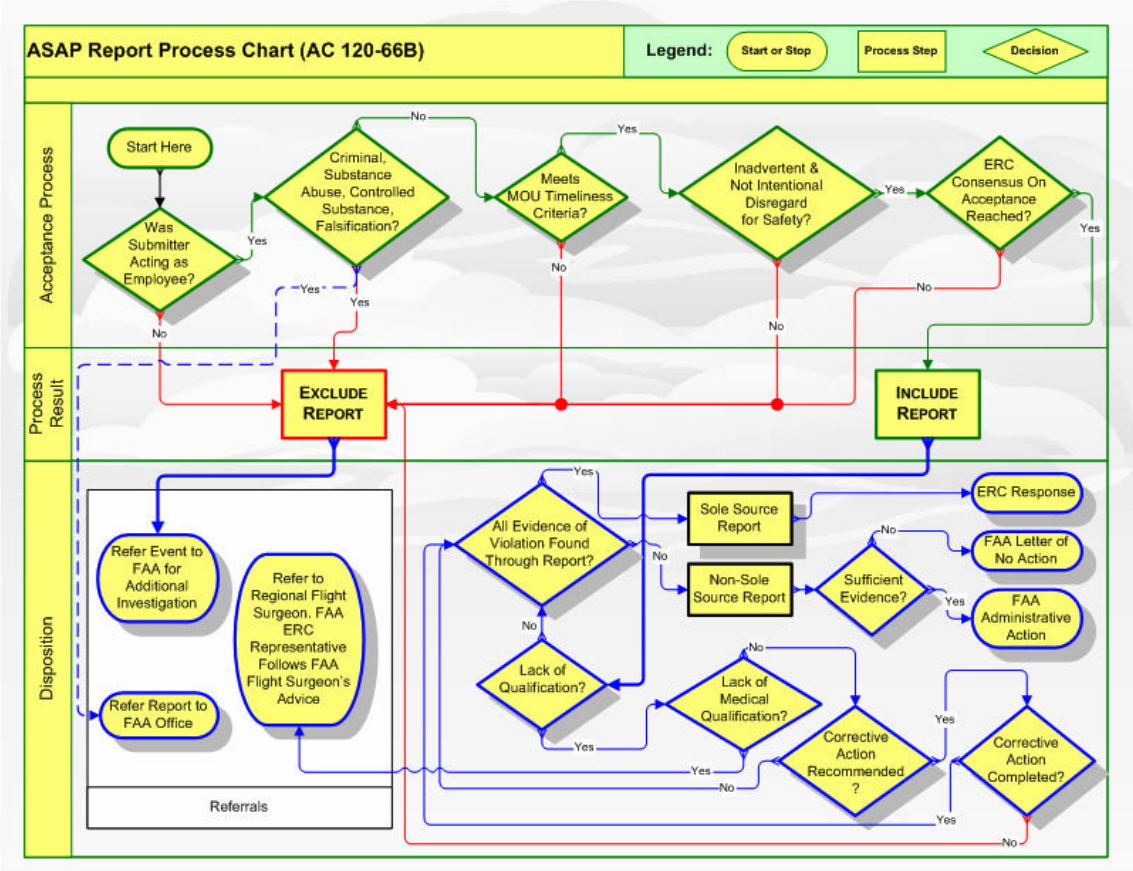

Figure 6. Flowchart of ASAP process.

Consensus in the ERC

An important aspect of the ERC (Event Review Committee) is the fact that "unanimous consensus" must be achieved, meaning, that all members must agree on the course of action. The MOU (see appendix) that has been signed by all parties clearly indicates what is meant by consensus:

> It [consensus] does not require that all members believe that a particular decision or recommendation is the most desirable solution, but that the result falls within each member's range of acceptable solutions for that event in the best interest of safety. In order for this concept to work effectively, each ERC representative shall be empowered to make decisions within the context of the ERC discussions on a given report. The ERC representatives will strive to reach consensus on whether a reported event is covered under the program, how that event should be addressed, and the corrective action or any enforcement action that should be taken as a result of the report (taken from FAA Sample MOU, Section 10, paragraph B).

A recent article examining the operation of an ERC found that ASAP teams (or ERCs) were composed of a carrier, pilot union, and a member of FAA regulatory personnel. The teams were required to reach consensus on the event being reported and the "corrective actions" to be taken. The report concluded that based on trust and communication the participants were a "highly effective cultural mechanism for identifying novel and subtle hazards, and designing rapid, mutually acceptable corrective actions" (Ganter , Dean, Cloer , 2000).

Industry and Labor Satisfaction with ASAP

Discussions with American Airlines and United Airlines (management and labor) revealed that there is a great deal of satisfaction with these programs. They appear to be working well and are widely accepted in the Flight Safety areas. Personal reports from industry representatives indicate that they have received over 6000 reports since the program was initiated in the year 2000. They receive about 50 reports per week and estimate that approximately 31 errors are made each day. For the year 2002 the reports have been classified into five major groupings. These are shown in Figure 7.

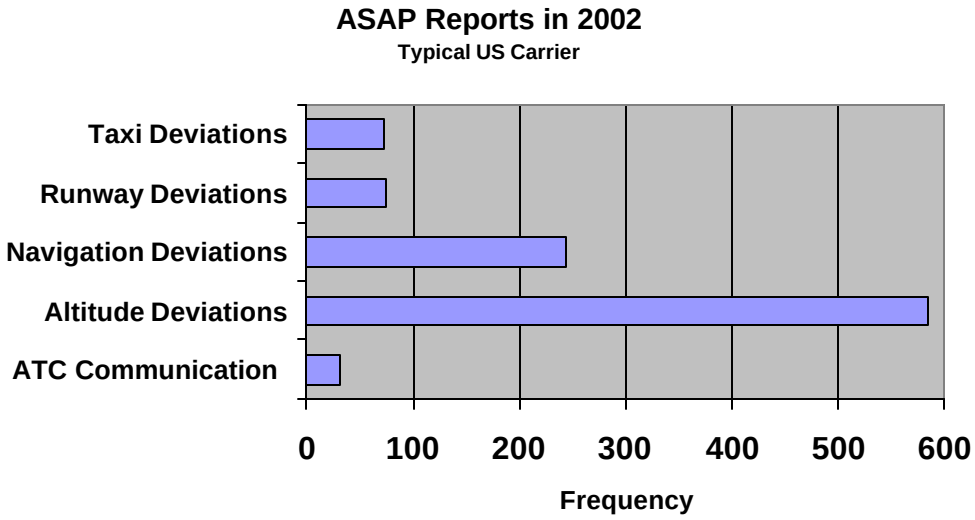

Figure 7. ASAP Reports for typical US Carrier.

Airline carrier management considers these reports to be an under-representation or an under-reporting of the actual number of events. In fact, they estimate that about twice as many of these events occur than are reported. Nevertheless, the program does appear to have been greeted with considerable acceptance and is generally considered a success.

In fact, the program has met with sufficient success as to have been adopted by over thirty other carriers throughout the country. The majority of these programs involve carriers and their pilots (See Table 2). However, several programs have been formed which are involved with maintenance crafts and dispatchers. This represents a significant change in the approach and suggests that the culture of voluntary reporting of safety concerns has begun to expand beyond the ranks of pilots.

Industry leaders have hailed the ASAP program as a critical component of efforts to reduce costs in the airline industry. According to Mac Armstrong of the ATA "ASAP is the right policy – full access to information about what is going on in the workplace -- a non-retribution policy". The importance of this type of policy is considered by industry leaders as very important to the future of the airline industry. In order to continue to drive down costs and to improve the productivity of the airline industry "safety information sharing must continue" and the "airline industry must have SAFETY as the priority – it is a given". In general, this type of reporting is thought to provide a much more accurate view of safety within the operation of the airlines. Accordingly, programs like ASAP will increase the effectiveness of all of the other programs – including crew resource management (Armstrong, 2002).

ASAP Programs Accepted by the FAA

There are a number of ASAP programs that have signed the memorandum of understanding with the FAA. Meaning, the carriers have agreed to the terms of the MOU and have accepted protocols in place to deal with the ERT.

Table 2. Aviation Safety Action Programs (ASAP) Accepted by the FAA

Air Carrier	CMO	Pilot	Maintenance	Dispatcher
ABX Air Inc.	DTW	X		
AirTran Airways, Inc	ATL	X		
Alaska	SEA	X		
Allegheny	MDT	X	X	
American	DFW	X	X	X
American Eagle	DFW	X		
Atlantic Coast	IAD	X		
Comair	CMH	X		
Continental	HOU	X		
Continental Express	COA	X		
Continental Micronesia	HNL	X		
DHL Airways	CVG	X		
Gulfstream Intl.	FLL	X		
Hawaiian Airlines	HNL	X		
Jet Blue	NYC	X	X	
Midwest Express	ORD	X		X
Northwest	MSP	X		
Piedmont	BAL	X	X	
Polar Air Cargo	LAX	X		
PSA Airlines, Inc.	CVG	X		
Southwest	DFW	X	X	
Spirit	DTW	X		
TWA LLC	DFW	X		
United	SFO & DEN	X		X
US Airways	PIT	X		X

As can be seen from the table, most of the programs involve the pilots in the existing programs. However, several have developed and included the other crafts in their programs.

Voluntary Reporting in Non-US Airlines

Lufthansa Airlines

Lufthansa Airlines utilizes three different reporting procedures to accommodate their workforce. Briefly, FLySIS (Flight Safety Information System) is the reporting procedure used by captains and first officers to report all flight safety relevant information. The FLIRES reporting procedure is based on Lufthansa developed software and may be used by all individuals working with or around aircrafts (e.g., pilots, flight attendants, mechanics, and other ground crew). It is with the FLIRES system that all information relevant to the airline is collected, such as hours of service and other related topics. Finally, COSMIC is the reporting procedure used only by flight attendants and pursers to report service relevant information. It has been acknowledged by Lufthansa representatives that the three reporting systems would be more useful if they were condensed into one system. However, these individuals indicated that as a result of the political climate, it has not been possible to take the steps necessary to integrate the reporting procedures.

The FLySIS system utilizes the BASIS (British Airways Safety Information System) software created by British Airways. In this database, safety relevant reports are stored and analyzed and the information found in this system is gleaned from confidential safety reports. The principle behind the confidential safety reports in FLySIS is that of "share your experience". Hence, it is a forum for people to report incidents that others may learn from and is non-punitive in design.

While FLySIS is the reporting system of interest, it should be noted that there are certain near misses that constitute mandatory reporting items (e.g., dangerous goods/bomb threat) and these items must be reported within 24 hours to the LBA (the German equivalent of the FAA). If a mandatory report is warranted, it cannot be confidential. For all other incidents, there is no time limit on reporting, thus, reports can be made at any time interval to FLySIS.

The use of confidential safety reporting, within the FLySIS reporting system, guarantees the person submitting the report absolute confidentiality, regardless of the information contained within the report. In addition to the guarantee of confidentiality, there is also a guarantee that information found within such reports will never be used for punitive purposes. Thus, unlike with the United Airlines "Get out of Jail Free" card for submitting a safety report, there is no such thing found within the Flight Safety Department at Lufthansa Airlines.

An exceptional event during a flight, that constitutes an emergency situation or a mandatory reporting item, must be reported to the respective fleet management. It is the

fleet management that retains the right to issue reprimands, remedial training, or some other type of punishment. Again, if either a paper and pencil or an electronic FLySIS report is submitted to the Flight Safety Department, no identity will be revealed and no punishment will be administered.

Confidentiality is maintained by de-identifying a report once it is issued. The report is then locked up in a secure office that can only be accessed by flight safety personnel. Because of the confidential nature of the report, there is no feedback loop in place for alerting the submitters of reports to what is being done as a result of the information that he or she supplied.

Once reports are submitted and de-identified, information from these confidential reports is entered into the BASIS program for integration and analysis. If there are follow-up questions, a flight safety representative will contact the person who submitted the report for clarification. If the information on the report seems particularly relevant and/or useful to other pilots, and provides a relevant learning example, the person who issued the report will be contacted and asked if an example of the information collected can be published. If the individual agrees, the report will be published (after a lag time of 6 months to further protect identity) in a quarterly journal issued by flight safety. This information may also be published in safety seminars, or examples shared at safety meetings.

With some airlines, the use of drugs and alcohol constitutes willful negligence and thus reports of such use can be used for punitive purposes, even if reported confidentially. Not so with the confidential reporting system used by Lufthansa. For example, if it comes to the attention of the safety department that a pilot or first officer is under the influence of substances while operating an aircraft, that person will be put into contact with substance abuse professionals and a peer support group. To maintain the confidentiality of that individual, he or she is still provided a flight schedule and entered into the system as if working, even though in reality he or she is seeking assistance for the problem and not operating an aircraft.

When asked why the confidential reporting system used with FLySIS works so well, representatives from flight safety indicated that its success is due to the guarantee of confidentiality and the fact that information gleaned is not used for punitive purposes. They also indicated that for such a system to be successful there must be a top-down commitment to safety whereby a non-punitive culture is established and a user-friendly reporting process is put into place.

British Airways

The standard for near miss reporting procedures has been established by British Airways, the industries leader in establishing the BASIS (British Airways Safety Information System) database that is used by over 100 airlines and is acknowledged as the industry standard by IATA. Specifically, the BASIS system is used for the aggregation and analysis of incidents and accidents. BASIS processes air safety reports in addition to information from the flight data recorders, human factors reports, ground handling,

engineering occurrences, and quality deficiencies. Thus, this software program is designed to process thousands of incident reports in an effort to determine trends and to determine what incidents are significant or may become significant. This system encourages the use of an open reporting environment and the use of "penalty free reporting". While this system discourages the use of confidential reporting, it does indicate that using reported information for punitive purposes could undermine the system and discourage employees from reporting due to fear of punishment.

The goal of BASIS is to provide better information on operational risks. For example, the flight safety department encourages users of the BASIS system to think in terms of the Heinrich Pyramid (see page . Essentially, this pyramid indicates that for every 1 major accident there are 3-5 less significant accidents, 7-10 incidents, and several hundred unreported occurrences. Thus, there is a possibility that the unreported occurrences of today could combine to become the accidents and incidents of tomorrow. The goal of BASIS is to analyze the data and to identify trends. Additionally, BASIS records and shows the progress of each incident investigation.

With the use of BASIS so widespread among airlines, an airline safety information exchange was created. Only a subset of data is exchanged and prior to doing this it is de-identified. The system can only be utilized when an airline inputs data, thus to participate in the exchange an airline must share their reports instead of just consuming the information from other airlines without offering an exchange. This free-flow of information allows airlines to learn from one another in open environment that encourages communication.

Flywise is the monthly digest of British Airways air safety reports. This digest is published by British Airways Safety Services and includes those safety incidents reported that have a risk assessment rating of "Medium" or higher. On occasion, reports that receive a "Low" or "Minimal" risk assessment are included as well. This digest is published with the intention of documenting the progress made in investigating the reports issued each month and entered into the BASIS database. Included in this publication is a breakdown of the number of reports received in a calendar month and how those incidents rated in terms of risk assessment (e.g., minimal, low, medium, high, severe). In addition to disseminating the information received by British Airways employees, there is a section at the end of the digest that reports "Other Operators' Accidents/Incidents". Finally, a comment sheet is also included to solicit feedback about this publication and how it may be improved.

British Airways is moving away from the use of confidential reporting to a more open reporting system, especially with flight crew. One of the reasons for this is the prevailing government regulations that identify mandatory reporting items. Because these types of items, and the reports they generate, are not confidential and because the culture of British Airways supports a penalty free reporting system, the safety department is encouraging the sole use of an open policy whereby the names of individuals filing reports are protected but are not confidential.

While a penalty free reporting system is the ideal, it does not preclude the use of punishment when negligence is reckless and/or willful. British Airways safety personal believe that their flight crew will report to work rested, alert, and sober and that if a mistake is made it may be a genuine error and not recklessness. If information supports the notion that a near miss resulted from negligence, punishment will occur and if it was a mistake, no penalty will be inflicted. If a near miss occurred as a result of crew negligence and the individual reported him - or herself, that fact will be taken into account when determining what disciplinary action should be taken.

When a report is filed, a thank you note is sent to the individual who made the report so that he or she knows that the information was successfully received. However, there is no follow-up or feedback loop regarding what has been or is being done with the information, unless disciplinary action is taken. If the individual wants more information regarding the outcome of reporting a specific incident he or she must follow-up with the flight safety department.

British Airways has set the standard with the use of their BASIS system. In fact in analyzing trends with this unique software, it was found that in 1991 less than 2000 reports were processed each year. In 1994, 4000 reports were processed, of which 123 (or 3%) were classified as "High" risk. In 2001, 9300 reports were processed, of which only 19 were classified as "High" risk (or.2%). Thus, it appears that with the BASIS system more information is being processed and steps are being taken to decrease the likelihood of a catastrophic accident from occurring.

Summary

The airline industry has made a number of advances in the last 20 years in the area of voluntary reporting. Starting with the ASRS system in 1975 and later with the ASAP programs in 1994. The ASAP programs are local, in the sense that they involve a partnership between a carrier, a labor organization, and the FAA. Significant increases in the amount of information and reporting have been noted following the implementation of these programs.

Question #2 – Voluntary Reporting in the Railroad Industry

Voluntary reporting is relatively unheard of in the railroad industry. For the most part, given the adversarial nature of the safety culture in the railroad industry, the climate is generally one of enforcement and compliance.

Many people feel that due to the current legal environment, in which an employee is required to establish negligence on the part of the railroad carrier in order to receive compenstaion for injuries sustained while at work, the relationship between carrier and employee is one that is not conducive to voluntary reporting. Voluntary reporting would establish negligence on the part of the employee and thereby reduce the likelihood of compensation. Thus, for the most part, current voluntary reporting programs in the rail industry utlize an 800 number through which individuals indicate the presence of unsafe conditions or circumstances or equipment which might negatively impact their safety.

The idea that an employee of the railroad would voluntarily report on their own performance error would be a significant improvement in determining the extent to which certain types of practices might occur in the work place. However, significant cultural change would need to occur prior to this type of event taking place.

Currently just about all of the major Class I railroad carriers have an 800 number for reporting safety concerns. These phone numbers are to be used by the employees to report unsafe conditions. For the most part, the railroads have gone to these numbers as a way of ensuring that there is a direct line of communication between the rank and file operating employees and upper management. These numbers are used occasionally by railroad employees, according to management personnel in the safety departments of two major railroads. However, according to railroad management, the types of concerns voiced on the calls have been plagued with inadequate information and lack of detail that permit a reasonable follow-up.

UK Railways

The situation with voluntary reporting of incidents is a little different in Britain. ScotRail and the University of Strathclyde originally developed CIRAS (Confidential Incident Reporting and Analysis System) in 1996. This followed a recommendation by the consultancy firm Vosper Thornycroft, that a no blame means of reporting safety concerns be implemented for staff. Following the Ladbroke Grove rail crash in 1999 government recommended that all UK rail companies be mandated to be involved in CIRAS. The UK national system officially came into existence in June of 2000.

According to information provided by Railtrack Safety, A National Steering Group oversees the system and is also the forum for policy making and development. This group is comprised of representatives from Railtrack Safety and Standards, Railtrack Line, Railway trade unions, the Association of Train Operating and Freight Operating Companies, the Infrastructure Safety Liaison Group and an independent human factors specialist.

To safeguard the system, and the data it produces, an independent CIRAS Charitable Trust has been set up. This trust acts to promote and protect the independence and integrity of the CIRAS system. Members include a representative from Railtrack Safety and Standards, Railway trade unions, a human factors academic, a member of the Rail Passenger Council, a representative of the core facility service provider, and representatives of rail employers.

Making a Report to CIRAS

The first step for someone wanting to report a safety concern is:

- to complete a brief report form
- **or** alternatively to phone their report directly to CIRAS

Report forms are available at depots and ticket booths, a form also appears at the back of a CIRAS journal. Once received, the information contained on the report form is then entered into the CIRAS database and all reports are followed up with a telephone call.

The report form asks for a name and home contact number. This information allows the CIRAS researcher to contact the person making the report to clarify and understand all the details of the report and most importantly, to ensure that any identifying information is de-identified so that confidentiality can be maintained.

A follow up interview is requested, but interviews are not mandatory and there is no obligation to provide further details if the person declines to do so. Where the individual does agree, the interview should take no longer than 20 minutes and is carried out over the telephone or at a location and time convenient to the person. Finally, all original reporting forms are returned to the individual, no copies of the form are made and no personal details retained, therefore it is impossible to link a particular report to a particular employee.

On receiving the report and after any follow up interview, the CIRAS researcher puts the information into the core database to allow analysis to be carried out. Over time, CIRAS staff analyze the information collected and obtain comments and input from the industry. The results are then published in a periodic journal that is circulated to safety critical staff and other relevant industry bodies. This journal highlights trends, spots common factors (or solutions) and identifies developing concerns and issues that may compromise safety. Feedback on issues raised and the contents of the journal is positively encouraged, via the "Postbag" section of the journal.

The Core Facility

Central to CIRAS is the core facility, which covers the whole of the national scheme, incorporating data from regional facilities into the national core database.

The core activities are:

- Maintenance and development of the core database
- Ensuring the security and confidentiality of the core database
- Establishment and maintenance of national system standards
- Providing training and support to regional facilities
- Providing a national analysis service
- Determining trends in health and safety issues of national importance and preparing articles for inclusion in regional publications
- Publishing the results of national findings at least twice a year

The Regions

Three Regional Facilities share the common goal of obtaining and collating the safety concerns of railway staff across the United Kingdom and providing data to the national database. Suitably trained and experienced researchers within the Human Factors area staff each facility.

The activities of the regional facilities comprise:

- Providing assistance to the companies in the briefing of all safety critical and safety related employees on how CIRAS works and how to make a report
- Receiving reports from employees, conducting follow-up interviews and obtaining responses from companies, as required and laid down by nationally agreed standards
- Providing data to the national database
- Collating responses to all reports from the rail member companies
- Publishing regional journals, including reports of national importance provided by the core facility
- Ensuring that the regional journals are widely distributed and easily available to all safety critical and safety related employees of the rail organizations involved

Region 1- Scotland and London North Eastern

Region2 - North Western, Midlands and East Anglia

Region 3 - Southern and Great Western

Confidentiality

The system is completely confidential and security is paramount. Under no circumstances will CIRAS reveal the identity of anyone who has given a report. Staff must trust the system as it stands and falls on that basis. All information collected by the system is coded and stored on a database designed specifically for CIRAS.

Once the information has been included in the system, and the decision whether or not to follow-up the report has been made, the initial reporting form is returned to the person reporting to keep or destroy as they wish. No copies are made or kept by CIRAS or made available to any other industry party.

Independent Ownership

The national system and the core database are owned by the CIRAS Charitable Trust and it remains fully independent of any rail or rail-related company. CIRAS reports are processed by one of three regional facilites which produce quarterly reports and magazines with summaries of the incidents and concerns. A central facility receives all reports and manages a national database which provides a comprehensive report every six months.

Summary of Recent Findings

The most recently published report of the CIRAS database that was available covers the period from March 1 to August 31 2001. During that time the core facility received 559 CIRAS interview reports. These contained 533 general issues and 85 specific incidents, making a total of 618 issue and incident reports. From these reports the following statistics were derived. The most common types of problem reported for the different areas of problems were:

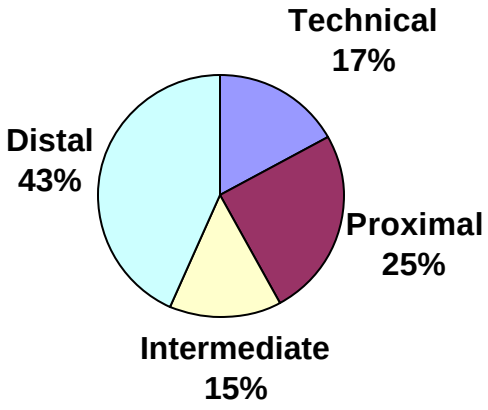

Figure 8. Types of Incidents Coded in CIRAS

These factors are defined as follows:

Technical	Design issues or ongoing defects
Proximal	Rule violation, fatigue. Attention or deistratcion
Intermediate	Communication , training, rule violation, task management
Distal	Procedures/documenta, Organization of resources, rostering

The overall issue to incident ratio for the six month period was 6:1. However, the ratio is not constant over the different problem types. Two of the areas showing a lower ration are 'work practice' and 'communication'. It is possible that issues in these areas are more likley to become incidents than in other areas.

The most common Journals, which report on the incidents that are reported to CIRAS, indcate that a wide range of topics are reported. The most common theme however, appears to be shift rostering and fatigue. Reports indicate a concern about the length of shift, insufficient rest periods, and pressure to work on rest days. While the decision to work or not rests with the individual, there may be a concern here. In addition, some reports question whether there is any rule that prohibits a person from working another job while being employed by the railroad. CIRAS is apparently reviewing other ways of coding its data to provide better root cause analysis.

A recent summary of the data was published in a report on the CIRAS web site. The data presented in the report show the source of the reports, the main types of reports, and a breakdown of the issues associated with the most commonly occurring report – work/rest or rostering issues.

The following graph from the report indicates that the reports are coming from different companies in the UK rail system. A total of 800 reports came from Train Operating Companies (TOC), about 175 from Freight Operating Companies (FOC), about 275 from Contractor Companies, and a little over 220 from Railtrack.

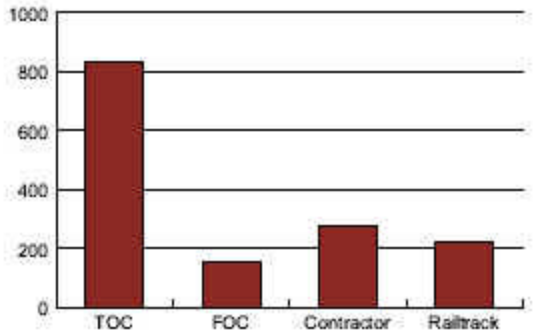

Figure 9. Sources of CIRAS reports.

The reports that were submitted come from a number of different job categories. These are reflected in the following figure.

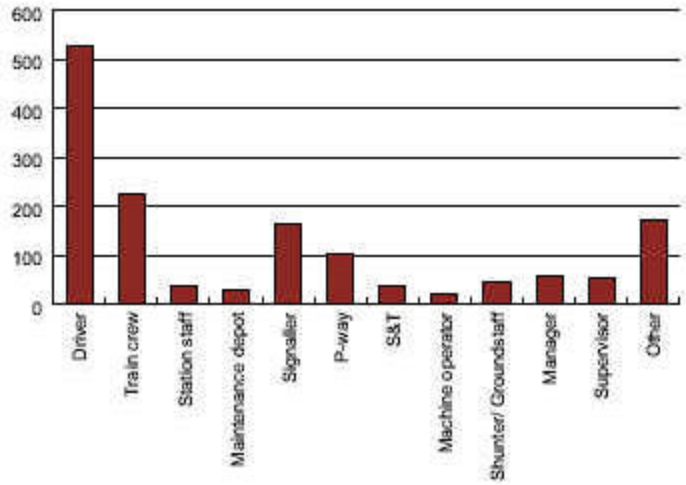

Figure 10. CIRAS reports by job category.

An analysis of the reports conducted by the CIRAS staff suggests that the two largest categories of reports deal with work/rest and rostering issues and training and job briefing issues. Figure 11 identifies the types of concerns found in the various reports submitted. The largest group has to do with insufficient staff on duty (31%) followed by poor shift design (21%), long shifts (16%), and inadequate rest periods (11%), inadequate cover (6%), long travel times (3%), and inadequate lodge stays (1%), about 6% were not specified further – which may mean other or unclassifiable.

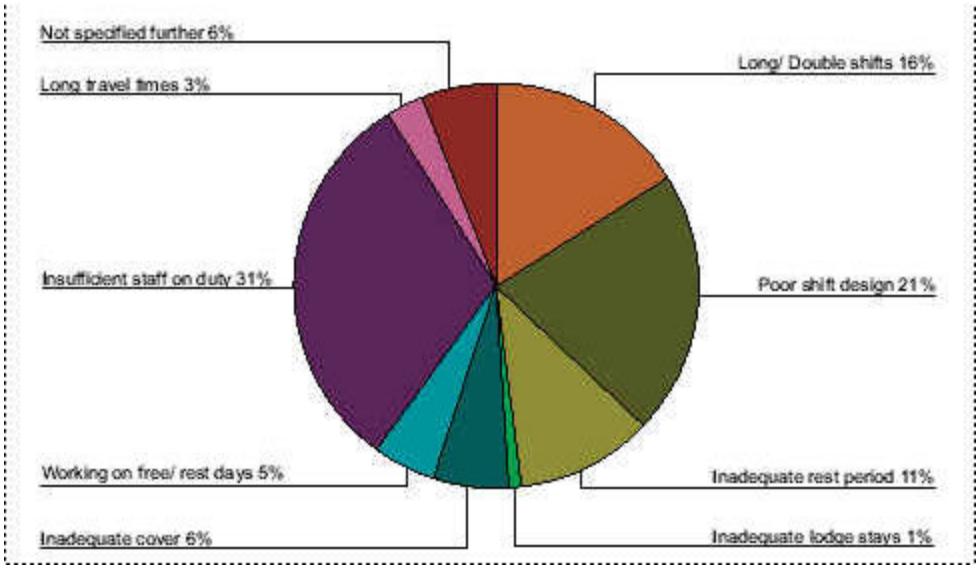

Figure 11. Types of concerns reported to CIRAS about work rest issues.

The executive report identified a number of issues and concerns as a result of this analysis which reflects how such data might be used in the US. Reccomendations were included in the report which suggest remedies for all of the concerns reported.

In general, the CIRAS system shows a high degree of development in gathering, analyzing, and suggesting action based on the reports and data collected.

Question #3 - Current Developments and Next Steps

In addition to investigating the voluntary reporting activity in the UK and other countries it was decided that discussions with railroad management and labor in the US would also be helpful. In addition, a pilot database reporting system was also constructed to determine whether it would be feasible to establish an on-line reporting system.

Discussions with US Railroad Personnel

Management

Several key individuals who hold the title of Director of Safety on several railroads were approached to discuss their reactions to the idea of developing a voluntary reporting system. Reactions to the idea were mixed. Initially, railroad management personnel indicated that they already had a voluntary reporting system and referred us to the 800 toll free numbers.

However, at the same time they indicated that the quality and reliablilty of the data received over these mechanisms was not very helpful. For the most part, it appeared that individuals reporting on the toll free lines were usually not well informed about rules and procedures and were in need of additional educational consultation.

When the issue of immunity was raised most of the respondents felt that they would need considerable additional information before a response could be formulated. However, they were not immediately against the idea.

The overall culture of US railroads is not likely to easily accept such programs without the enactment of various safeguards that would start to break down the culture of fear that currently pervades many railroad companies. One contributing factor to this culture is the fact that US railroads conduct operations testing as a way of determining the extent to which train crews are performing train operations and handling correctly. The degree to which individuals perform operations procedures correctly is collected and analyzed. Additional training might be put in place in locations where operations are not performed correctly. Unfortunately, operations testing is often done in such a way as to engender suspicion among the ranks of train crews. In fact, the operations testing done by supervisors and management is often described as entrapement and that railroad personnel are "hiding in the weeds" in an effort to catch unsuspecting train crews engaged in poor performance of their jobs. While there is a need for management to ensure that the workforce is performing duties correctly this practice contributes to an atmosphere of suspicion and distrust. Some railroads have programs labeled "stealth operations testing teams" which examine various locations, write reports, and then meet with local management to pursue an explanation of why certain operations are not being performed correctly. Thus, lending further fuel to the fear that one might be caught at anytime.

Some of the directors of safety recognize that this culture may contribute to the lack of quality information that is received. The realization that additional information about safe or unsafe practices and conditions would be helpful in addressing safety concerns is present in the US railroad industry. In addition, the idea that the voluntary reporting of information would be an improvement is very appealing. However, the practical realities will require a concerted effort to overcome the culture of fear that currently exists.

Labor Organizations

Based on the information gathered in the review, it was possible to discuss the feasability of implementing a pilot program that would involve confidential voluntary reporting. In the course of our discussions regarding this topic, it became apparent that the labor unions were very favorably impressed with the possibilities that this type of reporting system would provide.

We discussed the possibility of the program being piloted at one or two locations around the system. In particular, a discussion with a local chairman from a district in the midwest, was very favorable. He volunteered his location for this type of project.

Additional discussions were held with senior vice presidents of the UTU. These conversations were also very positive. The leaders were unanimous however, in their concern with both confidentiality and the need for an incentive to report the information. The leaders expressed an interest in pursuing this approach.

Discussion of these topics focused on the need for for a national database, with more detailed discussion of issues and concerns, that might be of interest to the entire nation and not just the compliance issues generated by the FRA reporting process. The labor leaders were also concerned with the need to develop instructional materials that correspond to the needs of the individuals contributing voluntary reports.

Pilot Web Based Reporting Project

Another important aspect of the project was the development of a pilot web-based reporting form that could be used for discussion purposes with railroad labor and management groups. This website could be used for pilot projects and demonstrations for beta testing of the concept. Accordingly, a rudimentary web page, with full functional capabilities, was developed and uploaded for this project.

This website is fully functional and can easily accommodate the input of relevant incident information into a **secure data base**. Individual reports are submitted to the secure database which can then be processed for report generation. As can be seen on our website (http://www.freecfm.com/a/areport/) there is an overall description of the purpose of the project. This is followed by discussions of the anonymity and confidentiality issues and the fact that the website is secure.

It should be noted that a pilot project would need to *ensure confidentiality but not anonymity*. The reason for this would be to first ensure that voluntary reports would result in immunity for those making the reports. Second, in order to ensure that persons not making the report, but possibly implicated in reports, not be unfairly or innacurately identified, the requirement that reports *not be anonymous* would provide some safeguards for other railroad employees.

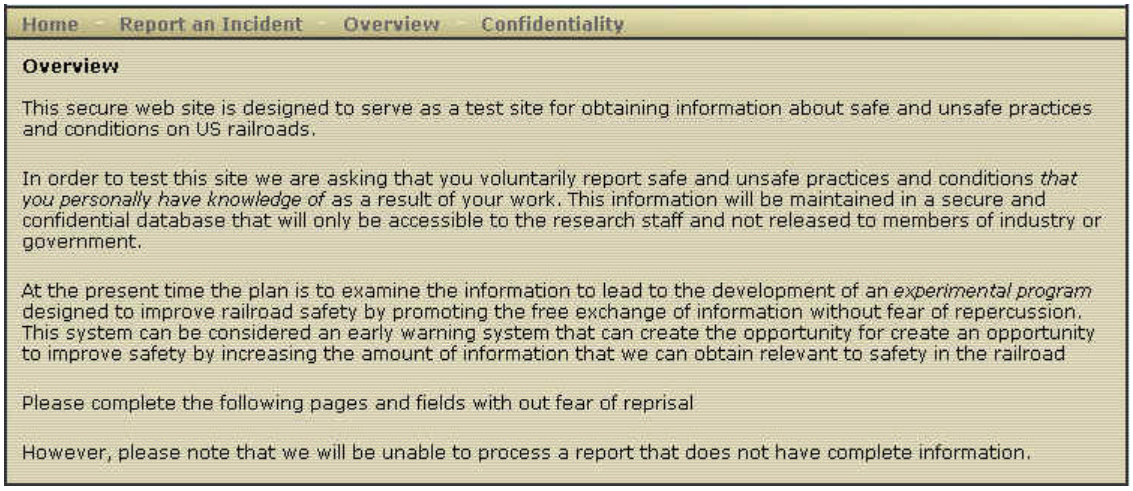

Figure 12. Pilot web page overview.

Following the introduction to the project there is a web-based form that a person can voluntarily complete on line. The form requests several pieces of information including location, conditions, and details of the incident or condition that may have occurred.

The intention will be to prepare semi-annual and other periodic reports. Such reports would list specific incidents and other items or issues that are being reported. It is important that the data be properly coded in order to be able to examine the potential root causes of these incidents.

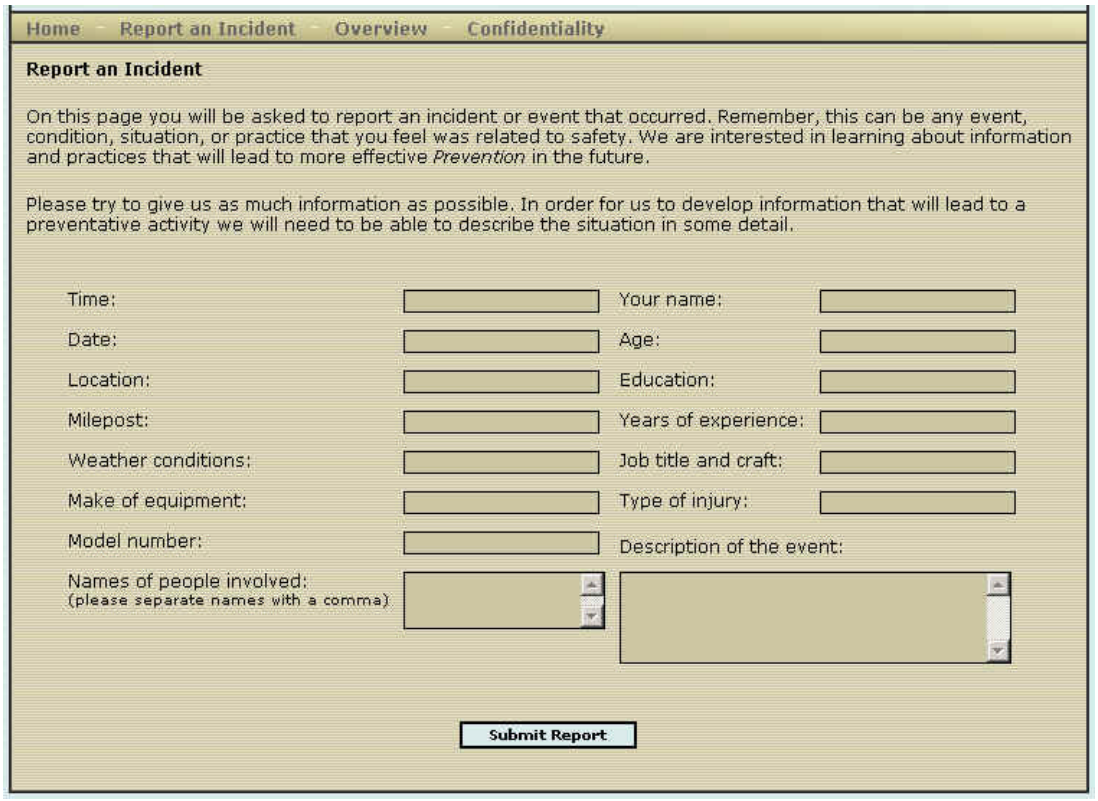

Figure 13. Web Form for Incident Reporting

The form depicted in Figure 13 prompts the respondent for a number of items of information. It was decided at this time to include a request for a name so that the contents of the incident could be verified by the research staff as needed. However, these identifying items could be removed from the database as soon as verification took place. Additional information on the nature and circumstances of the event or incident could also be reported as needed.

Since this web page was only intended to demonstrate the feasibility of such a project, no effort was made to prepare a completely user friendly format. However, the essential ease and usability of the page is maintained.

The database, as currently constructed, is secure, and can only be accessed by the research staff. Currently, the database has the capacity for several thousand reports and can be downloaded and converted to a Microsoft Access format for additional analysis and storage.

Conclusions and Reccomendations

1. Several modes of transportation, with locations around the world are using voluntary reporting programs with apparent success. The FAA, in partnership with the aviation industry and aviation labor organizations, are moving to expand these types of programs into more and more venues. At present there are over 30 such programs in existence.
2. The success of a voluntary reporting program appears to depend upon the voluntary participation of the reporters. Accordingly, the need for *trust* between the parties involved is paramount.
3. In order to encourage people to use the system, very *secure safeguards* need to be in place in order for the program to have credibility.
4. In addition, the need for significant *incentives* to encourage the use of such a program is also critical. In the US aviation industry the incentive is *immunity* from disciplinary action, if cetain conditions are met.
5. The need to educate people as to what can be done with this type of information is critical. Airlines are using the information on a monthly basis to make changes in operations, revise procedures, and modify training programs.
6. It is recommended that a pilot project be attempted to demonstrate the effectiveness of these programs in the railroad industry.

Proposed Pilot Project

1. A pilot program for the voluntary reporting of safety relevant information and activity will be developed at a specific location.
2. Presently, one local chairman has volunteered his location to participate in the project.
3. Senior members of the labor organization have expressed an interest in this program.
4. FRA would need to co-sponsor such a program with labor and management and will need to propose a waiving of penalties (as appropriate) for individuals and the rail carrier in a pilot location so that a program can be initiated.
5. A carrier will need to be selected which would ensure that there would be no punitive consequences following the occurrence of a rule violation or infraction.
6. Develop *immunity policies* related to voluntary reporting.
7. Labor groups will need to be identified that will participate in the development of a program of this sort.

8. Use of a confidential, but not anonymous, method of reporting and analyzing the information would be need to be established.
9. Certain limitations will need to be identified to prevent the abuse of such a system.
10. Data on accident frequency, reportables, and various operations procedures will need to be collected by a third party prior to the implementation of such a program for evaluation purposes.
11. Data on organizational culture and attitudes towards the organization and perceptions about the value of such a program would need to be gathered prior to implementation in order to permit evaluation.
12. Once begun, a committee of key individuals will need to be formed (consisting or labor, management, and FRA) that will identify the parameters of the program (including time frames and associated costs), the reporting procedures, and the criteria for events or information to be included in the program.
13. Additionally, this committee would need to identify the corrective actions that will be taken.
14. Training would need to be provided to all participants in the program to ensure that they would understand reporting procedures, policies, etcetera.
15. Training for persons involved in the event review committee as to how to achieve consensus and resolve conflict will also need to be provided.
16. A procedure and mechanism for disseminating the results to the local workforce will need to be discussed and developed.
17. A procedure and repository for the information will need to identified and established.
18. A group of railroad management, railroad labor, and FRA will need to be convened to address and respond to the reports generated.

References

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Yantiss, W. (2002). Personal communication.

Note 1. ASRS Program Overview. http://asrs.arc.nasa.gov/

Note 2. Reporting Forms. http://asrs.arc.nasa.gov/forms.htm

Note 3. ASRS Database Report Sets - Flight Crew Fatigue Reports FAR 121. (http://asrs.arc.nasa.gov/report_sets.htm)

Appendix A . Sample ASAP Memorandum of Understanding

Executive Star Airlines

AVIATION SAFETY ACTION PROGRAM (ASAP)

FOR

pilots

MEMORANDUM OF UNDERSTANDING

1. GENERAL. Executive Star Airlines (ESA) is a Title 14 of the Code of Federal Regulations (14 CFR), air carrier operating under Part 121 engaged in scheduled passenger service within North and South America, Europe, and Asia. ESA operates 300 aircrafts, and employs approximately 5,000 pilots. The pilots are represented by the Executive Pilots Labor Association (EPLA).

2. PURPOSE. The Federal Aviation Administration (FAA), **ESA, and the EPLA** are committed to improving flight safety. Each party has determined that safety would be enhanced if there were a systematic approach for **pilots** to promptly identify and correct potential safety hazards. The primary purpose of the **ESA** Aviation Safety Action Program (ASAP) is to identify safety events, and to implement corrective measures that reduce the opportunity for safety to be compromised. In order to facilitate flight safety analysis and corrective action, **ESA and the EPLA join** the FAA in voluntarily implementing this ASAP for **pilots**, which is intended to improve flight safety through **pilot** self-reporting, cooperative follow-up, and appropriate corrective action. This Memorandum of Understanding (MOU) describes the provisions of the program.

3. BENEFITS. The program will foster a voluntary, cooperative, nonpunitive environment for the open reporting of safety of flight concerns. Through such reporting, all parties will have access to valuable safety information that may not otherwise be obtainable. This information will be analyzed in order to develop corrective action to help solve safety issues and possibly eliminate deviations from 14 CFR. For a report accepted under this ASAP MOU, the FAA will use lesser enforcement action or no enforcement action, depending on whether it is a sole-source report, to address an event involving possible noncompliance with 14 CFR. This policy is referred to in this MOU as an "enforcement-related incentive."

4. APPLICABILITY. The **ESA** ASAP applies to all **pilot** employees of **ESA** and only to events that occur while acting in that capacity. Reports of events involving apparent noncompliance with 14 CFR that is not inadvertent or that appears to involve an

intentional disregard for safety, criminal activity, substance abuse, controlled substances, alcohol, or intentional falsification are excluded from the program.

a. Events involving possible noncompliance with 14 CFR by **ESA** that are discovered under this program may be handled under the Voluntary Disclosure Policy, provided that **ESA** voluntarily reports the possible noncompliance to the FAA and that the other elements of that policy are met. (See the current version of AC 00-58, Voluntary Disclosure Reporting Program, FAA Order 2150.3A, Compliance and Enforcement Program, and Compliance/Enforcement Bulletin No. 90-6).

b. Any modifications of this MOU must be accepted by all parties to the agreement.

5. PROGRAM DURATION. This is a Demonstration Program, the duration of which shall be 18 months from the date this MOU is signed by the FAA (following signature by the other parties). If the program is determined to be successful after a comprehensive review and evaluation, the parties intend for it to be a Continuing Program. This ASAP may be terminated at any time for any reason by ESA, the FAA, or any other party to the MOU. The termination or modification of a program will not adversely affect anyone who acted in reliance on the terms of a program in effect at the time of that action; i.e., when a program is terminated, all reports and investigations that were in progress will be handled under the provisions of the program until they are completed. Failure of any party to follow the terms of the program ordinarily will result in termination of the program. Failure of ESA to follow through with corrective action acceptable to the FAA to resolve any safety deficiencies ordinarily will result in termination of the program.

6. REPORTING PROCEDURES. When a **pilot** observes a safety problem or experiences a safety-related event, he or she should note the problem or event and describe it in enough detail so that it can be evaluated by a third party.

a. ASAP Report Form. At an appropriate time during the workday (e. g. after the trip sequence has ended for the day), the employee should complete **ESA** ASAP Form (**ESA Form ASAP-1234**) for each safety problem or event and submit it by **company mail** to the Director of Flight Safety, ATTN: ASAP Manager. **If the safety event involves a deviation from an ATC clearance, the pilot should note the date, time, place, altitude, flight number, and ATC frequency, along with enough other information to fully describe the event and any perceived safety problem.**

b. Time Limit. Reports that the ERC determines to be sole-source will be accepted under the ASAP, regardless of the timeframe within which they are submitted, provided they otherwise meet the acceptance criteria of paragraphs 11a(2) and (3) of this MOU. Reports which the ERC determines to be non sole-source must meet the same acceptance criteria, and must also be filed within one of the following two possible timeframes:

(1) Within 24 hours after **the end of the flight sequence for the day of occurrence**, absent extraordinary circumstances. For example, if the event occurred at 1400 hours on Monday and a **pilot** completes the **flight sequence** for that day at 1900 hours, the report should be filed no later than 1900 hours Tuesday**.** In order for all employees to be covered under the ASAP for any apparent noncompliance with 14 CFR resulting from an event, they must all sign the same report or submit separate signed reports for the same event. If the **company mail** system is not available to the **pilot** at the time he or she needs to file a report, the employee may contact the ASAP manager's office and file a report via fax or telephone within 24 hours after **the end of the flight sequence for the day of occurrence**, absent extraordinary circumstances. Reports filed telephonically within the prescribed time limit must be followed by a formal report submission within three calendar days thereafter.

(2) Within 24 hours of having become aware of possible noncompliance with 14 CFR provided the following criteria are met: If a report is submitted later than the time period after the occurrence of an event stated in paragraph 6b(1) above, the ERC will review all available information to determine whether the **pilot** knew or should have known about the possible noncompliance with 14 CFR within that time period. If the ERC determines that the employee did not know or could not have known about the possible noncompliance with 14 CFR until informed of it, then the report would be included in ASAP, provided the report is submitted within 24 hours of having become aware of possible noncompliance with 14 CFR, and provided that the report otherwise meets the acceptance criteria of this MOU. If the employee knew or should have known about the possible noncompliance with 14 CFR, then the report will not be included in ASAP.

c. Non-reporting employees covered under this ASAP MOU. If an ASAP report identifies another covered employee in an event involving possible noncompliance with 14 CFR and that employee has neither signed that report nor submitted a separate report, the ERC will determine on a case-by-case basis whether that employee knew or reasonably should have known about the possible noncompliance with 14 CFR. If the ERC determines that the employee did not know or could not have known about the apparent possible noncompliance with 14 CFR, and the original report otherwise qualifies for inclusion under ASAP, the ERC will offer the non-reporting employee the opportunity to submit his/her own ASAP report. If the non-reporting employee submits his/her own report within 24 hours of notification from the ERC, that report will be afforded the same consideration under ASAP as that accorded the report from the original reporting employee, provided all other ASAP acceptance criteria are met. However, if the non-reporting employee fails to submit his/her own report within 24 hours of notification from the ERC, the possible noncompliance with 14 CFR by that employee will be referred to an appropriate office within the FAA for additional investigation and reexamination and/or enforcement action, as appropriate, and for referral to law enforcement authorities, if warranted.

d. Non-reporting employees not covered under this ASAP MOU. If an ASAP report identifies another **ESA** employee who is not covered under this MOU, and the report indicates that employee may have been involved in possible noncompliance with 14 CFR, the ERC will determine on a case-by-case basis whether it would be appropriate to offer that employee the opportunity to submit an ASAP report. If the ERC determines that it is appropriate, the ERC will provide that employee with information about ASAP and invite the employee to submit an ASAP report. If the employee submits an ASAP report within 24 hours of notification from the ERC, that report will be covered under ASAP, provided all other ASAP acceptance criteria are met. If the employee fails to submit an ASAP report within 24 hours of notification from the ERC, the possible noncompliance with 14 CFR by that employee will be referred to an appropriate office within the FAA for additional investigation and reexamination and/or enforcement action, as appropriate, and for referral to law enforcement agencies, if warranted.

7. POINTS OF CONTACT. The ERC will be comprised of one representative from **ESA** management; **one representative from the EPLA**; and one FAA inspector assigned as the ASAP representative from the Certificate Holding District Office (CHDO) for **ESA**; or their designated alternates in their absence. In addition, **ESA** will designate one person who will serve as the ASAP manager. The ASAP manager will be responsible for program administration, and will not serve as a voting member of the ERC.

8. ASAP MANAGER. When the ASAP manager receives the report, he or she will record the date and time of any event described in the report and the date and time the report was submitted through the **company mail** system. The ASAP manager will enter the report, along with all supporting data, on the agenda for the next ERC meeting. The ERC will determine whether a report is submitted in a timely manner or whether extraordinary circumstances precluded timely submission. To confirm that a report has been received, the ASAP manager will send a written receipt through the **company mail** system to each employee who submits a report. The receipt will confirm whether or not the report was determined to be timely. The ASAP manager will serve as the focal point for information about, and inquiries concerning the status of, ASAP reports, and for the coordination and tracking of ERC recommendations.

9. EVENT REVIEW COMMITTEE (ERC). The ERC will review and analyze reports submitted by the **pilots** under the program, identify actual or potential safety problems from the information contained in the reports, and propose solutions for those problems. The ERC will provide feedback to the individual who submitted the report.

a. The ASAP manager will maintain a database that continually tracks each event and the analysis of those events. The ERC will conduct a 12-month review of the ASAP database with emphasis on determining whether corrective actions have been effective in preventing or reducing the recurrence of safety-related events of a similar nature. That

review will include recommendations for corrective action for recurring events indicative of adverse safety trends.

b. This review is in addition to any other reviews conducted by the FAA. The ERC will also be responsible for preparing a final report on the demonstration program at its conclusion. If an application for a continuing program is anticipated, the ERC will prepare and submit a report with the certificate holder's application to the FAA 60 days in advance of the termination date of the demonstration program.

10. ERC PROCESS.

a. The ERC will meet as necessary to review and analyze reports that will be listed on an agenda submitted by the ASAP manager. The ERC will determine the time and place of the meeting. The ERC will meet at least twice a month, and the frequency of meetings will be determined by the number of reports that have accumulated or the need to acquire time critical information.

b. The ERC will make its decisions involving ASAP issues based on consensus. Under the **ESA** ASAP, consensus of the ERC means the voluntary agreement of all representatives of the ERC. It does not require that all members believe that a particular decision or recommendation is the most desirable solution, but that the result falls within each member's range of acceptable solutions for that event in the best interest of safety. In order for this concept to work effectively, each ERC representative shall be empowered to make decisions within the context of the ERC discussions on a given report. The ERC representatives will strive to reach consensus on whether a reported event is covered under the program, how that event should be addressed, and the corrective action or any enforcement action that should be taken as a result of the report. For example, the ERC should strive to reach a consensus on the recommended corrective action to address a safety problem such as an operating deficiency or airworthiness discrepancy reported under ASAP. The corrective action process would include working the safety issue(s) with the appropriate departments at the airline and the FAA that have the expertise and responsibility for the safety area of concern. Recognizing that the FAA holds statutory authority to enforce the necessary rules and regulations, it is understood that the FAA retains all legal rights and responsibilities contained in Title 49, United States Code, and FAA Order 2150.3A. In the event there is not a consensus of the ERC on decisions concerning a report involving an apparent violation(s), a qualification issue, or medical certification or medical qualification issue, the FAA ERC representative will decide how the report should be handled. The FAA will not use the content of the ASAP report in any subsequent enforcement action, except as described in paragraph 11a(3) of this MOU.

c. It is anticipated that three types of reports will be submitted to the ERC: safety-related reports that appear to involve a possible noncompliance with 14 CFR; reports that are of a general safety concern, but do not appear to involve possible noncompliance with 14

CFR; and any other reports: e.g., involving catering and passenger ticketing issues. All safety-related reports shall be fully evaluated and, to the extent appropriate, investigated.

d. The ERC will forward non-safety reports to the appropriate **ESA** department head for his/her information and, if possible, internal (**ESA**) resolution. For reports related to flight safety, including reports involving possible noncompliance with 14 CFR, the ERC will analyze the report, conduct interviews of reporting **pilots**, and gather additional information concerning the matter described in the report, as necessary**.**

e. The ERC should also make recommendations to **ESA** for corrective action for systemic issues. For example, such corrective action might include changes to **ESA** flight operations procedures, aircraft maintenance procedures, or modifications to the training curriculum for **pilots**. Any recommended changes that affect **ESA** will be forwarded through the ASAP manager to the appropriate department head for consideration and comment, and, if appropriate, implementation. The FAA will work with **ESA** to develop appropriate corrective action for systemic issues. The ASAP manager will track the implementation of the recommended corrective action and report on associated progress as part of the regular ERC meetings. Any recommended corrective action that is not implemented should be recorded along with the reason it was not implemented.

f. When the ERC becomes aware of an issue involving the medical qualification or medical certification of an airman, the ERC must immediately advise the appropriate Regional Flight Surgeon about the issue. The ERC will work with the Regional Flight Surgeon and the certificate holder's medical department or medical consultants to resolve any medical certification or medical qualification issues or concerns revealed in an ASAP report, or through the processing of that report. The FAA ERC member must follow the direction(s) of the Regional Flight Surgeon with respect to any medical certification or medical qualification issue(s) revealed in an ASAP report.

g. Any corrective action recommended by the ERC for a report accepted under ASAP must be completed to the satisfaction of all members of the ERC, or the ASAP report will be excluded from the program, and the event will be referred to the FAA for further action, as appropriate.

h. Use of the **ESA** ASAP Report: Neither the written ASAP report nor the content of the written ASAP report will be used to initiate or support any company disciplinary action, or as evidence for any purpose in an FAA enforcement action, except as provided in paragraph 11a(3) of this MOU. The FAA may conduct an independent investigation of an event disclosed in a report.

11. FAA ENFORCEMENT.

a. Criteria for Acceptance. The following criteria must be met in order for a report to be covered under ASAP:

(1) The employee must submit the report in accordance with the time limits specified under paragraph 6 of this MOU;

(2) Any possible noncompliance with 14 CFR disclosed in the report must be inadvertent and must not appear to involve an intentional disregard for safety; and,

(3) The reported event must not appear to involve criminal activity, substance abuse, controlled substances, alcohol, or intentional falsification. Reports involving those events will be referred to an appropriate FAA office for further handling. The FAA may use the content of such reports for any enforcement purposes and will refer such reports to law enforcement agencies, if appropriate. If upon completion of subsequent investigation it is determined that the event did not involve any of the aforementioned activities, then the report will be referred back to the ERC for a determination of acceptability under ASAP. Such referred back reports will be accepted under ASAP provided they otherwise meet the acceptance criteria contained herein.

b. Administrative Action. Notwithstanding the criteria in paragraph 205 of FAA Order 2150.3A, possible noncompliance with 14 CFR disclosed in a non sole-source ASAP report that is covered under the program and supported by sufficient evidence will be addressed with administrative action (i.e., a FAA Warning Notice or FAA Letter of Correction, as appropriate). Sufficient evidence means evidence gathered by an investigation not caused by, or otherwise predicated on, the individual's safety-related report. There must be sufficient evidence to prove the violation, other than the individual's safety-related report. In order to be considered sufficient evidence under ASAP, the ERC must determine through consensus that the evidence (other than the individual's safety-related report) would likely have resulted in the processing of a FAA enforcement action had the individual's safety-related report not been accepted under ASAP. Accepted non sole-source reports for which there is not sufficient evidence will be closed with a FAA Letter of No Action.

c. Sole-Source Reports. A report is considered a sole-source report when all evidence of the event is discovered by or otherwise predicated on the report. Apparent violations disclosed in ASAP reports that are covered under the program and are sole-source reports will be addressed with an ERC response (no FAA action). It is possible to have more than one sole-source report for the same event.

d. Reports Involving Qualification Issues. **ESA** ASAP reports covered under the program that demonstrate a lack, or raise a question of a lack, of qualification of a certificate holder employee will be addressed with corrective action, if such action is appropriate and recommended by the ERC. If an employee fails to complete the corrective action in a manner satisfactory to all members of the ERC, then his/her report will be excluded from ASAP. In these cases, the ASAP event will be referred to an appropriate office within the FAA for any additional investigation and reexamination and/or enforcement action, as appropriate.

e. Excluded from ASAP. Reported events involving possible noncompliance with 14 CFR that are excluded from ASAP will be referred by the FAA ERC member to an appropriate office within the FAA for any additional investigation and re-examination and/or enforcement action, as appropriate.

f. Corrective Action. Employees initially covered under an ASAP will be excluded from the program and not entitled to the enforcement-related incentive if they fail to complete the recommended corrective action in a manner satisfactory to all members of the ERC. Failure of an employee to complete the ERC recommended corrective action in a manner satisfactory to all members of the ERC may result in the reopening of the case and referral of the matter for appropriate action.

g. Repeated Instances of Noncompliance with 14 CFR. Reports involving the same or similar possible noncompliance with the Regulations that were previously addressed with administrative action under ASAP will be accepted into the program, provided they otherwise satisfy the acceptance criteria in paragraph 6 above. The ERC will consider on a case-by-case basis the corrective action that is appropriate for such reports.

h. Closed Cases**.** A closed ASAP case including a related enforcement investigative report involving a violation addressed with the enforcement-related incentive, or for which no action has been taken, may be reopened and appropriate enforcement action taken if evidence later is discovered that establishes that the violation should have been excluded from the program.

12. EMPLOYEE FEEDBACK. The ASAP manager will publish a synopsis of thereports received from **pilots** in the ASAP section of the **monthly** publication ***Executive Update***. The synopsis will include enough information so that **pilots** can identify their reports. Employee names, however, will not be included in the synopsis. The outcome of each report will be published. Any employee who submitted a report may also contact the ASAP manager to inquire about the status of his/her report. In addition, each employee who submits a report accepted under ASAP will receive individual feedback on the final disposition of the report.

13. INFORMATION AND TRAINING. The details of the ASAP will be made available to all **pilots** and their supervisors by publication in the **ESA *Executive Operations Manual***. Each **ESA pilot** and manager will receive written guidance outlining the details of the program at least two (2) weeks before the program begins. Each **pilot** will also receive additional instruction concerning the program during the next regularly scheduled recurrent training session, and on a continuing basis in recurrent training thereafter. All new-hire **pilot** employees will receive training on the program during initial training.

14. REVISION CONTROL. Revisions to this MOU shall be documented using standard revision control methodology.

15. RECORDKEEPING. All documents and records regarding this program will be kept by the **ESA** ASAP manager and made available to the other parties of this agreement at their request. All records and documents relating to this program will be appropriately kept in a manner that ensures compliance with 14 CFR and all applicable law **(including the Pilot Records Improvement Act)**. **The EPLA and** the FAA will maintain whatever records they deem necessary to meet their needs.

16. SIGNATORIES. All parties to this ASAP are entering into this agreement voluntarily.

_____ _____

President, Executive Pilots Labor Association Date

_____ _____

Director of Flight Safety, Executive Star Airlines Date

_____ _____

Manager, FAA CHDO Date

For Executive Star Airlines

Appendix B . Sample ASRS Flight Crew Reports

Report #1

Narrative :
KNOXVILLE APCH, TWR, GND CLRED US FOR A VISUAL APCH TO KNOXVILLE (TYS) RWY 23R. THE FO FLEW THE APCH AND LNDG AND I TOOK THE ACFT BACK AT THE END OF THE ROLLOUT. I TURNED L AT THE END, THEN L AGAIN ONTO PARALLEL TXWY B. I ADDED PWR AS THERE IS AN UPHILL GRADE IN THAT DIRECTION. THE CTLR HAD CLRED US TO TAXI TO AND HOLD SHORT OF THE APCH END OF RWY 23R. WE PROCEEDED ALONG, NOTING A DC9 LNDG ON RWY 23R. AS WE TAXIED, WE DID OUR AFTER LNDG CHKLIST. THE CTLR MADE A RADIO CALL TO THE OTHER PLANE TO MAKE A 180 DEG TURN ON THE RWY AND TAXI TO THE RAMP (UNSPOKEN BUT UNDERSTOOD TO BE VIA TXWY G7), AND I THOUGHT HE CLRED US IN THE SAME CALL, TO CROSS RWY 23R AT THE END AND TAXI IN (SAME RAMP). THE ADDED PWR HAD GIVEN US A GOOD SPD ON TXWY B AND SO WE REACHED THE END FAIRLY QUICKLY. UPON ROUNDING THE CORNER AT TXWY B AND B8, I NOTICED THE DC9 TURNING OFF ON G7, WHICH FIT WITH MY UNDERSTANDING OF WHO WAS TO GO WHERE. I CROSSED THE END OF RWY 23R AND ONTO TXWY G8. THEN THE CTLR SAID ON THE RADIO THAT WE WEREN'T SUPPOSED TO HAVE DONE THAT. I SPOKE ON A PHONE WITH THE CTLR AFTER WE WENT IN, AND EXPLAINED WHAT I THOUGHT WE WERE CLRED AND APOLOGIZED FOR ANY MISUNDERSTANDING. THE CTLR SOUNDED PEEVED BUT ACCEPTED MY APOLOGY AND SAID HE WOULDN'T DO ANYTHING ABOUT IT THIS TIME, BUT WILL NEXT TIME. HE MAINTAINS HE HAD NOT CLRED US ACROSS, AND HE MAY BE RIGHT, WE WERE TIRED. MAJOR CONTRIBUTING FACTORS TO THIS INCIDENT: THIS IS AN OVERNIGHT OP WITH AN XA30 PM HOTEL PICKUP TIME, A FLT INTO A SORT WITH A WAIT OF 4+ HRS, FOLLOWED BY A FLT OUT. THIS IS FATIGUING EVEN FOR THOSE WHO THINK THEY ARE USED TO IT. THERE IS NO FACILITY AT ANY OF OUR SORTS TO GET ANY REAL REST (RECLINERS ONLY), SO THE FATIGUE REALLY IS THERE. THERE IS A PSYCHOLOGICAL TERM, WHICH ESCAPES ME RIGHT NOW, FOR THE MIND TAKING WHAT WAS HEARD AND TURNING INTO WHAT ONE EXPECTS OR WANTS TO HEAR. THAT MAY WELL HAVE HAPPENED TO ALL 3 OF US THIS MORNING. MIX WITH FATIGUE, AND THE COMBINATION CAN BE SCARY.

Synopsis :
A DC8 CREW, TAXIING TO RAMP AFTER LNDG AT TYS, TAXIED ACROSS AN ACTIVE RWY WITHOUT CLRNC.

Report #2

Narrative :
WE WERE GIVEN A VISUAL APCH TO RWY 23R AT TYS. AFTER THE FO MADE THE LNDG, THE TWR/GND CTLR TOLD US TO TURN L AT THE END OF THE RWY, TAXI BACK ON TXWY B, AND HOLD SHORT OF THE APCH END OF RWY 23R AT B8. AN AIRBORNE DC9 WAS LNDG ON RWY 23R WITH INSTRUCTIONS TO MAKE A 180 DEG TURN ON THE RWY AND BACK TAXI. AS WE TAXIED ON TXWY B AND COMPLETED THE AFTER LNDG CHKLIST, THE DC9 LANDED AND BEGAN TAXIING AS INSTRUCTED. WE REACHED THE APCH END OF RWY 23R AND CROSSED THE RWY AT B8 WHILE SEEING THE DC9 TURN OFF THE RWY AT G7. THE CTLR INFORMED US WE WERE NOT CLRED TO CROSS RWY 23R AND TOLD US TO CONTINUE TO THE RAMP. WITH THE UNDERSTANDING OF WHY WE WERE TOLD TO HOLD SHORT, WE EXPECTED TO GET THE CLRNC TO CROSS AND IN MY MIND I THOUGHT WE WERE CLRED. FATIGUE PLAYED A LARGE ROLE IN THIS INCIDENT. WE HAD XA30 PICK-UP TIME AT THE HOTEL. THEN THE FIRST LEG FROM KNOXVILLE TO LOUISVILLE FOLLOWED BY A 4 1/2+ HR WAIT WITHOUT PROPER REST FACILITIES (RECLINERS) IN SDF BEFORE THE RETURN TRIP TO TYS. EVEN THOSE WHO FLY THIS ALL THE TIME OR BELIEVE THEY ARE USED TO THIS 'BACK-SIDE-OF-THE-CLOCK' SCHEDULE, ARE NOT IMMUNE TO THE CUMULATIVE EFFECTS OF FATIGUE. BEING CONDITIONED FOR CERTAIN EVENTS, OR CLRNCS IN THIS CASE, TO OCCUR WAS ALSO A FACTOR. I REMEMBER HEARING ABOUT THIS DURING CRM TRAINING, BUT CAN'T RECALL THE TERM FOR IT. THIS IS A CASE OF WHERE FATIGUE COMBINED WITH ACTING UPON AN EXPECTED RESPONSE FROM ATC COULD HAVE RESULTED IN DISASTER.

Synopsis :
RWY INCURSION IN A CARGO DC8 DURING A NIGHT OP AT TYS, TN.

Report #3

Narrative :
WE WERE GIVEN AN INITIAL ALT AFTER TKOF OF 3000 FT MSL. AFTER TKOF FROM RWY 10, THE TWR CALLED TFC ENTERING A R DOWNWIND FOR RWY 10 WHICH WE CALLED IN SIGHT. WE WERE INSTRUCTED TO MAINTAIN VISUAL SEPARATION AND TURN R 250 DEGS. THE CAPT AND I DECIDED THE BEST METHOD OF SEPARATION WAS TO CLB AS QUICKLY AS POSSIBLE SINCE THE OTHER TFC WAS DSNDING INTO THE DOWNWIND. I WAS HAND FLYING THE ACFT AND WAS CLBING THE ACFT PRIMARILY ON VISUAL REFS TO MAINTAIN CONTACT WITH TFC. THE CAPT WAS PREOCCUPIED PERFORMING THE CLB CHKLIST WHEN I REALIZED WE WERE AT 3400 FT MSL. AS I PITCHED OVER TO GET BACK DOWN TO 3000 FT MSL, WE WERE GIVEN A CLB TO 6000 FT MSL. ATC MADE NO REF TO OUR ALT EXCURSION. I BELIEVE MY INATTN TO OUR ALT WAS CAUSED PRIMARILY BY MY FATIGUE THIS WAS THE THIRD DAY OF A 4-DAY TRIP AND THE FIFTH LEG OF 6 LEGS THAT DAY. THE PREVIOUS NIGHT I HAD SLEPT JUST UNDER 8 HRS AND THE NIGHT PRIOR TO THAT ONLY 6 HRS DUE TO SHORT OVERNIGHTS. THE DAY BEFORE THE INCIDENT I WAS ON DUTY 14 HRS AND THE DAY OF THE INCIDENT I HAD ALREADY BEEN ON DUTY 10 HRS. THE FAA SHOULD REWRITE THE REST RULES IN A WAY THAT PREVENTS FATIGUE FROM ACCUMULATING OVER THE DURATION IF MULTI-DAY TRIPS.

Synopsis :
AN AT72 CREW, DURING CLBOUT OF ST THOMAS (TIST), OVERSHOT THEIR ASSIGNED ALT.

For the full set of fifty reports see Note 3. ASRS Database Report Sets - Flight Crew Fatigue Reports FAR 121. (http://asrs.arc.nasa.gov/report_sets.htm). Aaa.

Appendix C. Perceptions of a Confidential Voluntary Reporting Program

Overview

Fifty-four engineers and conductors residing in the Midwestern United States completed a brief survey to determine perceptions of a confidential voluntary reporting program in the railroad industry. Prior to administering this survey, the concept of such a program was discussed with each individual and a one-page written summary was attached to each questionnaire.

Descriptive Statistics

To determine the degree to which engineers and conductors had an interest in testing a pilot program at their location, they were asked to express their interest using a scale ranging from 1 to 5, where "1 = To A Little or No Degree" and "5 = To a Very Great Degree". The mean response for this question was 2.65 suggesting that there was a "Moderate Degree" of interest in piloting a confidential reporting program at this location.

Participants were asked to rate the degree to which they would or would not use a confidential reporting system. Thirty-one respondents indicated that they *would* use such a system while 23 indicated that they *would not*. To determine the degree of trust and confidence in using such a system respondents were also asked to rate the degree to which they trusted or did not trust local management. As can be seen from the following table when the two groups (Trust vs Not Trust) were compared, there were some significant differences in terms of perceptions of the likely use of the system as well as perception of need, and acceptance. The high trust group was more likely to think such a system was needed, have an interest in testing such a system, think that such a system would be accepted, and lead to an increase in safety. Average acceptance ratings of the program increased from 1.8 to 2.3 if immunity was granted.

Comparisons were also made between education level, age of respondent and willingness to use a reporting program. Thirty-one respondents were under the age of 40, and of these individuals 41.9% indicated that they would use a reporting system. Twenty-three respondents were over the age of 40, and of these respondents 43.5% indicated that they would use such a system. No differences were found between respondents based on level of education.

Comparisons between the Engineer and Conductor crafts were also made. In particular, persons identifying themselves as Engineers were more likely to be interested in working with the FRA and the University of Denver to develop a reporting system and more likely to have an interest in receiving a report containing follow-up information after having made a report to the system. No differences were found between engineers and conductors on interest in using, reporting, or accepting the program. (See Appendix - Table 3).

Persons with a high degree of interest in testing such a system were slightly more interested in and apparently trusting of the University of Denver than in the FRA in developing the system. However, the differences were small and suggest that an independent third party is valued as a facilitator or contractor by those interested in testing such a system.

Comparison of Use and Acceptance Responses by Degree of Trust in Local Management

	TRST	N	Mean	Std. Deviation	Slg Level p<
Use such a system	Trust	24	3.4167	1.17646	.001
	Not Trust	30	2.0667	1.41259	
Reporting system needed	Trust	24	3.5833	1.13890	.001
	Not Trust	30	2.0667	1.25762	
Interest in testing a pilot program	Trust	24	3.7083	.99909	.001
	Not Trust	30	1.8000	1.12648	
Accepted by railroaders	Trust	24	2.9583	1.16018	.001
	Not Trust	30	1.8000	1.21485	
Accepted if immunity from discipline granted	Trust	24	3.6250	1.05552	.001
	Not Trust	30	2.3000	1.26355	
Report increase safety	Trust	24	3.4583	1.10253	.001
	Not Trust	30	2.0667	1.31131	

Comparison of High and Low interest in testing such a system

	Interest in Testing a Near Miss Pilot	N	Mean	Std. Deviation	Sig Level p<
Interest in working with DU to develop reporting system	Low	26	1.8462	1.22286	.000
	High	28	3.4643	.96156	
Interest in working with FRA to develop reporting system	Low	26	1.6154	1.06120	.000
	High	28	3.4286	1.16837	

Discussion

It appears that engineers and conductors are more likely to use a confidential reporting system if they trust local management and if they are 40 or older. Furthermore, statistical analyses revealed that participants would probably be more likely to accept a program if they trusted local management and work with a group that they have already developed some trust with in instituting a reporting system such as an independent University. A mean response of 3.3 (on a scale ranging from 1 to 5) to this question was obtained.

Comparison of Conduct vs Engineer Perceptions of Participation in Near Miss Reporting Pilot Project

	Craft	N	Mean	Std. Deviation	P<
Reporting system needed	Conductor	36	2.7222	1.40633	.893
	Engineer	18	2.7778	1.47750	
Use such a system	Conductor	36	2.4722	1.42400	.170
	Engineer	18	3.0556	1.51356	
Interest in testing a pilot program	Conductor	36	2.5278	1.44393	.387
	Engineer	18	2.8889	1.40958	
Report from home computer	Conductor	36	2.4722	1.55813	.851
	Engineer	18	2.5556	1.46417	
Report from depot computer	Conductor	36	1.8889	1.28236	.266
	Engineer	18	2.3333	1.53393	
Accepted by railroaders	Conductor	36	2.1667	1.32017	.245
	Engineer	18	2.6111	1.28973	
Accepted if immunity from discipline granted	Conductor	36	2.8333	1.23056	.671
	Engineer	18	3.0000	1.57181	
Report increase safety	Conductor	36	2.7500	1.40153	.635
	Engineer	18	2.5556	1.42343	
Interest in working with local management	Conductor	36	2.0556	1.32976	.101
	Engineer	18	2.7222	1.48742	
Local management approach reporting honestly	Conductor	36	2.0278	1.25325	.694
	Engineer	18	1.8889	1.13183	
Interest in working with FRA to develop reporting system	Conductor	36	2.2778	1.27864	.043
	Engineer	18	3.1111	1.60473	
FRA approach reporting honestly	Conductor	36	2.6944	1.32707	.382
	Engineer	18	3.0556	1.58938	
Interest in further training offered as a result of information reported	Conductor	36	2.8611	1.19888	.592
	Engineer	18	3.0556	1.34917	
Interest in receiving follow-up information regarding a report that YOU submitted	Conductor	36	2.2222	1.39614	.008
	Engineer	18	3.3889	1.57700	