Model Memorandum of Understanding

for

Participating Stakeholders

in

C^3RS (Confidential Close Call Reporting System) Demonstration Project

Final

March 30, 2005

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1. Purpose of the Model Memorandum of Understanding

The U.S. Federal Railroad Administration (FRA) and the railroad industry share an interest in improving railroad safety. As part of its mission, the FRA is sponsoring the Confidential Close Call Reporting System Demonstration Project (C^3RS Demonstration Project) to demonstrate the effectiveness of a confidential close call reporting system for the railroad industry. This close call reporting system will serve to both capture data that would otherwise not be captured as well as provide railroad carriers (carriers) and FRA with opportunities to identify safety issues that require corrective action.

This Model Memorandum of Understanding (MOU) describes the provisions of the C^3RS Demonstration Project and explains generally the rights, roles, and responsibilities of the participants under the project.

The purpose of this MOU is to gain full agreement from all parties to cooperate in the C^3RS Demonstration Project. Actual implementation of the project involving particular carriers and one or more of their labor organizations will be achieved through separate implementing memorandums of agreement (implementing MOUs) approved by FRA, as specified in section 12. The implementing MOUs will incorporate the various rights and responsibilities set out in this MOU, but will also contain additional provisions tailored to the needs of the participating parties, including how a carrier that is contemplating disciplinary or decertification action against one of its employees is notified that the employee is protected from such action under the implementing MOU.

2. Background

Over the last decade, the railroad industry achieved significant progress in improving the safety of railroad operations. Current railroad safety programs focus on collecting data primarily on reportable accidents. However, as the number of reportable events declines, accident data becomes less valuable in determining the sources of risk. Also, when safe outcomes do occur, there is nothing to capture the organization's attention: safety is invisible.

Nearly all transportation incidents are preceded by a chain of events or circumstances, any one of which might have prevented the accident if it had gone another way. In many cases, operators are aware of these "close calls", and may have information that could prevent future mishaps. For example, the National Transportation Board (NTSB) report of the Collision and Derailment of Maryland Rail Commuter MARC Train 286 and

National Railroad Passenger Corporation (Amtrak) train 29 Near Silver Spring, MD on February 16, 1996 cites several related close calls that preceded the crash[1].

Railroads can reduce risks before an accident by analyzing close calls. When individual close call events are analyzed collectively, railroads can identify safety hazards and develop solutions to these threats. Close call reports can also provide important safety information to FRA thereby enabling FRA to more effectively perform its oversight role.

Railroad employees, like employees in other industries, are often unwilling to report unobserved events that could result in adverse safety outcomes particularly with respect to self-reported behaviors, because disclosure may result in punishment for the employee. Confidential safety reporting systems address these problems of collecting information about close calls in a way that protects the identity of the employee.

2.1 Workshop: Improving Railroad Safety Through Understanding Close Calls

In April 2003, the FRA's Office of Research and Development held a Human Factors Workshop: *Improving Railroad Safety Through Understanding Close Calls* in Baltimore, MD. The purpose of the workshop was to educate the railroad industry on the benefits of understanding close call events and to provide a forum for participants to discuss issues and develop solutions.

The speakers represented several transportation modes and countries. Each described their close call best practices and the challenges faced during the implementation. Following the presentations, the workshop participants discussed the benefits and barriers to implementing a close call system for the railroad industry and discussed steps needed to develop close call systems within the U.S. railroads.

The meeting participants, representing a cross section of industry stakeholders, suggested that the FRA set up a demonstration project to test the viability of a close call reporting system for the railroad industry.

2.2 Close Call Planning Committee – Brief history and decision-making process

In June 2002 the FRA formed a Planning Committee (Committee), representing key stakeholders from industry, labor organizations, and government. The Committee's task was to decide how to introduce the railroad industry to the value of studying close calls as a way of improving safety.

Meeting frequently over the next 10 months, members designed a workshop to meet that objective. In order to accomplish this, they first needed to become experts themselves in

[1] For example, the report states that in 1995, "the Safety Board provided a survey form to the Brotherhood of Locomotive Engineers (BLE) and the UTU requesting a description of any unusual signal occurrences. A total of 95 complaints were received from both organizations dating from February 1993." (page 103); National Transportation Safety Board, Washington, DC 20594, Railroad Accident Report Collision and Derailment of Maryland Rail Commuter MARC Train 286 and National Railroad Passenger Corporation; AMTRAK Train 29; Near Silver Spring, Maryland on February 16, 1996; PB97-916302 NTSB/RAR-97/02

close call systems currently operating internationally and in other industries, and discuss possible benefits and concerns for the railroad industry.

Committee members requested a *White Paper: Improving Railroad Safety through Understanding Close Calls* to use to brief their organizations' management teams. They wanted it to address the following: the definition of a close call, safety benefits of analyzing close calls and lessons learned from organizations that already analyze close calls.

Committee members considered lessons learned from similar workshops they had attended. They then carefully planned the details of a Human Factors Workshop: *Improving Railroad Safety Through Understanding Close Calls*. They defined goals and the desired audience, developed the agenda, choose the speakers (from other industries and railroads that have benefited from studying close calls) who would appeal to their respective organizations, set up a web site, invited guests and designed the small discussion-group format to encourage open dialogue across stakeholder groups.

Members of the Committee also briefed their own organizations to encourage attendance and support at the Workshop, and each actually took on the role of change agent within that organization in order to champion this effort. Later, they analyzed the feedback on the workshop and determined the format and content of the workshop proceedings.

The Committee expected more resistance from workshop participants to using a close call system approach, and members were pleased at the number of participants expressing interest in moving forward. At the close of the workshop, the Committee recommended that the FRA initiate a close calls demonstration project and decided to continue meeting to plan the project. FRA subsequently agreed to sponsor the demonstration project and directed the Committee to come up with recommendations on how the project should be structured.

The Committee committed to continue to help the railroad industry move forward in studying close calls, and revised its role as guiding the demonstration project. Since the April 2003 workshop, the Committee has been holding meetings, having conference calls and exchanging emails with more frequency.

The Committee has always had surprisingly good attendance, and full and free participation of all members in discussions. Key members include three industry managers and three labor organization representatives; Bureau of Transportation Statistics (BTS), NTSB, FRA Office of Research and Development, FRA Office of Safety, and the Volpe National Transportation Center (Volpe Center) are represented as well. If for some reason a key party is not able to participate in an important decision, that decision is not final until their agreement is obtained.

The Committee makes decisions by consensus, which has meant that members continue to discuss an issue until they arrive at a decision that although it may not be everyone's ideal solution, is one everyone can support and advocate for in their organizations.

Recent discussions among Committee members and with FRA, leading to this MOU have included the following discussions, among many:

1. Definition of terms such as *close call;*

2. Studying other close call reporting system models in detail to define this model;
3. Planning the implementation;
4. Legal obstacles to the pilot, including options for relief of mandatory discipline and/or decertification;
5. Protection of employees who report close calls;
6. How to maintain confidentiality;
7. Protection of data;
8. Characteristics of successful pilots;
9. Pilot roles and responsibilities;
10. Criteria for selecting pilot sites;
11. Deciding if alerts can be included; and
12. Deciding if security close calls should be included.

3. Purpose of the C^{3}RS (Confidential Close Call Reporting System)

A confidential close call reporting system is not separate and apart from the existing railroad reporting systems. It provides another tool to identify and assess safety risks in railroad operations. Close call events represent an opportunity to identify and correct weaknesses in a railroad's safety system prior to an unsafe event. The system can also be used to monitor changes in safety over time and to uncover hidden unsafe conditions that were previously unreported.

For this demonstration project, close call reports should be collected to address the following four goals:

1. To monitor the frequency of known failure modes (existing risks to safety);
2. To learn about new failure modes (new risks to safety);
3. To maintain alertness to the risks inherent in railroad operations; and
4. To enable carriers, labor organizations and FRA to identify safety issues that require corrective action.

The C^{3}RS Demonstration Project should foster a voluntary, cooperative, non-punitive environment to communicate safety concerns. Through the analysis of close calls, the parties to implementing MOUs and FRA will receive information about factors that may contribute to unsafe events and the error recovery mechanisms that prevented an adverse consequence from occurring. The participating carriers can use this information to help them develop corrective actions to help reduce risks to safety. The close call reporting system should also track and assess the corrective actions taken in response to close call events to identify successful and unsuccessful actions. The program should help determine what factors (i.e., equipment design, training, operating practices, management practices) promote the elimination of errors and what factors promote recovery from

errors. FRA can use the information to perform its railroad safety oversight role, including disseminating important safety information to other carriers and developing safety and enforcement tools to address widespread safety problems.

3.1 Definition of "Close Call"

A ***close call*** is ***an opportunity to improve safety practices in a situation or incident that has a potential for more serious consequences***. It represents a situation in which an ongoing sequence of events was stopped from developing further, preventing the occurrence of potentially serious safety-related consequences. This might include the following examples.

1. Events that happen frequently, but have low consequences (e.g., lifting objects that put employees at risk for minor injuries, such as sprains);
2. Events that happen infrequently but have the potential for high consequences (e.g., a train in dark territory proceeds beyond its authority);
3. Events that are below the FRA reporting threshold (e.g., an event that causes an injury requiring first aid, such as a cut); and
4. Events that are above the FRA reporting threshold where the potential exists for a far greater accident (e.g., a slow speed collision with only minor damage to the equipment; note that under section 9.3, employees receive no protection from discipline and/or decertification for reports of accidents/incidents that meet FRA reporting criteria).

4. Scope of the C^{3}RS Demonstration Project

The C^{3}RS Demonstration Project applies to carriers and their employees who are included in written implementing MOUs that have been approved by the FRA in accordance with section 12.

It is expected that the demonstration project would need to be operational for several years before quantitative outcome measures in terms of injury and accident rates can be measured. Specifically, it will take at least three, and perhaps up to five years to finish the final summative evaluation. (See section 14 for a discussion of the duration of the project.)

5. C^{3}RS Demonstration Project Description

The FRA is sponsoring the C^{3}RS Demonstration Project to demonstrate the effectiveness of a confidential close call reporting system to improve railroad safety.[2]

The project is designed to perform six primary functions:

1. Accept reports of close calls that meet the criteria set forth in section 7.1;
2. Store confidential data;

[2] Safety is defined as free from risk -- anything that helps avoid injuries, fatalities or equipment damage.

3. Analyze close calls;
4. Disseminate reports on trends and other information for use by participating parties and FRA;
5. Track carriers' reports on their corrective actions to measure the system's impact on safety; and
6. Evaluate and identify ways to improve the effectiveness of the reporting system.

The system shall be a dynamic demonstration project. The project should identify the elements needed to foster a successful outcome and the project will be adjusted as needed to assure it continues to meet program objectives and the needs of the industry.

To provide confidentiality for individuals who report close calls, a third party is needed to accept, store, process, and analyze the reports, as well as to disseminate reports to the participants and FRA on trends and new risks. BTS has agreed to perform these functions and FRA will be entering into a separate memorandum of agreement with BTS under which funding for project administration will be provided to BTS. BTS will hire a contractor with expertise in railroad technology and operations. The contractor will receive additional training in the functioning of the close call system.

5.1 Key elements of the Close Call Reporting System

The close call reporting system adheres to the following key elements:

1. Focused on identifying impediments to railroad safety;
2. Voluntary;
3. Confidential; and
4. Provide participating employees with protection from discipline by the employer and decertification in specified reporting situations.

5.2 Key Stakeholders

The primary organizations that will be involved in the demonstration project are: FRA Human Factors R&D Program; FRA Office of Safety; BTS; the Volpe Center; the carriers; the labor organizations; and the Peer Review Team (PRT), an expert team comprised of the key stakeholder representatives from FRA, the carriers and representatives from relevant labor organizations.

5.3 Steps in the reporting process

Step	Responsible party
1. Identify an unsafe event or condition and initiate a close call report.	Employee(s)
2. Enter close call report in tracking system if it meets acceptance criteria.[3] a. Confirm eligibility (see section 7.1 criteria for close call report acceptance). b. Date stamp and assign number. c. Mail receipt to employee.	BTS/ Contractor
3. Interviewer calls employee(s) to collect additional details about close call event or unsafe condition. If it meets acceptance criteria, report receives final acceptance.	BTS/ Contractor
4. De-identify close call report.	BTS/ Contractor
5. Analyze individual close call report for preliminary root causes and error recovery mechanisms. Analyze multiple reports for emerging trends and new sources of risk. Produce a report based on the collected data.	BTS/ Contractor
6. Meet at regular intervals to: a. Analyze each close call report (after the identifying information has been removed) and root causes; b. Analyze summarized data from multiple reports; c. Identify new sources of emerging trends & new types of safety-critical risks; d. Assess the association between emerging patterns or trends in close calls, relate those to corrective actions to be taken by the carriers, and advise on implementation; e. Review and discuss a summary report comprised of the individual close call reports generated from the Close Call Reporting System, emerging trends, identified root causes and suggested corrective actions; f. Distribute report to participating railroads and FRA giving feedback on close calls, emerging trends and newly identified risks, which were provided by BTS to the PRT; and g. Review and discuss all reports prior to their distribution.	PRT
7. Review individual carriers' decisions on corrective actions.	Carrier
8. Provide BTS with information on decisions made with respect to corrective actions (see section 11).	Carrier
9. Track corrective actions taken in response to close call events.	PRT
10. Make feedback available to employee on corrective actions.	BTS/ Contractor
11. Draft quarterly report to summarize emerging trends and corrective actions; distribute to all participants and FRA and put on the BTS/Volpe Close Call web site.	BTS/ Contractor
12. Write an annual report describing the status of the project, any modifications made and lessons learned to date; describe emerging trends and recommended solutions; distribute and put on the BTS/Volpe Close Call web site.	BTS/ Contractor

[3] If initial report contains insufficient information to determine acceptance, report will receive provisional acceptance. Final eligibility will be determined when the interviewer obtains more information from the employee.

Reporting, tracking and corrective action monitoring systems all will be developed and improved over time.

6. Eligibility

The C^3RS demonstration project applies to carriers and their employees who are included in an implementing MOU, as provided in section 12. An individual railroad employee filing a close call report in accordance with section 7 must belong to a group and be performing in a role covered under an implementing MOU in order to receive protection from carrier discipline and/or decertification. If an employee of a carrier participating in the project is not covered under the carrier's implementing MOU, the employee may file a close call report and the information the employee reports will remain confidential, however, the reporting employee will not receive protection from carrier discipline and/or decertification, or FRA enforcement, as described in Section 9, nor will the carrier receive protection from FRA enforcement.

7. Reporting Procedures

When an employee of a carrier included in an implementing MOU observes a safety problem or experiences a close call event, he or she should note the problem or event and describe it in enough detail using the BTS close call reporting form so that it can be evaluated by BTS and the PRT. (All reports will be depersonalized by BTS before the PRT sees them.)

7.1 Criteria for close call report acceptance

Employees of carriers participating in the C^3RS demonstration project can report any safety concern that could lead to an unsafe event or condition on the carrier. Reports can be accepted for any condition or event that is perceived as potentially endangering employees, the public, equipment, or the environment. Any concern about one's own safety or someone else's safety at work can be reported. Each close call report must contain sufficiently detailed information about a safety event so that a third party can evaluate it. An interviewer may call the employee to obtain more information about the event; if in doubt, the interviewer will err on the side of accepting the report.

BTS will conduct the first screening and the PRT the second. The following types of reports will be rejected:

1. Reports unrelated to railroad safety;
2. Urgent real-time issues (e.g., a runaway train);
3. Personal grievances; and
4. Labor organization management grievances.

7.2 Close call report form

BTS will develop a close call report form that will request information about the date, time, location, contributing factors, actions taken, potential consequences, along with enough other information to fully describe the event or perceived safety problem. The employee should complete the report form and submit it by mail to the BTS in accordance with the instructions on the form. BTS will mail a receipt to the employee. All reports will be depersonalized by BTS before the PRT sees them.

BTS will provide paper copies of the report form to the carriers and labor organizations participating in the C^{3}RS Demonstration Project; participating carriers will post the form on the company's bulletin boards and make electronic copies available on the company's computers (non-interactive: for downloading only). Electronic copies of the form will also be available on the BTS/Volpe Close Call web site (non-interactive: for downloading only).

7.3 Time limit to file report and receive protection from carrier discipline and/or decertification and FRA enforcement

An employee must report an event within 48 hours after the occurrence of the event to receive protection from carrier discipline and/or decertification and FRA enforcement. If mail service is unavailable to the employee at the time he or she needs to file a close call report, the employee may file a close call report with BTS via telephone within 48 hours after the occurrence of the event. Reports filed by telephone within the prescribed time limit must be followed by a formal written close call report submission to BTS that is mailed within three calendar days after the phone call, provided that the report otherwise meets the acceptance criteria of this MOU.

8. Confidentiality

BTS shall act as the owner of the data reported to it by railroad employees under the C^{3}RS Demonstration Project, and protect the confidentiality of this information through its own governance and the Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA).[4]

After BTS has determined that all relevant data from a close call event has been collected, the close call report should be de-identified so that the employee's identity or anyone mentioned in the report can no longer be determined.

BTS shall protect the following information from disclosure when provided in a close call report:

1. The employee's close call report and the content of that report;
2. The name of the employee who submits a close call report;
3. The name of any other employees mentioned in the close call report, regardless of whether or not they are part of the pilot;

[4] By federal mandate, data collected by BTS is not subject to the Freedom of Information Act or third party litigation. Under CIPSEA raw data cannot be used for the development of regulations.

4. The name of the carrier involved in the close call report;
5. The exact location of a close call; description of specific, rarely used equipment models; or any other information that would make it obvious that only a few, easily-identifiable people could have made the close call report; and
6. Evidence and other information gathered during a PRT evaluation of a close call report

9. Protection from Carrier Discipline and/or decertification and FRA Enforcement

9.1 Background

Since the main purpose of this close call reporting system is for the railroad industry to learn more about the safety risks it faces, a central element is to shield employees from carrier discipline and/or decertification and FRA enforcement. A corollary to this concern is the need to also shield carriers from FRA enforcement potentially arising from events reported under this system.

Shielding people and carriers from blame creates an environment where employees and managers feel more comfortable disclosing information. Successful close call systems protect the identity of the person disclosing information, and use the information for learning about system problems and coaching employees. Reporting unsafe conditions and actions is fostered in an environment where the organization wants to learn why the system failed and focus on improving the "system".

9.2 Conditions that protect a reporting employee from carrier discipline and/or decertification and FRA enforcement

Except as provided below and in Section 9.3, carrier employees included in an implementing MOU, who report close calls in accordance with section 7, receive protection from discipline and/or decertification by their employing carrier, provided an appropriate FRA waiver has been granted. FRA will permit the carrier, while participating in the program, to not decertify the employee if the event, which otherwise meets the criteria for decertification under 49 CFR Part 240, also meets **all** of the following conditions. [5] Protection from company discipline and/or decertification requires that the same conditions apply:

1. The employee's action or lack of action was not intended to cause damage to the carrier's operations, equipment, or personnel; and
2. The employee reports the unsafe condition within the time limits set forth in section 7.3, and the report is accepted as provided in section 7.1.

An employee who violates a law, regulation or operating rule under a direct order from a supervisor is protected from discipline and/or decertification.

[5] As provided in section 12, carriers and their employees must seek and secure FRA approval of waivers of FRA rules (such as Part 240) when seeking approval of a demonstration project.

Employees that file an accepted close call report are protected from discipline and/or decertification by their employing carrier and FRA enforcement (i.e., an individual liability action) arising from the **retrospective** discovery of events involving violations of operating practices involving the event reported. This includes the **retrospective** (as opposed to real time) use or review of event recorder data.[6]

An employee who commits an act that would otherwise be covered but does not file a timely close call report is afforded the same protection outlined in this MOU provided an immediate co-worker timely files a close call report about the incident.[7] Carriers and the FRA are prohibited from using any information contained in an accepted close call report to pursue any disciplinary or enforcement action.

9.3 Conditions when a reporting employee is not protected from carrier discipline and/or decertification and FRA enforcement

Carrier employees included in an implementing MOU receive no protection from carrier discipline and/or decertification or from FRA enforcement action when **any** of the following conditions occur:

1. The employee's action or lack of action was **intended** to damage the carrier's operations or equipment, or injure other employees, or the employee's action or lack of action purposely places others in danger (i.e., sabotage)
2. The employee's action or lack of action involved a criminal offense;
3. The employee's behavior involved substance abuse or inappropriate use of controlled substances;
4. The close call report contains falsified information;
5. The event resulted in a railroad accident/incident that qualifies as reportable under 49 C.F.R. § 225.11;
6. The event resulted in an identifiable release of a hazardous material; or

[6] Using specific events or trends highlighted by the C^{3}RS reporting system to identify, target, decertify or discipline employees is outside the spirit of this project. "Event recorder" means a device, designed to resist tampering, that monitors and records data on train speed, direction of motion, time, distance, throttle position, brake applications and operations (including train brake, independent brake, and, if so equipped, dynamic brake applications and operations), and, where the locomotive is so equipped, cab signal aspect(s), over the most recent 48 hours of operation of the electrical system of the locomotive on which it is installed. See 49 C.F.R. § 229.5(g).

[7] Examples of "immediate co-workers" would be members of the same train crew or work group. The determination, however, is not to be based merely on proximity, but on functionality, as well. An engineer and a conductor in the cab of a locomotive would be immediate co-workers. A train crew conducting switching but being separated from each other by distance, cars, etc., so that they are only in radio contact (i.e., not visual contact) may be members of the same crew, but would almost certainly not be immediate co-workers the entire time they were switching cars.

7. The event was observed in real time and reported to the carrier (such as a dispatcher or operator observing a signal violation) or was observed as part of Operating Practices Testing.[8]

   Operating Practices Testing (e.g., efficiency testing, train control signal testing) are generally real time observations and do not qualify for exemption. Similarly, an employee is not exempt from carrier discipline and/or decertification for a violation that the carrier or FRA identifies contemporaneously (e.g., a block goes red and the dispatcher notices it before the train backs off the circuit) before the employee files a close call report; in such situations, a carrier or FRA may use event recorder information to support discipline and/or decertification. For example, a carrier official who observes a train operate past a signal that requires a stop may use any relevant data recorded by the locomotive's event recorder in pursuing disciplinary action against the train crew, regardless of whether a member of the crew timely files a close call report.

Other than what is stated above, there are no other changes to the carriers' disciplinary systems.

9.4 Conditions when a participating carrier is and is not protected from FRA enforcement action

FRA will also afford the same protection from enforcement action to a carrier covered by an implementing MOU for any incident for which an accepted close call report is filed regarding an employee of the carrier if that employee is protected from carrier discipline and/or decertification pursuant to the terms of this section. Likewise, if an employee report falls under one of the exceptions listed in Section 9.3 and the employee is not afforded protection, the carrier will also not receive protection from FRA enforcement action.

10. Use of Data

All participants in the C^{3}RS Demonstration Project agree to use the information they acquire for positive purposes to improve safety. This could include new or modified training, assessing risk and allocating resources to address those risks, and learning why these reported unsafe events are taking place. The carriers agree to refrain from using this data for the purpose of discovering who else might be engaged in the same activity, and disciplining and decertifying employees for that behavior.

11. Corrective Actions

Corrective actions are the actions taken by carriers in response to the PRT's reports of emerging trends and new types of safety-critical events.[9] Criteria for corrective action

[8] It might also include other real-time monitoring activities.

and corrective action reporting are: 1. It is not a burden to communicate; and 2. It is not intrusive to monitor.

12. Stakeholders' Responsibilities in Support of the MOU

The rights, roles, and responsibilities set forth in this MOU apply only to participants in the C^3RS Demonstration Project pursuant to implementing MOUs that have been approved by the FRA. If a demonstration project involves a waiver of any FRA rules, the parties shall submit a waiver request under 49 CFR § 211.41; in granting the waiver request, the FRA Railroad Safety Board may impose conditions necessary to assure safety.

There are five primary stakeholder organizations that will be involved in the demonstration project. These include: FRA Human Factors R&D Program, which will fund and sponsor the program for the industry; FRA Office of Safety, which will consult on the project's goals and implementation plan; BTS, which will collect and analyze the reporting data; the Volpe Center, which, on behalf of the FRA Human Factor's Program, will coordinate the demonstration project, conduct the program evaluation, and provide staff support to the project; the carriers, which will implement the reporting system on their respective railroad; and the labor organizations, which will represent the employees providing the close call reports.

12.1 FRA's responsibilities in support of the MOU

The FRA will oversee the scope and quality of the work. Experience gained from other modes has indicated that the willingness of persons to submit a close call report depends to a large degree on preserving the carrier's and the employee's confidentiality as well as that of persons named in those reports. Accordingly, FRA agrees to "stay at arm's length from the close call reports before the identifying information (see section 5.3) has been removed." FRA will not seek, and BTS will not release to FRA, any information that might reveal the identity of such persons or organizations mentioned in close call reports.

Specific FRA responsibilities include the following activities:

1. Fund the C^3RS Demonstration Project if Congress appropriates funds for the project. The duration of the project is dependent upon continued Congressional funding. As provided in section 14, any party may terminate their participation in the project at any time. The amount of advance notice that must be provided will be set forth in the implementing MOUs.
2. Approve the project plan, budget, and detailed implementation.

[9] For the reporting system to be successful corrective actions must be implemented or no improvement will occur. Since the close call reporting system is not directly concerned with the internal operations of any carrier, it will not be possible to demonstrate a direct causal link between specific close calls reported and corrective actions taken by the carriers. However, it may be possible to show an association between emerging patterns or trends in close calls and relate those to corrective actions taken by the carriers. It also may be able to evaluate whether carriers are following through on the number of corrective actions they agree to address.

3. Assign employees to work on the PRT to analyze and summarize emerging trends as well as to recommend corrective actions.
4. Monitor the evaluation of the project.
5. Consult on the project's organization, goals, objectives, elements, and high-level implementation plan, as one of the stakeholders on the Close Call Planning Committee.
6. Develop a model corrective action protocol, which is a communications system with a feedback loop between the carrier, BTS and the PRT.

12.2 Third party's responsibilities in support of the MOU

BTS and the Volpe Center are independent third parties. The third parties' responsibilities in support of the MOU are to manage the implementation of the close call reporting system and protect the confidentiality of the data. BTS will act as the owner of the data, and protect the confidentiality of this information through its own governance and CIPSEA.

Other tasks include the following:

Project planning -- BTS and the Volpe Center

1. Design the project's organization structure; goals, objectives, elements; project plan; draft of budget; high-level implementation plan; detailed implementation plan; and oversight and management of demonstration program.
2. Identify and prepare demonstration sites, including training applicable employees and managers, and integration with other related efforts.
3. Provide a system for the railroad employees to report close calls, confidentially, including processes and procedures for data collection, and analysis and interpretation of reports.
4. Provide a process for rigorous quality assurance of data input, output, content, and timeliness.
5. Manage the BTS/Volpe Close Call website.

Manage reporting system -- BTS and the Volpe Center

1. Enter close call report in the tracking system if it meets acceptance criteria.
    - Confirm eligibility (see section 7.1).
    - Date stamp and assign number.
    - Mail a receipt to the employee.
2. Interviewer calls the employee(s) to collect additional details about close call event or unsafe condition. If it meets acceptance criteria, report receives final acceptance.
3. De-identify close call report.

4. Analyze individual close call report for preliminary root causes and error recovery mechanisms. Analyze multiple reports for emerging trends and new sources of risk. Produce a report based on the collected data.
5. Send report to participating carrier(s) and to FRA about emerging trends and new risks.
6. Make feedback available to employee on corrective actions.
7. Draft quarterly report to summarize emerging trends and corrective actions. Distribute to all participants in the C^{3}RS Demonstration Project, including FRA, and put on BTS/Volpe Close Call web site.
8. Write an annual report describing the status of the C^{3}RS Demonstration Project, any modifications made and lessons learned to date; describe emerging trends and recommended solutions; distribute to all participants in the C^{3}RS Demonstration Project, including FRA; and put on BTS/Volpe Close Call web site.

Program evaluation - Volpe Center

The success of the C^{3}RS Demonstration Project depends upon its implementation and how it impacts safety at each of the participating railroads. A program evaluation will be conducted in a way to facilitate the smooth implementation of the project and measure the project's effectiveness in improving safety with a minimal burden to the participating railroads. The Volpe Center will conduct the program evaluation component of this project with support from a third party. The following tasks related to program evaluation will be performed:

1. Collect baseline measures of safety and reporting culture for each participating railroad.
2. Measure performance by tracking safety measures against the baseline to see if risk has been reduced.
3. Provide feedback to participants to improve the implementation of close call demonstration project.
4. Write baseline report, mid-term report, and final report.

12.3 Carrier's responsibilities in support of the MOU

Carriers participating in the C^{3}RS Demonstration Project have the following responsibilities:

1. Commit to the use of this reporting system at all levels of the organization.
2. Consult on the high-level implementation plan.
3. A carrier representative should participate on the PRT to analyze and summarize emerging trends as well as to recommend corrective actions.
4. Senior management and supervisors cannot preempt their respective representative's decision-making discretion for an event reported.

5. The carrier should "stay at arm's length from close call report data before the identifying information has been removed (see section 5.3)." The carrier should not seek any information that might reveal the identity of employees or individuals mentioned in a close call report.
6. The carrier will use the information collected from the close call demonstration project for the purpose of improving safety. The carrier agrees not to use the information for the purpose of disciplining or decertifying employees.
7. Using the reports, the carriers then will take corrective action. Since they have the most detailed knowledge of the situation, it is their responsibility to determine the specific action to be taken and monitor the effectiveness.
8. Take corrective action in a timely manner.
9. Review their decisions on corrective actions. Report corrective actions taken to the BTS or report why no action was taken.
10. As an important means to achieve success in this demonstration program, carriers are encouraged to develop a communication plan for sharing findings with their employees.
11. Report on the measured effectiveness of corrective actions to the BTS.

12.4 Labor organization's responsibilities in support of the MOU

Labor organizations participating in the C^3RS Demonstration Project have the following responsibilities:

1. Commit to the use of the close call reporting system at all levels of the organization.
2. Consult on the high-level implementation plan.
3. Representatives from each participating labor organization should participate on the PRT to analyze and summarize emerging trends as well as to recommend corrective actions.

12.5 Peer Review Team's responsibilities in support of the MOU

The PRT consists of individuals from the primary stakeholders (carriers, labor organizations, and FRA) to represent their employer's perspectives in forming a comprehensive view of close call events. The PRT will be composed of two representatives from each of the following stakeholder groups: carrier management, the affected labor organizations, and FRA.[10] One representative from BTS will participate. During the startup period of the demonstration program (perhaps the first six months) the PRT will utilize the membership of the Planning Committee for initial guidance and direction. Following the startup period, the PRT will draw members from the local level of the primary stakeholders. Continuity of the PRT membership is essential for success.

[10] This information is given for guidance only. Additional representatives may be added on a case-by-case basis to provide needed expertise.

The PRT will meet at a minimum on a quarterly basis. Their primary responsibilities include the following:

Analyze each individual close call report after the identifying information has been removed

1. Analyze each close call report after the identifying information has been removed (see section 5.3), and validate the root causes of the reported incidents.
2. Generate and distribute feedback reports to participating railroads giving feedback on close calls, emerging trends and newly identified risks, which were provided by BTS to the PRT.
3. For the participating railroads, assess the association between emerging patterns or trends in close calls, relate those to corrective actions to be taken by the carriers, and advise on implementation.
4. Assess the carrier's proposed corrective actions.
5. Track the carrier's follow through on the implementation of corrective actions.
6. Track the effectiveness of a carrier's implemented corrective actions and their impact on a demonstration site's safety.

Analyze collective reports

1. Analyze data from multiple reports.
2. Identify emerging trends & new types of safety-critical events within and across the demonstration sites.
3. Propose industry-wide corrective actions to address new sources of risk and emerging trends.
4. Review and discuss a summary report comprised of the individual close call reports, emerging trends, identified root causes and suggested corrective actions. Assess the association between emerging patterns or trends in close calls and relate those to corrective actions taken by the carriers.
5. Give input into a trend analysis report that analyzes the individual reports, emerging trends, identified root causes and suggested corrective actions.
6. Review and discuss all reports prior to their distribution.

The PRT will function using, but not be limited to, the following guidelines:

1. The team can conduct business only when a quorum is present. A quorum exists when all designated representatives, or their alternates, are present. The designated representative will name an alternate to act when the designated representative is unable to attend.

2. The primary stakeholders on the PRT are encouraged to consult with their constituents and additional FRA or industry experts for guidance on complex or sensitive matters, where more information is desired to make an informed decision.
3. The PRT will conduct its own root cause analysis, driven by the risk data (and a preliminary root cause analysis) provided by BTS.
4. Each representative is empowered to offer possible sources of risk, error recovery mechanisms, and corrective actions. Diverse perspectives are expected and encouraged. The PRT's opinions reflect a collaborative decision-making process among all PRT representatives.
5. The PRT makes its decisions using "consensus" when assigning root causes and proposing corrective actions. Consensus means the voluntary agreement of all representatives. It does not require that all members believe that a particular decision is the best one. Instead, all representatives' positions are given a proper hearing and are addressed, and a decision is one that all can accept.
6. The team will protect the confidentiality of the reporting employee, any employee mentioned in the close call report and the carrier for any report they review. The team will not disclose any information that would make it possible to identify the reporting employee(s) mentioned in the close call report, or the carrier.
7. The PRT will meet in a mutually convenient central location.

13. Modifications

Modifications to this MOU may be proposed at any time during the period of performance by any party to the MOU, and shall become effective upon written approval by all parties.

14. Project Duration

This MOU is in effect for five (5) years from the date of execution, and may be renewed by written agreement of the participants. Participants in the project may terminate their participation in the project; the amount of advance written notice they must provide will be set forth in the implementing MOUs.

The termination or modification of this agreement or an implementing MOU should not adversely affect anyone who acted in reliance on the terms of an implementing MOU in effect at the time of that action; i.e., when a particular project is terminated, all reports and investigations that were in progress should be handled under the provisions of the program until they are completed. Failure of any party to follow the terms of the implementing MOU ordinarily should result in termination of the implementing MOU. In addition, as described in Section 12.3, failure of a carrier to follow through with corrective action acceptable to the PRT to resolve any safety deficiencies that have been identified under the project within a reasonable time frame ordinarily should result in termination of the carrier's implementing MOU and, if necessary, the subsequent

development of safety and enforcement tools by FRA in its railroad safety oversight role, as noted in Section 3.

This is a demonstration program. If the program is determined to be successful after a comprehensive review and evaluation, the parties intend that it will be the basis for a continuing program, although not necessarily funded by FRA.

15. Record Keeping

All records and documents relating to this program should be appropriately kept in a manner that ensures compliance with applicable BTS and CIPSEA regulations.

16. Funding

Continuation of work under the C^3RS Demonstration Project is contingent on the future availability of FRA funds.

17. Responsible Officials

The officials responsible for this MOU are the FRA Acting Administrator, the BTS Director and the Carrier Chief Operating Officer (COO).

When top leadership changes in any of the participating organizations, it is expected that out-going managers should ensure that their successors understand the value of this program. Incoming leaders would need to co-sign this document to agree to its intent. Responsible officials, including the FRA Acting Administrator, the BTS Director, and the carrier's COO, will each sign the implementing MOU.

18. Planning Committee Signatures

The parties signing below participated in the development of this MOU and support the concepts of close call reporting. Execution of this Model MOU does not constitute a commitment by any party hereto to participate in the C^{3}RS Demonstration Project unless and until that party enters into an Implementing MOU with another party on mutually agreeable terms:

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19. FRA Statement of Support

The FRA supports the goals and principles contained in this model MOU.

Robert D. Jamison
Acting Administrator
U.S. Federal Railroad Administration (FRA)

3/30/05
Date

Appendix A: White Paper: Improving Railroad Safety through Understanding Close Calls

Improving Railroad Safety through Understanding Close Calls

Summary

Railroads can reduce risk before an accident by systematically studying close calls. Analyzing close calls is a proactive way to manage safety. A close call is "an opportunity to improve safety practices in a situation or incident that has a potential for more serious consequences." When individual events are analyzed collectively, railroads can identify safety hazards and develop solutions to these threats.

The development of successful close call systems share several common features that involve building trust to encourage disclosure of close call information. These features include using a third party to collect and store the information, confidential reporting, and limited protection for sources from liability or enforcement.

The Federal Railroad Administration's Office of Research and Development is sponsoring a workshop for the railroad industry to learn more about the safety benefits of studying close calls. The workshop will also provide a forum for participants to discuss issues and build trust.

Introduction

Accidents may be preceded by 'close calls' that warn us of a safety problem.

During the last 23 years, the Concorde jet suffered a series of tire blowouts on the landing gear. The blowouts ruptured fuel tanks, damaged hydraulic lines, electrical wires, and engines. Except for the damage to the aircraft, there were no fatalities.

On July 26, 2000, an Air France Concorde jet blew a tire, rupturing a fuel tank and catching fire. The plane crashed shortly after takeoff killing 109 passengers and crew.

A tragic accident like the Concorde may be preceded by several close calls similar to the accident, that do not result in catastrophe or harm to people, equipment, or the environment. These close call events provide an opportunity to proactively manage safety. Instead of waiting for an accident to occur, these events provide valuable information on which the railroad can act to reduce risk.

Railroads can target the greatest risks to safety.

Over the last decade, the railroad industry achieved significant progress in improving the safety of railroad operations. However, as the number of reportable events declines, additional reductions become more difficult to obtain. When the number of reportable accidents decreases, accident data becomes less valuable in determining the sources of risk. Also, when safe outcomes do occur, there is nothing to capture the organization's attention: safety is invisible[1].

Railroads maximize safety by addressing areas that pose the greatest safety risk. Close calls can provide information to monitor risk and manage safety.

Other modes and industries successfully use close call information to manage safety.

The aviation industry uses close calls as part of its safety management process. In the United States, the aviation industry created the Aviation Safety Reporting System (ASRS) and the Global Aviation Information Network (GAIN). The success of these industry-wide systems led to the

creation of company-specific systems for evaluating close calls. The analysis of close calls within airlines enables them to identify safety concerns specific to their organization.

ScotRail, a passenger railroad in Scotland, created the Confidential Incident Reporting and Analysis System (CIRAS). After a trial period, other railroads in the United Kingdom adopted this system to improve their safety management processes.

Evaluating close calls is also part of the safety management process in other industries like the chemical process and nuclear power industries. In those industries the probability of an accident is relatively low, but the adverse consequences are high.

This paper discusses the safety benefits of analyzing close calls and the lessons learned by organizations that successfully use those events as part of their safety management process.

What Is a Close Call?

A commonly used definition of a "close call" refers to an event that *could have* resulted in personal injury, property damage, or environmental damage, *but did not*. However, this definition is too narrow. For example, events that cause injuries, or property damage, but do not reach the threshold for reporting can still provide information about system safety. When these events are used to evaluate system safety, they signal a weakness that, if left alone, could result in more serious consequences. Small accidents may be predictive of larger accidents to come.

Instead, the following definition is proposed:

> *An opportunity to improve safety practices based on a condition or incident with a potential for more serious consequences.*[2]

This definition ties close calls to the safety management process. It highlights the opportunity to reduce risk by understanding the factors that lead to an unsafe event.

Decide on a threshold for what events count as close calls.

Using this definition, a threshold must be set to decide what events count as close calls. This definition could be used broadly to include many cases, or narrowly to include only a few cases. Potential cases include:

- Events that happen frequently, but have low consequences (e.g., lifting objects that put employees at risk for minor injuries such as sprains)
- Events that happen infrequently but have the potential for

high consequences (e.g., a train that proceeds past a red signal without proper authority)

- Events that cause an accident that is below the Federal Railroad Administration's (FRA) reporting threshold (e.g., an event that causes an injury requiring first aid, such as a cut)
- Events that are above the FRA threshold where the potential exists for a far greater accident (e.g., a slow speed collision with only minor damage to the equipment)

Ultimately, what events are considered close calls depend on how these events are used in the safety management process.

Safety Benefits of Analyzing Close Calls

The benefits of using close calls lay in how they are systematically used in the safety management process. A safety system is the combination of procedures, equipment, training, etc. used to manage safety. Close calls represent an opportunity to identify and correct weaknesses in the railroad's safety system prior to an unsafe event.

After implementing changes in safety, managers can use close calls to monitor the effectiveness of these changes in railroad operations over time. Safety managers and labor organizations can use information gathered from close call events in ways that range from reactive to proactive.

Reactive Approach

Reactively analyzing close calls identifies why unsafe events occur *after* safety has been compromised.

In a reactive approach, close calls are analyzed like reportable accidents to understand the contributing factors. Analyzing individual events makes it possible to identify where safety is compromised and develop solutions to these threats.

Recommendations made by the Switching Operations and Fatality Analysis (SOFA) working group illustrate how the analysis of accident and injury data can improve safety[3]. The SOFA working group analyzed fatalities and injuries in switching operations and identified several contributing factors. Based upon this analysis, the group proposed five safety recommendations to the railroad industry.

Proactive Approach

Proactively analyzing close calls looks at several cases to find trends or patterns *before* safety is compromised.

In a proactive approach, close calls and reportable accidents are collectively analyzed to identify trends or patterns related to failures or weaknesses in the safety system.[4] As the number of *reportable* events, like accidents have declined, the predictive value of this information has decreased, since there are fewer outcomes to suggest trends.[5] Close calls provide

additional information to guide decisions related to safety management.

Also, proactively using close call information in safety management focuses attention on the future, so that the past does not repeat itself.[2] There are many benefits to using close call events proactively.

Close calls can show where current weaknesses exist in the safety system. Close calls occur more frequently than reportable events, like accidents. Therefore, monitoring close calls can identify trends where protection is missing or could be improved, prior to an accident.

For example, a train collision took place in 1999 at Paddington in the United Kingdom, when the locomotive engineer passed a red signal. Following the accident, investigators discovered that the red signal at this location had been violated on eight previous occasions due to problems with the signal system.

Close calls can be used to monitor changes in safety over time. The higher frequency of events increases the sensitivity for detecting new failures as well as existing ones. Thus, the railroad can adapt to the conditions that change gradually over time as well as unexpected events.

Monitoring close calls can uncover hidden conditions previously not exposed by looking at reportable accidents alone. Hidden conditions such as design defects, gaps in supervision, unworkable procedures, and inadequate training may be present for years before they combine with local circumstances to result in an accident. Where observable failures may be unique to an event, hidden conditions are more likely to be consistent across a range of events. Close calls can identify patterns over time and across facilities.

Who Benefits from Analyzing Close Calls

Everyone benefits from using close calls to control safety.

When close call events are analyzed, everyone benefits:

- An effective program for collecting information about close call events shifts safety awareness to individuals at all levels of the organization. Safety becomes a concern for everyone.
- All groups see economic benefits in reducing costs associated with reductions in time lost from injuries, damage to railroad property, damage to the environment, and time required to move the customer's goods. Productivity improves when the railroads can more effectively schedule train and maintenance operations.

Lessons Learned from Organizations that Analyze Close Calls

Organizations that successfully analyze close calls share information well. They:

- Encourage disclosure by building and maintaining trust between the railroad parties;
- Engage front-line staff in the design of the system to build the trust necessary to foster disclosure;
- Structure the system so that information can be easily organized and analyzed;
- Provide continuous feedback to people at all levels of the railroad.

Encourage Disclosure by Building and Maintaining Trust

Features that encourage the disclosure of close call events include: using a third party to collect and store the information, screening close calls for inclusion, confidential reporting, and limited protection for sources from liability or enforcement.[6]

Third parties are neutral organizations that collect and store the close calls. In addition to collecting the information, they can check the information for accuracy, appropriateness, and completeness. With CIRAS, the reporting system developed by ScotRail in the United Kingdom, individuals provide information about a close call by mail or telephone to an independent third party. After receiving the initial report, the source may receive a call from the third party to acquire more detailed technical, environmental, and personal information and to verify the accuracy of the information.

It is important that only appropriate information is entered into the system. Does the event meet the definition of a close call? When a close call is reported, someone must determine whether it should be included in the system. One positive way of filtering close calls is to include the stakeholders in the decision. For example, in the GAIN system, two representatives, one from the FAA and one from a labor organization decide whether to include the information in the system, a ‘team approach’ to handling close call events that provides mutual protection.

Assuring confidentiality makes individuals more comfortable disclosing information.

Confidentiality in reporting encourages individuals to feel more comfortable disclosing close call information. CIRAS removes identifiers (e.g., name, location) and the information is stored in a database, to protect the identity of the individual reporting the information. The original forms are returned to

the individual and no copies are made.

Limited protection from liability and enforcement allows freer information exchanges.

Protecting people and organizations from liability and enforcement creates an environment where employees and managers feel comfortable disclosing information. Successful close call systems, like the ASRS database also protect the person disclosing information from disciplinary action. However, this protection does not provide immunity from all unsafe behavior. Behavior that willfully or recklessly places others in danger (i.e. sabotage or substance abuse) must be dealt with responsibly.

Drawing the line between acceptable and unacceptable behavior and communicating that information throughout the organization poses a significant challenge to the successful use of close calls.

Engage Front-line Staff in the Design of the System

Successful implementation of a close call system requires acceptance by a broad segment of the railroad community. The best way to achieve this is to involve users from all stakeholder groups in the system's definition and design.

Structure Systems to Organize and Analyze Information

To facilitate the analysis of close calls, effective systems are structured to easily obtain information for an accident model of how the system should work. In CIRAS, information is grouped in terms of human factors and plant/technical failures. The model addresses factors at both the individual and organizational level. This includes errors made by the front-line staff such as detection failures and application of the wrong rule. It also includes errors associated with management such as resource allocation, staffing, procedural failures, and equipment design.

Provide Feedback to All Levels of the Organization

Sharing information with individuals at other locations sensitizes them to the potential hazards. Successful safety management systems that use close call events provide feedback at all levels of the organization. There are several advantages.

Feedback from close call systems enables people to track the threats to safety and weaknesses of the system over time. The railroad industry can better adapt to emerging threats to system safety as conditions change. Several close call systems (CIRAS and ASRS) produce reports for the industry that

describe trends or patterns across an organization.

Feedback, however, must be used properly to manage safety. While it is helpful to measure the effectiveness of a solution in resolving a problem using close calls, it is counterproductive to set a goal of simply reducing the total number of close calls. One nuclear power plant that set goal of reducing the total number of disclosed close calls achieved a 50% reduction in disclosures in the first month followed by a greater reduction in subsequent months.[7] However, none of this had impact on the actual occurrence of the problem.

Feedback allows people to monitor the success of specific solutions. It is important to determine the degree to which a solution corrected a failure.

Timely feedback from the system can be given to the person who reported the close call. Giving timely feedback after someone discloses a close call shows that the information is valued and encourages continued disclosure.

Next Steps

Successful implementation of a close call system requires acceptance by a broad segment of the railroad community. Creating acceptance requires a dialog about how close calls will be used to build trust among the stakeholders. Any discussion will need to involve the participation of all stakeholders. While some members of the railroad community are familiar with the use of close calls, many others are not.

Learn more about using close calls and discuss issues at a workshop.

The Federal Railroad Administration's Office of Research and Development is sponsoring a workshop for railroad industry to learn more about the benefits of using close calls to manage safety within a railroad. Several speakers will:

- Share how their organization or industry uses close calls to manage safety
- Identify challenges to the development and use of close calls, and discuss solutions to those challenges

Then the workshop will provide an opportunity for participants to raise issues that concern the railroad industry and propose solutions.

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

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.

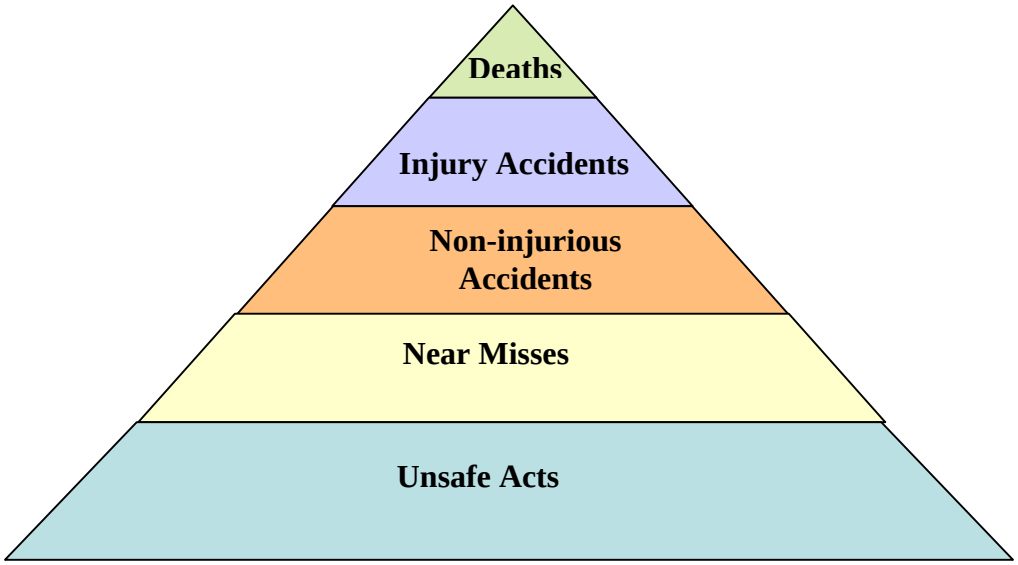

Figure 2. Reportable Accidents and Casualties.

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.

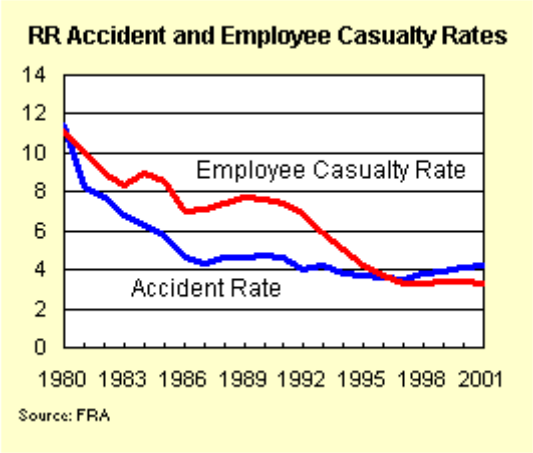

Figure 3. Reportable Accidents and Casualties.

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.

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).

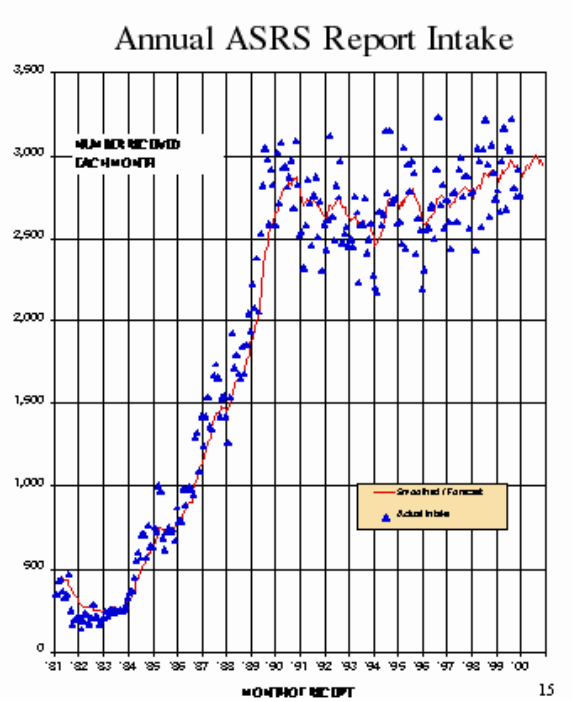

Figure 4. ASRS Report Frequency

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 REPORTS 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.

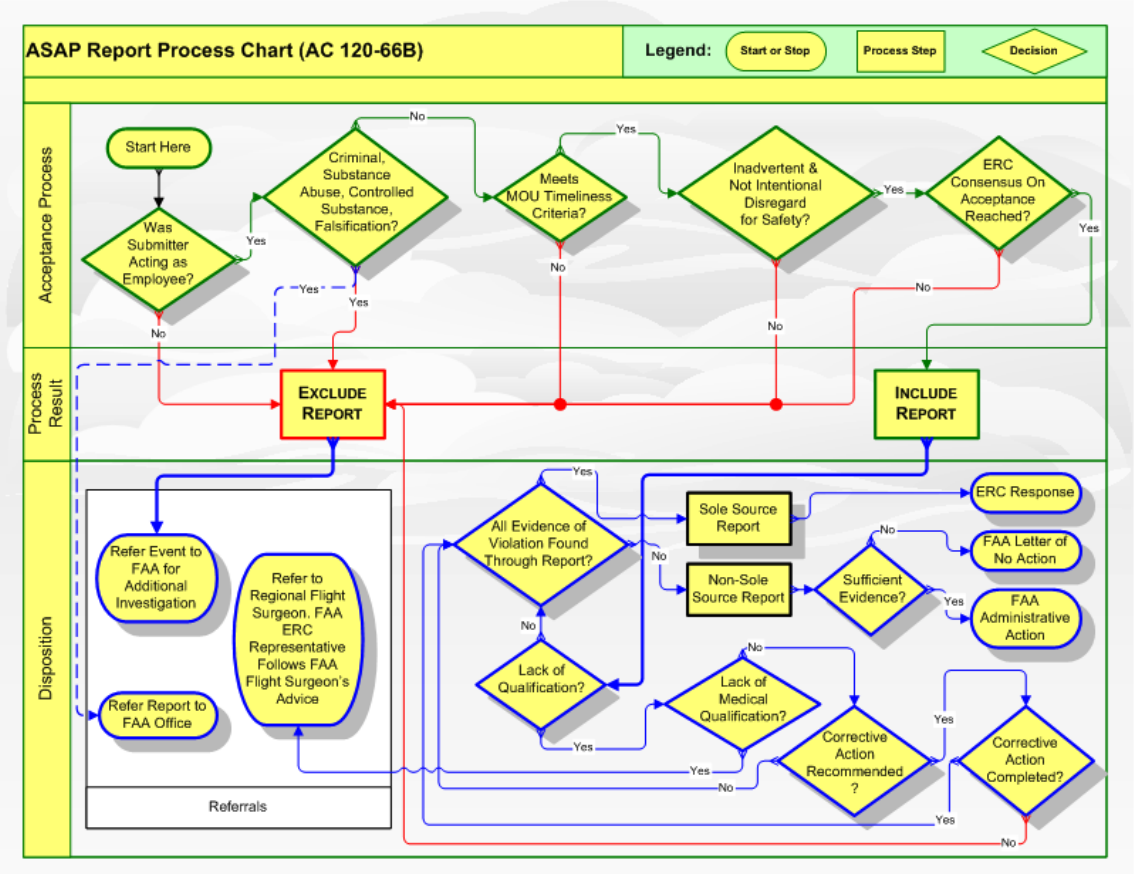

Figure 6. Flowchart of ASAP process.

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.

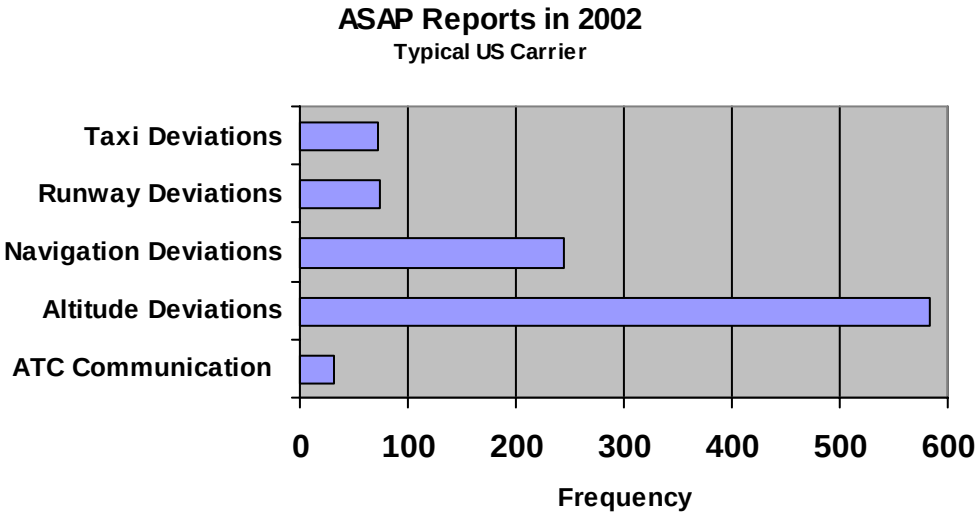

Figure 7. ASAP Reports for typical US Carrier.

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).

19.1.1.1 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:

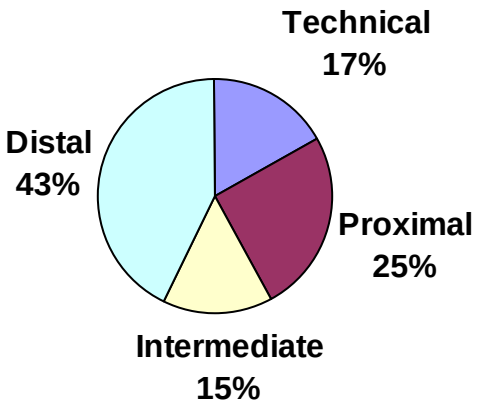

Figure 8. Types of Incidents Coded in CIRAS

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.

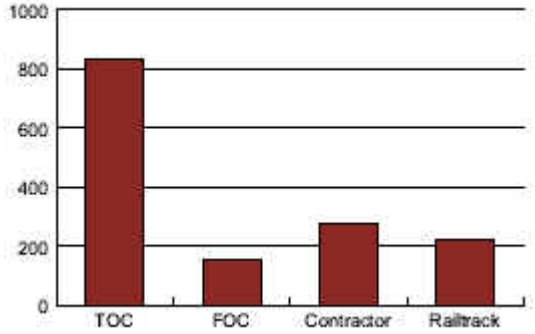

Figure 9. Sources of CIRAS reports.

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

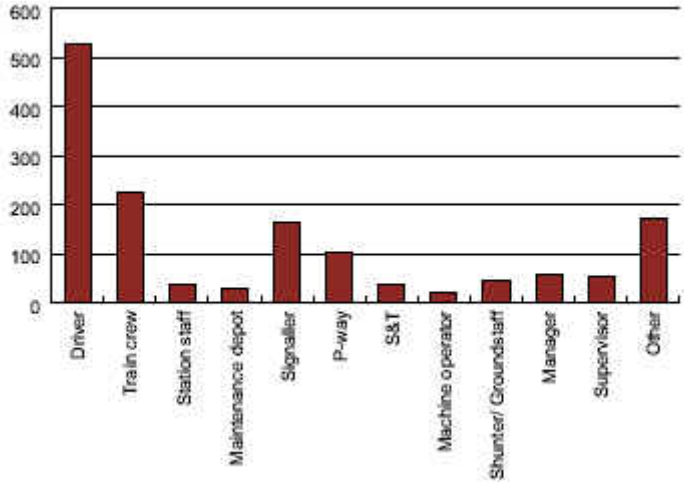

Figure 10. CIRAS reports by job category.

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.

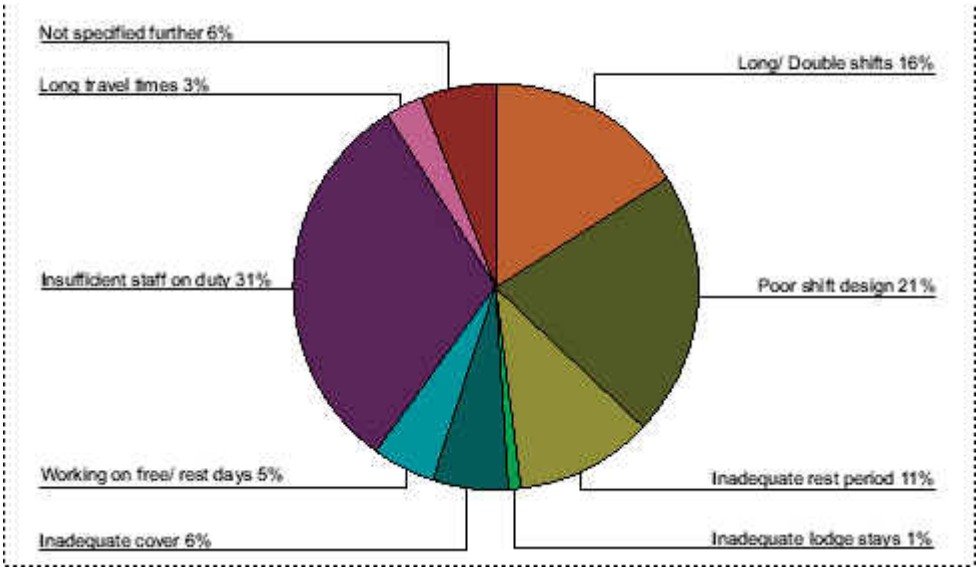

Figure 11. Types of concerns reported to CIRAS about work rest issues.

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.

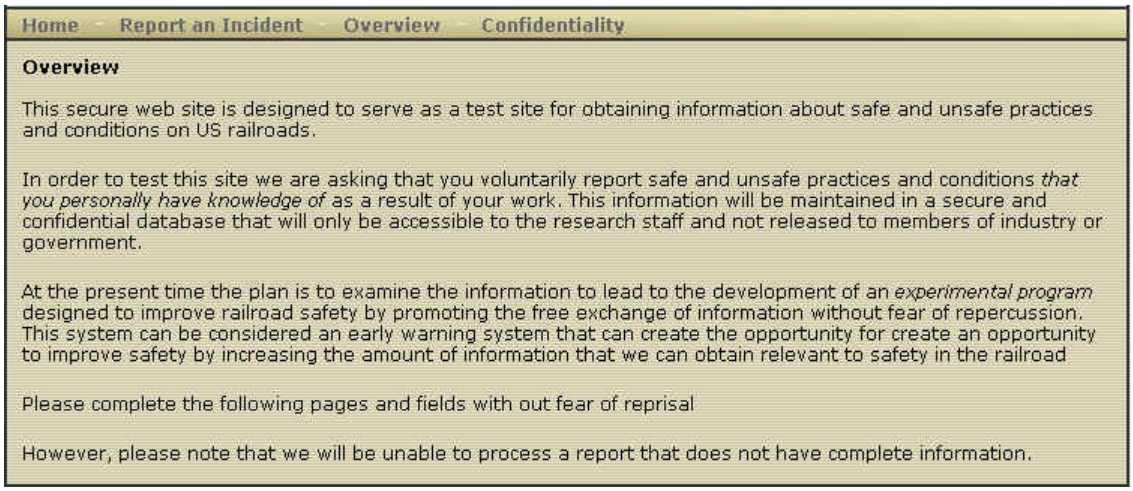

Figure 12. Pilot web page overview.

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.

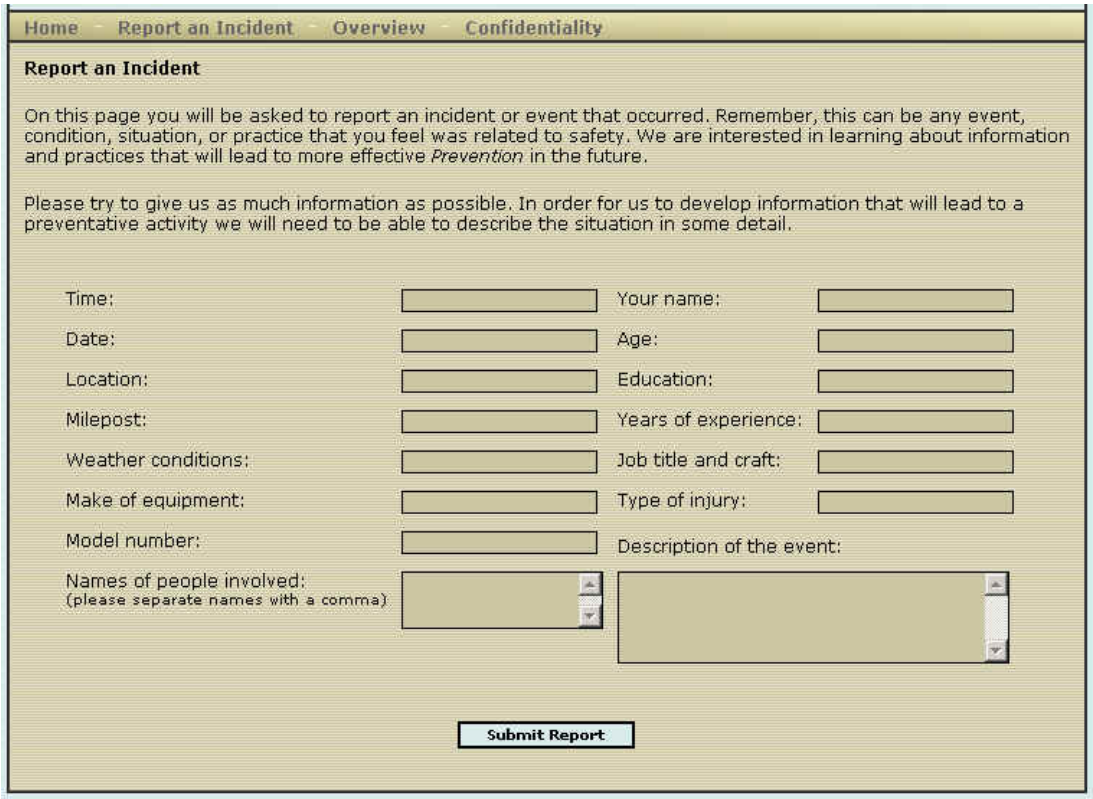

Figure 13. Web Form for Incident Reporting

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.

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Griffith, K. Scott, and Marx, K. (1998). Viewpoint: To improve air safety, focus on incidents, not accidents. *Aviation Week and Space Technology*, July 13, 1998.

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 underASAP 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	

[1]Weick, K. (1991). Organizational culture as a source of high reliability. *California Management Review*. 29: 112-127.

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