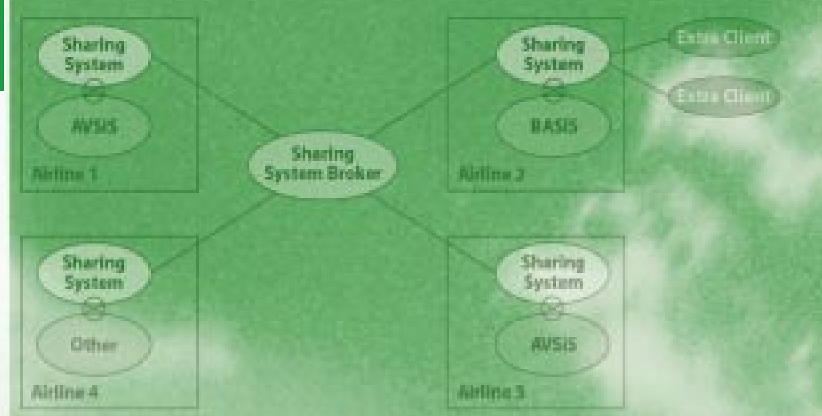
GUIDE TO

AUTOMATED AIRLINE SAFETY INFORMATION SHARING SYSTEMS



June 2003

029402.qxd

THIS PAGE LEFT BLANK

Guide to

AUTOMATED AIRLINE SAFETY INFORMATION SHARING SYSTEMS

Prepared by: GAIN Working Group C, Global Information Sharing Systems

June 2003

DISCLAIMER

RESTRICTION OF LIABILITY

Unless otherwise specifically stated, the information contained within this guide is made available by the Global Aviation Information Network (GAIN) for information purposes only. Neither GAIN nor any of its participants or entities thereof, assumes any legal liability or responsibility for the guide's accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed, or represents that the use of any information would not infringe privately owned rights. Reference within this guide to any specific commercial product, process, service by trade name, trademark, manufacturer, individual or otherwise, does not constitute or imply its endorsement, recommendation, or favoring by GAIN or any entities thereof. Any views, analysis and opinions expressed are under the sole responsibility of their authors.

Table of Contents

Table of Contents
(continued)

Page

Foreword

This guide on airline information sharing systems is the first in a planned series issued by the Global Aviation Information Network (GAIN) Working Group C. As an effort to increase the awareness of information sharing systems in the aviation community, Working Group (WG) C has begun to identify and document information sharing systems to support the major segments of aviation operations, focusing on airline flight safety. The reader should view this guide as a living document that will be updated periodically with improved coverage of information sharing systems developments.

This guide is not a comprehensive inventory of information sharing systems. Rather, the intent of the WG in this first issue is to highlight some sharing systems and information sharing concepts that may be useful to the airline industry. The group would like to receive feedback from the aviation community on their experience with information sharing systems. Suggestions on information sharing systems are welcome.

THIS PAGE LEFT BLANK

Acknowledgements

The following GAIN WG C members were primarily responsible for the preparation of this guide to Aviation Safety Sharing Systems:

Robert Aubé, xwave
Tom Curran, Aer Lingus
Tim Fuller, AvSoft U.K.
Michael Goodfellow, International Air Transport Association
Geoff Gosling, Independent Consultant
Andy Muir, FAA Office of System Safety
Howard Posluns, Transport Canada
Jari Nisula, Airbus
Warren Randolph, FAA Office of System Safety
Ingrid Russell, SRA International, Inc.
Grant Schneeman, Abacus Technologies Corporation

WG C members and others who contributed their ideas and comments on this guide or who assisted in the review and documentation of specific Aviation Safety Sharing Systems are as follows:

Ismo Aaltonen, Finnair
David Briles, FAA Office of System Safety
Jack Cole, Air Transport Association
Ed DeCampli, Helicopter Association International
John Denman, International Air Transport Association
Carolyn Edwards, FAA Office of System Safety
Shozo Hirose, Association of Air Transport Engineering & Research, Japan
Cristina Hunt, Phaneuf Associates Incorporated
Silvano Manera, Alitalia
Alex, Richman, Algo Plus Consulting Ltd.
Jean-Jacques Speyer, Airbus
Fabio Toti, Alitalia

THIS PAGE LEFT BLANK

1.0 Introduction

1.1 Purpose of Guide

The purpose of this guide is to encourage airlines to share aviation safety information to improve safety. In this guide, Global Aviation Information Network (GAIN) Working Group C (Global Information Sharing Systems) has documented various approaches to sharing safety information among airlines using automated systems. WG C hopes to illustrate the value of sharing information with others, discuss considerations for implementing a sharing system and highlight the different types of sharing systems in use today. Since sharing systems are typically more valuable with more participants, WG C promotes sharing systems to help the systems obtain more participants. In addition to spurring additional airlines to join sharing activities, the information presented here can help organizations improve existing sharing programs or start new sharing initiatives by recognizing approaches used successfully in the airline community.

1.2 GAIN Overview

GAIN is an industry and government initiative to promote and facilitate the voluntary collection and sharing of safety information by and among users in the international aviation community to improve safety. GAIN was first proposed by the Federal Aviation Administration (FAA) in 1996, but has now evolved into an international industry-wide endeavor that involves the participation of professionals from airlines, employee groups, manufacturers, major equipment suppliers and vendors, and other aviation organizations. To date, five world conferences have been held to promote the GAIN concept and share products with the aviation community to improve safety. Through 2003, nearly 900 aviation safety professionals from 49 countries have participated in GAIN.

The GAIN organization consists of an industry-led Steering Committee, three working groups, a Program Office, and a Government Support Team. The GAIN Steering Committee is composed of industry stakeholders that set high-level GAIN policy, issue charters to direct the working groups, and guide the program office. The Government Support Team consists of representatives from government organizations that work together to promote and facilitate GAIN in their respective countries. The working groups are interdisciplinary industry and government teams that work GAIN tasks within the action plans established by the Steering Committee. The current GAIN working groups are: Working Group B--Analytical Methods and Tools, Working Group C--Global Information Sharing Systems, and Working Group E--Flt Ops/ATC Ops Safety Information Sharing. The Program Office provides technical and administrative support to the Steering Committee, working groups, and Government Support Team.

1.3 Working Group C: Global Information Sharing Systems

GAIN Working Group C was chartered by the GAIN Steering Committee in January 1999 to "promote and facilitate the development and implementation of systems to support the global sharing of aviation safety information." The Steering Committee has assigned three focus areas to WG C to help accomplish that mission:

- Facilitate the development of systems to share airline safety event information among trusted groups in near-real time
- Promote aviation industry sharing systems
- Facilitate the development of a system to share safety lessons learned and corrective actions within the aviation community.

This guide was developed to specifically address the second item.

WG C is a collaborative effort involving volunteers from airlines, governments, airframe and avionics manufacturers, university research groups, software vendors, and others interested in furthering aviation safety. WG C activities are directed by the GAIN Steering Committee and elected WG co-chairs. As of June 2003, the WG C co-chairs are Mr. Tom Curran, Manager Air Safety at Aer Lingus and Mr. Howard Posluns, Chief, Advanced Technology, at the Transportation Development Centre of Transport Canada. Membership in WG C is open to any interested volunteers. These volunteers have worked with the GAIN Steering Committee to develop Work Plans that lay out specific tasks to accomplish the mission of WG C. WG C members have met every 2 to 3 months since 1999, held teleconferences between meetings, and exchanged many ideas, information, and draft products by e-mail. The members volunteer to work on various aspects of the Work Plans and collaborate with other WG C members to assess progress and improve on interim products.

1.4 Scope

This guide documents all "automated airline aviation safety information sharing systems" known by GAIN WG C to exist in the world. WG C defines such systems as follows:

> *Computer-based systems that allow airlines and/or their airline organizations to share aviation safety information with other airlines and/or their airline organizations via e-mail systems, web-based systems, or transmittal of electronic storage media (e.g., CD-ROMs).*

This guide does not attempt to document many other systems or activities that share aviation safety information, many of which have been used for years and may be very effective and/or efficient in their own way. This guide is limited to systems that are automated, so it does not include sharing activities that involve exchange of paper-based information or verbal information (such as round-table meetings of safety officers). This guide is limited to systems for sharing information among airlines and/or their airline organizations (such as the International Air Transport Association or the Air Transport Association of America), so it does not include sharing activities designed to involve airframe manufacturers, government regulators, or other safety groups (although certain information from the sharing activities documented in this guide may be shared with other groups, usually in a limited fashion). This guide is limited to systems focused on organization-to-organization "sharing," so it does not include systems where individuals report safety issues (such as the Aviation Safety Reporting System--ASRS--to which pilots, controllers, and others can report safety concerns) or systems that "collect" safety information (such as databases of accident investigation boards or incident reporting programs run by civil aviation authorities).[1]

1.5 Organization of this Guide

The remainder of the guide is organized into four sections (2.0 through 5.0) with one section for each of the following areas: How Information Sharing Contributes to Flight Safety; Considerations for Implementing Sharing Systems; Types of Sharing Systems; Summaries of the Automated Airline Safety Information Sharing Systems.

This guide also contains two appendices. Appendix A contains a feedback form and Appendix B contains a list of acronyms used within this guide.

1.6 Guide Update and Feedback

WG C plans to update this guide periodically to include information on additional aviation safety sharing systems. The WG encourages readers to provide feedback regarding their experience with any of the sharing systems contained in the guide and to nominate others for possible inclusion. Suggestions for improving the usefulness of this guide are also requested. A feedback form for this purpose is included in Appendix A.

[1] Another GAIN group, the GAIN Government Support Team, has documented a variety of government-operated systems that collect safety information, in the report "Updated List of Major Current or Planned Government Aviation Safety Information Collection Programs," June 2003 (available at *www.gainweb.org*).

THIS PAGE LEFT BLANK

2.0 How Information Sharing Contributes to Airline Flight Safety

The progressive improvement in airline flight safety that has taken place over the past decades has resulted in a remarkably safe system, in which accidents or even major incidents occur very rarely. However, this in turn poses a challenge to efforts within the airline industry to continue to improve its safety record. Not only does new information from accidents and incidents become available relatively infrequently, but as existing threats are addressed through industry-wide efforts, there is a growing recognition of the need to also address emerging threats that may not yet have resulted in accidents. Flight safety management is about identifying and managing both existing and new threats, and the first requirement is to know which threats to address. The necessity of learning from incidents with less serious consequences in order to make changes that reduce the likelihood of more serious incidents or accidents is therefore becoming widely recognized.

However, any one airline may not have enough experience from its own operations for a clear pattern to emerge from its own incident reports, or may not yet have encountered any incidents of a type that other airlines are beginning to experience. In some cases, such as introducing a new aircraft type or serving a new destination, an airline will not yet have had the opportunity to obtain information from its own operations. Therefore the importance of sharing information on both incidents and the lessons learned from each airline's analysis of its own safety data is also becoming more widely recognized. It is this recognition that motivates the efforts of the Global Aviation Information Network to facilitate and promote the sharing of safety related information.

2.1 Benefits of Sharing Safety Information

The obvious, and important, benefit of sharing safety related information lies in reducing the risk of an accident through more timely recognition of both existing and emerging threats, and ways to address them. While accidents are fortunately very rare, when they do occur, they impose enormous costs on the airlines involved, not to mention the often tragic consequences to the passengers, airline personnel and third parties directly involved.

Specific ways in which sharing safety information can reduce the risk of an accident include:

- Gathering additional information on types of event that an airline has not experienced very often, to permit the identification of an emerging trend or to assess the effectiveness of potential corrective actions;
- Identifying other airlines that have experienced the same or similar problems to facilitate obtaining information on the characteristics of those problems and their experience with corrective actions;
- Alerting other airlines to the occurrence of events that they may not have experienced, or to the effectiveness of corrective actions that have been implemented;
- Gathering information on an operational area where an airline has limited or no experience, such as the introduction of a new aircraft type or initiating service to a new airport;

- Comparing the experience of an airline's own operations with that of other airlines, such as the frequency of certain types of event or the severity of the outcome of a specific type of incident.

Moreover, the wider dissemination of safety information also provides other, more immediate and tangible, benefits to those airlines participating in sharing this information. Corrective actions developed by other airlines might be less costly than those that might be tried in the absence of this information. Reduction of maintenance failures, or the early recognition of potential maintenance problems, can reduce flight delays and cancellations due to the need for unscheduled maintenance, as well as avoid the much higher costs of resolving unexpected problems in line operations. Sharing lessons learned from efforts to prevent accidents during ramp operations can reduce a major source of operational expense.

Sharing information from air safety reports and flight data monitoring can help reduce aircraft operating costs through improved flight operations that reduce the frequency of such events as go-arounds and in-flight diversions. Reducing the occurrence of unstabilized approaches at specific airports can contribute to reducing the incidence of such events as flap overspeed or hard landings, with their consequent costs in inspection and maintenance.

2.2 Examples of the Contribution of Information Sharing to Flight Safety

The following examples illustrate the potential flight safety benefits that can result from sharing information between operators. While they are only intended to be illustrative, and are not claimed to be descriptions of real incidents or information sharing activities, they are based on actual incidents that have occurred.

Example 1

A number of air safety reports at Airline A identified a problem at a specific airport with local air traffic control procedures that resulted in a relatively high rate of unstabilized approaches. This was confirmed by Airline A's flight data monitoring program. Following discussions with the local air traffic service provider, Airline A changed its company standard arrival procedures at the airport, with a consequent reduction in the occurrence of unstabilized approaches. Airline A distributed this information through a safety information sharing system in which it participated. Two other airlines, which also operated into that airport but were unaware of the problem, reviewed these findings with their pilots and decided to modify their own standard arrival procedures to be consistent with those of Airline A.

Example 2

Airline B experienced the loss of an engine cowl on one of its aircraft during takeoff. Investigation revealed the cause to be the failure of line maintenance personnel to properly secure the cowl latches following routine engine maintenance, due in part to the lack of color contrast between the latch recesses and the adjacent cowl livery. Airline B subsequently modified the color of the latch recesses to facilitate visual recognition of incorrect latch alignment, and amended its line maintenance procedure to include a cross-check of cowl latch security. It also posted an incident report on a safety information sharing system in which it participated and notified other operators of the same equipment participating in the safety information sharing system. Several of these operators subsequently modified their line maintenance procedures and some also modified the latch recess color scheme.

Example 3

In the course of a routine inspection, Airline C discovered a cracked engine mounting bolt that could have led to an overstress of the engine mounting and an in-flight loss of the engine. A check of incident reports on a safety information sharing system in which the airline participated revealed that two other operators had experienced the same problem and had concluded that the procedure for engine removal and replacement had the potential to overstress the mounting bolt if the engine was misaligned during replacement. These airlines had devised and adopted a different procedure for engine removal and replacement that avoided the potential problem. Airline C then adopted the new procedure and notified other operators of the same equipment participating in the safety information sharing system of the potential problem.

2.3 Role of Information Sharing Systems

The benefits derived from sharing safety information depend on the nature of the information that is shared. To be useful, it is necessary for an airline to be able to tell whether the circumstances that generated the information being shared are relevant to its operations. It is also desirable that the information being shared has been refined to avoid the need to synthesize a large number of reports from many sources. For information sharing to be worthwhile, there needs to be a balance between the work involved and the value of the information. The development of information sharing systems has simplified the process of sharing information and allowed users to be much more selective. This has a number of benefits for the flight safety management process itself:

- It can save staff time by reducing the need to make separate individual enquiries to gather information;
- It eliminates the element of chance in sharing information through ad-hoc networking;
- It can save time when good corrective actions have been identified by others who have experienced similar problems.

THIS PAGE LEFT BLANK

3.0 Considerations for Implementing a Sharing System

There are several considerations when implementing a safety sharing system within an organization. Such considerations include data quality, information protection, data integration, and information collection and information distribution. In the following sections, these five considerations are discussed in more detail.

3.1 Data Quality

One consideration for implementing a sharing system is understanding the various approaches to how the quality of the shared data is assessed. Typically, sharing systems integrate data from a wide variety of independent flight safety event reporting systems, all with varying levels of data quality. This is not to imply that one airline has better 'quality' data than the other, but rather to develop an understanding that many airlines have different approaches to documenting a similar incident within their organization. Because of these differences, it is important for members of a sharing community to have a clear understanding as to how these differences are identified, assessed and compensated for.

Typically, each airline safety event reporting system was developed for specific users who share a common safety culture, a common language, a common set of standard operating procedures and similar reporting requirements for an incident. Because these commonalities are generally understood within an individual airline, it is deemed unnecessary to document them. However, a sharing system community is a disparate group that has no shared understanding of quality issues associated with each of the sets of data being shared. As a result, it is somewhat difficult for a sharing system to provide its users with data of known quality. To meet this challenge, some sharing systems may adopt a data quality assessment approach that provides a framework for assessing the quality of the data and conveying the findings of the assessment to its users. Such characteristics include:

- Completeness – Data fields with values filled. Missing data can significantly diminish the analytical value of the data;
- Consistency – The manor in which information is recorded by and among respondents. A technical approach to determine consistency is to develop filters that assess the degree to which information is consistently reported;
- Validity – The degree to which field values adhere to the code tables or range constraints associated with a particular data element. The validity of data is determined by filters that validate ranges, codes and data types;
- Accuracy – The value in a particular data field is correct. This can be determined through the application of rules that can predict the value of one filed by considering the contents of other fields.

3.2 Information Protection

Preventing unauthorized access to or use of sensitive data is paramount to an organization. Therefore before agreeing to use a sharing system, an airline must be satisfied that the methods for protecting sensitive information have been well addressed. Some information protection methods include the de-identification of shared data, Memoranda of Understanding, limiting the amount of data shared and de-centralization of the data. Other methods for protecting information include system security techniques such as password management, firewalls, encryption, and database access controls. Of these methods, any combination may be used to protect the information shared within the system.

The most common of the aforementioned methods is the de-identification of data before it is integrated into a sharing system. The process involves identifying revealing information and removing it before the data is shared. This may be done either manually or through automation. Information such as gate numbers, city pairs, crew names and airline flight numbers may all be removed before sharing. An event date may also be de-identified, setting the date to the first of the month. Lastly, another approach to de-identification includes limiting the number of records and fields that are shared, availing only a subset of data for use within the system.

Another common approach to protecting shared information is for members to enter into an agreement or understanding with other members of the sharing community. These agreements specify the type of data to be shared, who may use the data and for what purpose. Most of these agreements come in the form of Memoranda of Understandings, Non-Disclosure Agreements as well as Bailee Agreements. In some cases, simply accepting a license agreement while installing the sharing software binds a member to a 'code of conduct', a set of rules to abide by while using the system. A breech or default in any of these forms of agreements typically leads to expulsion from the system.

An emerging form of information protection is the de-centralization of the shared data. This approach allows the data to remain on-site so that the data owner maintains control of the information. Using a data map, members map shared fields within their flight safety event management systems to a virtual repository via the Internet. Using administrative features, a data owner has the ability to modify access rights by user, developing a set of trusted peers or trusted peer groups. Furthermore, using these administrative tools, a data owner has the ability to limit access to lesser-known entities to less sensitive fields and records.

System security is yet another consideration with respect to information protection. Requiring password and identification credentials assists in limiting unauthorized access to the system. Use of encryption software to transmit data provides a high-level of protection and is easily implemented. Sharing systems that use the Internet may use two severs as opposed to one, separating the application software form the sharing database and placing an additional firewall between the two. Data within a database may also be encrypted, thus adding yet an additional layer of protection. Lastly, system maintenance also plays a role in system security, including the proper implementation of operating system and application patches.

3.3 Data Integration

When considering sharing information among a multitude of dissimilar data sources, several methods and techniques should be considered when integrating heterogeneous flight safety event reporting systems. A wide range of information cannot be found in any single unified information source, and therefore the information must be actively collected and assembled in a manner that supports the needs of the sharing participants. These needs may include the ability to research a suspected safety hazard, post a lesson learned, learn more about a corrective action, perform analysis and/or identify trends.

The first step in integrating dissimilar data into a sharing system involves identifying data fields that are common among the different flight safety event reporting systems. Once the common fields are identified, the fields are reviewed for relevancy, based on the information needs of the user. Such relevant fields may include make/model, airport name, phase of flight or type of event. Once the relevant fields are established, a map is generated mapping the common fields among the dissimilar data sources to create a virtual subset of data. Once the information is mapped, the next step is to organize the data within a mapped data framework so that users of the sharing system can conveniently manipulate the information. This process typically involves converting the data from dissimilar data systems into a common standardized format.

3.4 Information Collection

Another consideration when implementing a sharing system is to examine the various approaches to collecting the data to be shared within the system. One approach uses on-line discussion forums or electronic bulletin board systems. Here, a member of a sharing system may share important safety information by posting it on a discussion board or on-line forum. A more complex approach to collecting information requires the periodic extraction of data from multiple, disparate flight safety event management systems and merging the data into a central repository. Members of these types of sharing systems typically export a subset of data from their individual flight safety event management system, de-identify it and submit it for use within the sharing system. Lastly, an uncommon but emerging approach includes the use of the Internet to network several airline flight safety event management systems by mapping individual data fields within each airline's event management system to a virtual repository that is available to all members.

3.5 Information Distribution

One last consideration when implementing a sharing system is to understand the various methods used to distribute the shared information. Such methods include magnetic media, the Internet and written publications. Systems that use a de-centralized data approach for sharing information utilize the Internet to connect members to one another's data. Some systems periodically merge de-identified data from multiple airlines and distribute it to members for individual analysis. This merged data is typically placed on CD-ROM and sent to all members who contributed. Furthermore, some sharing systems not only collect and merge the data but also perform an analysis on the merged dataset and distribute a periodic report with the findings. Such reports may be distributed as a hard-copy publication or as a document on a CD-ROM. Lastly, some sharing systems utilize electronic bulletin boards to distribute information. Members of this type of sharing system gain accesses to the data by reading posts to specific topics found within the bulletin board discussions. In just about all cases, each of the information sharing systems discussed in the Section 4.0, Types of Sharing Systems, utilize various combinations of the three distribution methods discussed above.

THIS PAGE LEFT BLANK

4.0 Types of Sharing Systems

The sharing systems described in this guide are classified into three basic types of systems: Near-Real Time Event Sharing Systems; Periodic Aggregation and Analysis Systems; Lessons Learned and Corrective Action Systems. Each type represents a unique method for sharing aviation safety incident and event information with other airlines. Some systems offer analysis of merged data while other systems provide a means to query another airline's safety data directly. Moreover, some systems have characteristics that span all three types thus forming a hybrid. For the purpose of this guide, each of the nine systems discussed in Section 4.0, Summaries of Automated Airline Safety Information Sharing Systems, has been assigned to one of the three types that most closely matched its characteristics.

4.1 Near-Real Time Airline Safety Event Sharing Systems

A near-real time airline safety event sharing system ("NRT system") provides a means to transfer safety information, at any time, from anyplace, over the Internet. System participants can send information they believe would be of interest to other participants and can query the safety event databases of other airlines participating in the system, if such rights are granted. Information is not aggregated "in bulk" but only in response to particular queries, so there is no central repository of information.

Information shared in NRT systems represents the latest information contained in airline's internal database. NRT systems are not considered "real time" because there will be a lag between the time of the event and the time information on the event has been collected by the airline safety office, entered into their safety database, and cleared for use in the sharing program.

NRT systems utilize highly secure transmissions to protect the information. Existing NRT systems utilize a brief report format with limited fields of standardized information designed to convey the possible relevance of a particular issue "at a glance." These systems provide a participant the opportunity to follow-up with the source of a particular report to gather further information, if the source agrees. De-identification of source data is used in some NRT system, while others provide the option to participate with other closely trusted partners--usually safety officers who know each other personally and trust each other to protect the shared information.

Figure 1 provides an illustration of four airlines within a trusted group sharing information with one another. Some airlines employ-Memoranda of Understanding, which clearly state the purpose and use for any data obtained within the system. Near-real time systems generally interface with multiple types of flight safety event reporting systems, sharing information via a near-real time broker that transmits information between participating airlines, but does not store any information.

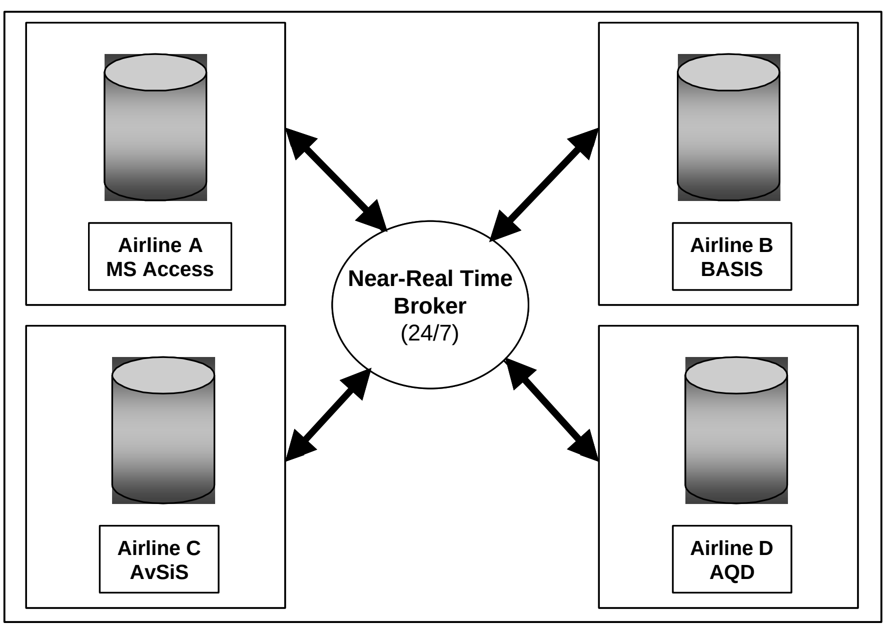


Figure 1 -Near-Real Time Airline Event Sharing System Functional Diagram

4.2 Periodic Aggregation and Analysis Systems

Periodic aggregation and analysis systems provide a means for collecting de-identified, standardized safety event records from multiple airlines, merging the data into one dataset and re-distributing the data to original contributors for individual analysis. In some cases, analysis services are provided and a periodic analysis report is published, identifying industry trends as a whole. In most cases, the analysis report is distributed to all contributing members thus alleviating, for each flight safety office, the need to perform industry analysis and allowing it to focus on independent trend analysis such as comparing its own experience with the industry as a whole. In order to perform an individual analysis, an airline will have the ability to identify its own records among the merged dataset but will not be able to identify other contributing member event records, protecting the anonymity of all parties involved.

Figure 2 illustrates a sharing system in which three airlines with three different types of event management systems, send standardized, de-identified data to a central, trusted location where the data is merged into one dataset. Once the data is merged, it is redistributed to all three airlines for individual analysis. The merged dataset is also analyzed; identifying any emerging industry trends which are documented in a periodic report and distributed to all three contributing members.

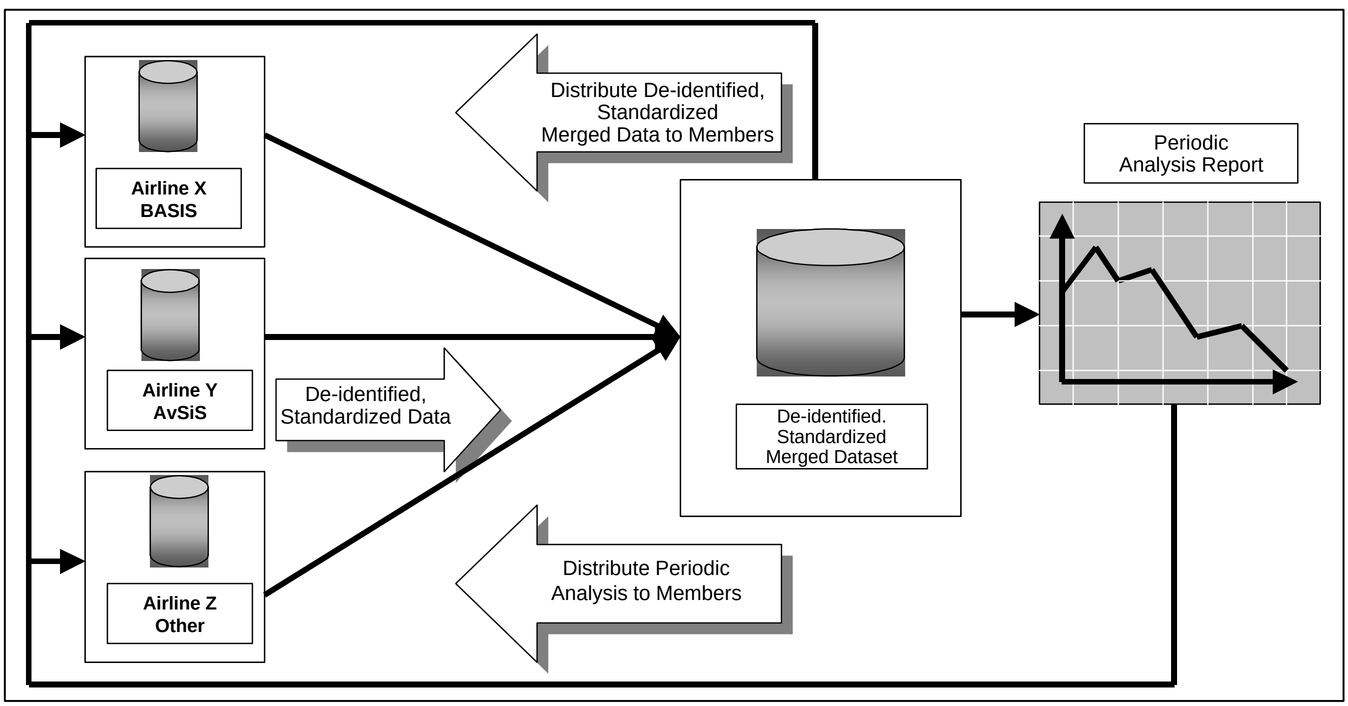


Figure 2-Periodic Aggregation and Analysis System Functional Diagram

4.3 Lessons Learned and Corrective Action Systems

A lessons learned and corrective action system provides an airline the ability to share knowledge gained from addressing potential safety hazards and to learn from the experiences of others. A lesson learned is envisioned as a “higher-level finding” that is derived from event reports or other information that is not event-related, such as “quality deficiencies” (maintenance issues) or general corporate knowledge about a particular issue, system, airport, etc. The lesson might be learned through the analysis of several incident reports from within an airline or from incidents shared by other airlines (such as the work being done by STEADES). “Corrective actions,” are the “fixes” applied by airlines to address the safety concern, once the lesson had been identified.

Lessons learned systems also provide a means for airlines to publish their own experiences of safety hazards for others to learn from. Airlines may also share their risk reduction and mitigation strategies for a specific safety hazard through this type of system.

Information within a lessons learned system does not necessarily originate from an airline. Some lessons learned systems import data from multiple existing sources, standardizing/coding the event by subject and placing it in a comprehensive repository. Such data sources may include military/airline safety journals, government sponsored anonymous reporting systems, safety recommendations, as well as government advisories and directives.

It is not uncommon for a lessons learned system to be self-monitored although there are systems where the content is validated before it is posted or placed in a searchable repository. Typically a user has the option to search or post information anonymously. Self-administered systems are designed to be an easy and informal way to share safety information, post questions and seek out answers, comparable to the concept of a “virtual water cooler” or electronic bulletin board.

Figure 3 illustrates three airlines all belonging to a lessons learned and corrective action sharing community. Here, any three of the airlines may log into the system independently and anonymously search for or post a safety lesson learned and/or corrective action. An airline may also post information within any of the discussion groups or search the repository for a relevant subject.

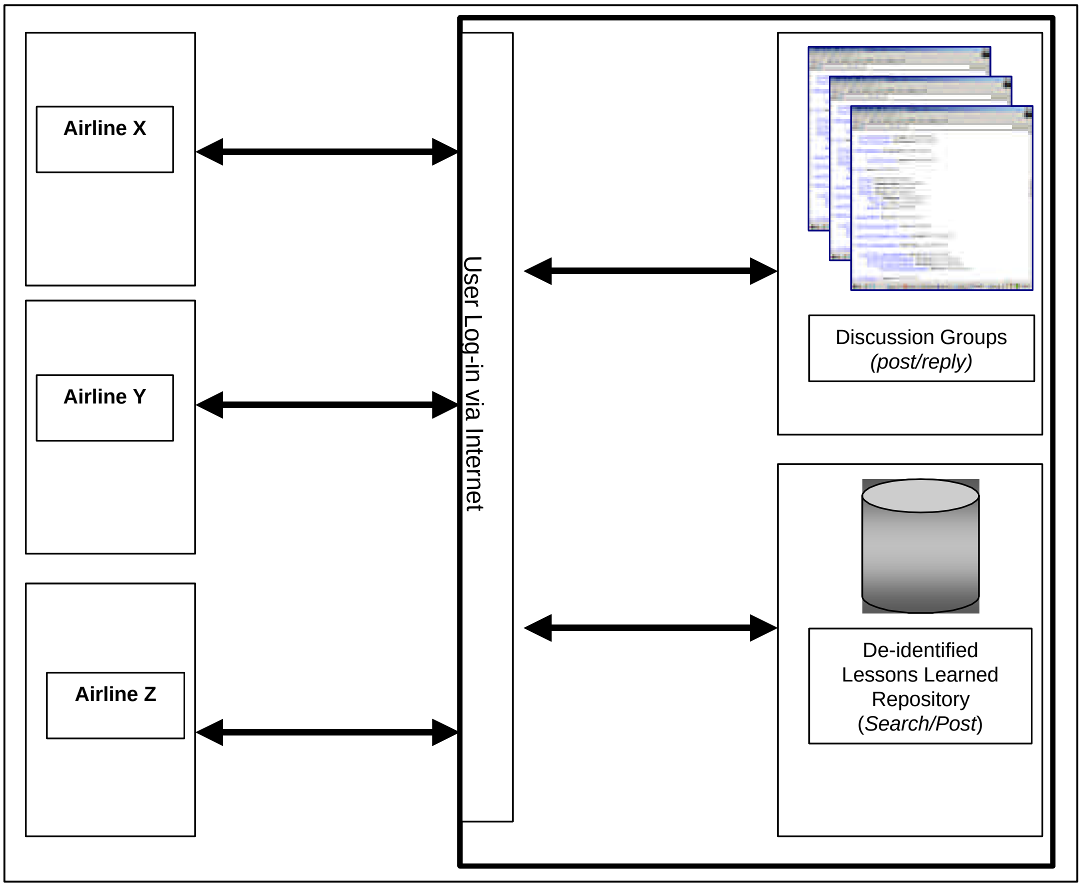


Figure 3 -Lessons Learned and Corrective Action System

THIS PAGE LEFT BLANK

5.0 Summaries for Automated Airline Safety Information Sharing Systems

In the following sections, nine sharing systems are featured, providing the reader with an overview of airline information sharing systems that are currently in use around the world. WG C solicited information from each of the sharing system administrators, requesting them to provide a summary for their system. For each of the nine systems, the summary may include the purpose of the system, sharing system participants, security features, type of data shared, method for sharing the information, the operational approach of the system and technology used to share information.

5.1 Air Transportation Association – Aviation Safety Exchange System (AASES)

AASES is an automated database of merged, de-identified incident data from member airlines. It examines data by aircraft type, incident category, incident type, location and frequency. Bar graphs and scatter diagrams are used to identify patterns and trends in the merged data that may not be evident from examining a single carrier's operations.

Type of Sharing System

❑	Periodic Aggregation and Analysis System
	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

Participants

Membership is limited to ATA members who choose to participate.

Type of Data Shared/Source of Data

Participants share data, at the record level, by periodically submitting a comma separated value file (CSV) via CD-ROM. The CSV is generated using local extraction routines that extract several common data elements from each participant's safety reporting system. The local routines de-identify and standardize the data, preparing it for amalgamation into the central AASES repository.

How is Information Used/Intent of Program

AASES performs a data refresh once every quarter, maintaining a rolling twenty-four month snapshot of amalgamated incident data. The merged data is used by ATA councils, committees and staff to identify trends and analyze areas of mutual needs. The merged data is also provided to the participating carriers for analysis of their individual areas of interest. Exposure data is also gathered, permitting the calculation of event rates such as rejected take-offs per total take-offs (individual airline rate versus industry rate). Each airline may compare its experience with the rest of the industry or look at historical patterns. The data can be used to support the integration of a new aircraft type (what other issues other airlines have had with a particular model), an airport/facility opening (what problems may occur at this location), or a new airport being served.

Security Features

Participants may elect to remove an entire record from the AASES extraction. Other security features include the de-identification of incident data before it is submitted to ATA to be merged. Direct and indirect references to the source airline and other airlines that may have been involved in the incident are de-identified by the process. Airline names, three-letter codes, flight numbers, gate numbers and other identifying information are detected by the automated process and translated into generic terms.

De-identification Process and Approach

Before the data is transmitted to ATA for amalgamation, data is de-identified at each member's physical location. Using local META data repositories, local routines sanitize the data to remove names, flight numbers, gates and three letter designator codes.

Once the data is merged into a comprehensive dataset, only the record owner will have the ability to re-identify its own records.

Sharing System Technology Used

In order to minimize member software expenditures, AASES utilizes Microsoft Office and Internet Explorer/Netscape. Using Java 1.2 and JDBC, the data is extracted from the member's safety reporting system, placed into a comma separated value (CSV) file and sent via CD –ROM to ATA Headquarters where it is merged into a master AASES database (MS Access). Once the data has been merged and cleansed, it is redistributed via CD-ROM to all members for analysis (MS Excel). Reports are created using XML and XSLT. Lastly, AASES has built-in help features and uses InstallShield® for easy installation.

Operational Approach

Participating airlines send de-identified, standardized datasets to ATA Headquarters to be merged with other participating airline datasets. The merged dataset is then distributed to participating members to use for analysis and benchmarking. The merged data set is accompanied with exposure data. ATA council and staff may also use the data to perform analysis.

Standardization/Consistency of Data

At the time of development, standards were adopted that were unique to the AASES users group. International standards may be considered for later releases, once the standards are agreed upon.

Level of Maturity /Status/Version

Currently AASES has a beta version. A newer version is currently being developed.

Future Plans for the Program

Future plans the expansion of AASES membership to all ATA members.

Air Transportation Association – Aviation Safety Exchange System (AASES)

(continued)

Point of Contact

Thomas Farrier
Air Transport Association of America
Director of Safety Programs
Tel: +1.202.626.4116
Fax: +1.202.626.4149
tfarrier@airlines.org
http://www.airlines.org/

5.2 Aviation Safety Information Network (ASI-NET)

In late 1999 ASI-NET in Japan started its operation to exchange confidential safety information among Japanese airlines. The server for ASI-NET is located at the Association of Air Transport Engineering and Research (ATEC) and connected to each airline's client computer by public telephone line. Each participating airline sends its report using Lotus Notes (after de-identification) to the server. Then, each participating airline can read the report. The ASI-NET Committee will analyze the information to identify safety concerns and suggest/promote corrective actions. In addition to confidential safety reports, the system contains some other reports for the convenience of member airlines such as information on Irregular Operations in Japan published by JCAB.

Type of Sharing System

❑	Periodic Aggregation and Analysis System
	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

Participants

Seventeen airlines participate in four different groups, the JAL group (6 airlines), the ANA group (3 airlines), the JAS group (2 airlines) and an Independent group (6 airlines). Airlines within a group have already shared information. Through the use of ASI-NET airlines can now reach the other groups' information.

Type of Data Shared/Source of Data

Information accessible through ASI-NET comes from several sources. Flight crews voluntarily share safety information and captains submit human factors information through a Captain report. 234 reports have been submitted since 2000, 81 Voluntary safety reports and 153 Captain reports. The JCAB submits information on Irregular Operations, 426 reports have been submitted since 1999, and ICAO provides ADREP information, approximately 7300 since 1974.

How is Information Used/Intent of Program

The object of ASI-NET is to contribute to flight safety by sharing safety information among member organizations, and making safety recommendations based on the findings from collected information, to the parties concerned.

Security Features

Access to the system is password protected, with each user having their own identification and password. The information within the system is protected by confidentiality of information, through non-punitive policy at each of the airlines and through non-accessibility by the aviation authorities.

Aviation Safety Information Network (ASI-NET)

(continued)

Operational Approach

ASI-NET is guided by a steering committee that meets twice annually. The purpose of the steering committee is to manage ASI-NET and to approve any formulated safety recommendations. Members of the steering committee include a former chairman of the Aircraft Accident Investigation Committee (AAIC), aeronautical specialists, and representatives from major airlines.

Working Groups within ASI-NET are to carry out plans developed by the steering committee. The working groups meet quarterly. Group tasks include generating summary reports using the network information as well as analyze the information and formulate safety recommendations.

Approved safety recommendations are distributed to all concerned parties, including airline safety personnel and pilots.

Standardization/Consistency of Data

Three groups of terms are standardized in ASI-NET: human related, aircraft/system related and event related. The terminology is standardized to enhance confidentiality and to facilitate information reference.

Level of Maturity /Status/Version

ASI-NET was established in December of 1999 and continues to expand and seek new members.

Future Plans for Program

In the future, ASI-NET would like to expand the base of reporters, would like to provide institutional immunity protection, and increase publicity and feedback of the system.

Point of Contact

Shozo Hirose
General Manager/Engineer
Association of Air Transport Engineering & Research, Japan
Atec00@jb3.so-net.ne.jp
+81-3-5476-5461

5.3 Aviation Safety Data Sharing System (ASDSS)

ASDSS is a readily accessible web-based solution, which allows safety officers to query data from disparate safety databases (BASIS, AQD, Access, etc.) of several participating airlines simultaneously. The data is presented in the form of Standard Sharing Reports (SSRs) via an automatic extraction from the internal safety database. The unknown originator of the SSR may then be contacted for further details.

Type of Sharing System

	Periodic Aggregation and Analysis System
❑	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

Participants

Currently Air New Zealand is the only participant in this system. Canada 3000 was an initial participant but is no longer operating.

Type of Data Shared/ Source of Data

Reports are shared amongst the participants through the ASDSS system, which consolidates, in a proxy server, the data from the participants. Each report contains the Date, Aircraft make, model and series, Event Category, ATA Code(s), Phase of Flight, Airport or Route, Weather Conditions, Event Category, Probable Cause and Corrective Action.

How the Information is Used / Intent of Program

The system is used to inform peer organizations of problems / issues. The system is used to see if other organizations have had a similar event before (and learn from their experience). The system may be used for building a case by supplementing an airline's own data with that from other organizations.

Security Features

The user controls access to their data at field, record and system user levels. Users log in. Data is sent as an encrypted package to other users (128 bit encryption – system of public / private keys).

De-identification Process/Approach

Users may send information anonymously. Data may be further de-identified by substituting keywords.

Sharing System Technology Used

Internet based system accessed through a 128-bit Web Browser.

Operational Approach

Records are shared (e.g. A Basis SIE export, an SQL extract) using ASDSS. Using a Web Browser, users log in to the system, execute a search and browse the results. A blind email may be sent to the originator of the report for more information.

Standardization/Consistency of Data

Mapping based on the GAIN Standard Sharing Report (SSR) format.

Level of Maturity

Released and used by two airlines in 2001.

Future Plans for Program

Future plans include expanding participation to other airlines worldwide.

Points of Contact

Howard Posluns
Transport Canada
Transportation Development Centre
Montréal, Québec, Canada
+1 (514) 283-0034
poslunh@tc.gc.ca

Robert Aubé
xwave
Stittsville, Ontario, Canada
+1 (613) 831-0888
robert.aube@xwave.com

5.4 AvShare

AvSoft, Ltd. designed this highly secure near-real time message based safety information sharing system, which enables safety officers to set up trusted groups via the Internet. These registered users may then be grouped to reflect a wide variety of categories including alliance partners, flight safety officers peers, sister companies, or remote stations. User share encrypted Standard Sharing Reports (SSRs) and other pertinent information including images.

Type of Sharing System

	Periodic Aggregation and Analysis System
❑	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

Participants

Current participants: Aer Lingus, Finnair, Channel Express, BMI Regional. Three more airlines expected to participate during 2003.

Type of Data Shared / Source of Data

Data may be sent to or requested from other airline(s). Data is shared at the event/record level. The selection of fields to be shared between two users is not limited by AvShare but may be limited by the users. AVSiS users have the option of sharing all fields. Non-AVSiS users map common data fields, such as make/model or event type, to participate in the system.

How the Information is Used / Intent of Program

The system is used to inform peer organizations of problems / issues. The system is used to see if other organizations have experienced similar events and learn from their experience. The system may be used for building a case by supplementing an airline's own data with that from other organizations.

Security Features

The user's control who may see what of their data at field and record level. Users log in. Data is sent as an encrypted package to other users (128 bit encryption – system of public / private keys). Data is not on a website and is not centralized.

De-identification Process / Approach

Users may send information anonymously. Data is not de-identified.

AvShare
(continued)

Sharing System Technology Used

Multi-tiered client-server application

Operational Approach

Users form trusted groups with whom to share confidential information peer to peer.

Standardization / Consistency of Data

Mapping based on AVSiS and the GAIN Standard Sharing Report (SSR)

Level of Maturity

Release of version 2.0 on January 2003

Future Plans for Program

Grow user base. Enhance application with further releases based on user requirements.

Point of Contact

Tim Fuller
AvSoft
Tel: +44 1788 540 898 or US toll free 1-866 348 4503
http://www.avsoft.co.uk

5.5 International Air Transport Association (IATA) Safety Information Exchange (SIE)

The Safety Information Exchange was originally operated by British Airways as a method for airlines using the British Airways Safety Information System (BASIS) to share operational data on safety events. SIE grew to the point where BA believed it would be better hosted at a neutral organization, rather than at a commercial airline. IATA has since taken over running the SIE, using it as a conduit to collect data for its STEADES programme. British Airways continues to support the software.

Type of Sharing System

❑	Periodic Aggregation and Analysis System
	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

Participants

Participants of the IATA SIE programme are confidential to IATA

Type of Data Shared / Source of Data

Users of Air Safety Reporting (ASR) produce the BASIS extract and send their data quarterly to IATA. The data is de-identified at source and merged into one global database which is then distributed to those users who have contributed data. The merged SIE database is sent out every quarter and contains incidents occurring during the preceding 12 months. This service was originally supported by the BASIS Team when it was known as BASIS-SIE but is now provided by IATA under the auspices of the STEADES Project.

How the Information is Used / Intent of Program

This is a pro-active method of reviewing past air safety incidents, before they happen again. Even if an airline has already experienced the same problem, the SIE database is a powerful source of information when trying to convince others that an airline’s incident is not an isolated case. Also, such an enormous database allows small fleet operators access to safety information from a much larger fleet database.

Security Features

No security information provided about security.

De-identification Process / Approach

Data is de-identified at the airline source then the extraction routine is performed.

International Air Transport Association (IATA) Safety Information Exchange (SIE)

(continued)

Sharing System Technology Used

WinBASIS is used to enter data to send to IATA via its built-in SIE export function.

Operational Approach

Users extract and send their data quarterly to IATA, which in turn de-identifies, merges and distributes a consolidated data file to members of SIE.

Standardization / Consistency of Data

Data submitted to IATA varies widely by the source and depends on the stage of the investigation (if any), the details available, the reporting culture of the operator, and how the incident was classified.

Level of Maturity / Version

See the description of STEADES for further information on the future of this program.

Future Plans for Program

SIE is only being offered to current users, no new members are being accepted into the program.

Points of Contact

IATA SIE:
John Denman, IATA
Telephone +1 (514) 874-0202 ext. 3203
E-mail: denmanj@iata.org
http://www.iata.org/oi/safety/steades

BASIS Software:
Eddie Rogan, British Airways
Telephone: +44 (0)20 8513 0225
E-mail: eddie.1.rogan@britishairways.com
http://www.winbasis.com/

5.6 International Air Transport Association Safety Trend Evaluation and Data Exchange System (STEADES)

STEADES is a global incident sharing system that consolidates inputs from multiple airlines, and then analyzes the resulting data for useful and/or significant trends and findings. Reports are distributed to members on a regular basis. The ten airline safety officers comprise the STEADES Steering Group and provide guidance on subjects that are of particular interest and should be looked at in greater detail in the reports.

Type of Sharing System

❑	Periodic Aggregation and Analysis System
	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

Participants

Currently there are a number of participants including major international air carriers, smaller local operators, manufacturers, research organizations, and other associations. Helicopter operators also participate.

Type of Data Shared / Source of Data

The database will consist initially of de-identified data from approximately 40 airlines (generally of the order of 50,000 records per quarter). The data shared is at the event/record level. This amount of data will cover approximately 95% of all international commercial air traffic and a very substantial amount of domestic traffic.

How the Information is Used / Intent of Program

STEADES is a global safety event database providing analysis of events, with the goal of reducing accident potential and, therefore, costs. It is based on an open, non-punitive, reporting system which is compatible with other reporting systems. It identifies trends and areas of potential concern (e.g., in fleets, areas, operations), thereby giving IATA and the airlines an overview of industry performance and standards. It will also contribute to risk assessment.

Security Features

The STEADES database is securely hosted on the IATA premises. No external party has direct access to it.

De-identification Process / Approach

Data is de-identified at the airline source then the extraction routine is performed.

International Air Transport Association Safety Trend Evaluation and Data Exchange System (STEADES)
(continued)

Sharing System Technology Used

No proprietary software is required for membership in STEADES. Airlines and agencies that do not have a computerized event recording system can be provided custom software at a nominal cost.

Operational Approach

On a quarterly basis, STEADES members will forward a file of their air safety events to IATA, using the specifically developed exchange model. This information will be collated with data from all other participating airlines and analyzed for trends and issues of concern. Trend Reports will be generated and distributed to members following the analysis process. Reports are published quarterly and are available to members in hardcopy and CD-ROM versions.

STEADES data is analyzed by a neutral, impartial and respected industry body, which is not connected with any airline, manufacturer or regulatory bodies.

Standardization / Consistency of Data

Data consistency varies by source in its detail, however the STEADES team constantly monitors the data for any inconsistencies and effect immediate repairs, ensure maximum data quality.

Level of Maturity / Version

STEADES was launched in October of 2001, and has since attracted operators, aviation associations, and other agencies into its membership. The first STEADES report was issued in 2002, with the second report due in May 2003. The frequency of the reports will increase quickly, since the STEADES programme has been developing its analysis methodology to maturity over the last two reports.

Future Plans for Program

STEADES is a step beyond the BASIS Safety Information Exchange (SIE) Scheme, in that it includes analysis to identify trends and other conclusions, which is not done with BASIS SIE. Plans include an interface with other safety initiatives, such as IOSA, LOSA, and FOQA (Flight Data Monitoring). This program is expected to expand to include approximately 250 airlines over the next four years. In the longer term, IATA envisages expansion of STEADES to interact with other systems and become a one-stop safety information shop.

Point of Contact

John Denman, IATA
Telephone +1 (514) 874-0202 ext. 3203
E-mail: denmanj@iata.org
http://www.iata.org/oi/safety/steades

5.7 International Air Transport Association - Safety With Answers Provided (SWAP)

IATA SWAP is a lessons learned system with two components, a web-based discussion board and a safety information archive. The web-based discussion board is an electronic repository where members can freely and openly post questions or findings about aviation safety, and then read responses and other comments from fellow safety professionals. The safety information archive contains important safety bulletins and messages that operators should be aware of.

Type of Sharing System

	Periodic Aggregation and Analysis System
	Near-Real Time Event Sharing System
❑	Lessons Learned and Corrective Actions System

Participants

Open to flight safety officers of all IATA member airlines, partnership programme members, and industry associates.

Type of Data Shared / Source of Data

A free and voluntary exchange of safety information regarding operational safety issues shared by the members of IATA through a web-based information exchange discussion group. SWAP is moderated by the users of the system, not by IATA.

How the Information is Used / Intent of Program

SWAP offers Safety Departments of airlines the opportunity to ask airside, cabin safety or operational questions towards other departments much like themselves. The discussion groups available on the site are divided into 3 main categories; Airside Safety, Cabin Safety and Operational Safety.

Security Features

The access to the private pages of this site, including the discussion groups, is limited to safety professionals of IATA Member Airlines, Partnership Programme Members, Members of the IATA Ground Handling Council, and Members of IATA's safety related committees, working groups, and task forces. Each person granted access to the site has access to all the discussion groups including Cabin, Operational and Airside Safety.

De-identification Process / Approach

Information on the site is not de-identified, however users may choose to post anonymously.

Sharing System Technology Used

Participation through on-line registration and collaboration software via the International Air Transport Association web-site.

Operational Approach

Records are entered and shared using SWAP. Using a Web Browser, users log into the system, execute a search query and browse the results.

Standardization / Consistency of Data

Data comes from a variety of sources, and is usually of excellent quality.

Level of Maturity / Version

The SWAP site is currently in its second version, after having been originally ported to the new web platform in 2001. The site was re-designed in 2002, and further changes will be made as needed.

Future Plans for Program

SWAP will eventually become fully integrated with STEADES, and the membership will be expanded to include STEADES members as well. The format of the site will continue as-is.

Points of Contact

Jill Sladen, IATA
Tel: +1 (514) 874-0202 ext. 3585
E-mail: sladenj@iata.org
http://www.iata.org/soi/safety/swap/index

5.8 Italian Flight Safety Committee (IFSC) Incident Sharing System

In 2001 IFSC began a program to collect standardized incident information from its member airlines in Italy. Fourteen to sixteen airlines are expected to participate by logging their incident reports using BASIS and submitting the de-identified reports electronically to the IFSC. These reports will be collated and sent back to the participating airlines. In addition, the IFSC will analyze the information at a national level to identify safety concerns and suggest/promote corrective actions.

Type of sharing system

❑	Periodic Aggregation and Analysis System
	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

Participants

The data sharing is only allowed to IFSC members.

Type of Data Shared / Source of Data

Participants share data, at the record level, by periodically exporting their data into a compressed file that will be sent to the IFSC. Members that use BASIS export their information into a WinZip file. Non-BASIS users export their information into a MS Excel file. IFSC members share only the "Mandatory Report" fields (see JAR-OPS1 1.420 Occurrence reporting). All IFSC members have agreed as to what information is to be shared, guaranteeing the de-identification of the data without limiting analysis and trending efforts. The standardization and amalgamation is managed by a working-group who has the task of validating the each event classification and risk assessment.

How the Information is Used / Intent of Program

IFSC members can perform trending by using tools found on the IFSC website. This feature is available to IFSC members only. Every six months these trends are reported on in a meeting. Using the trends, areas of mutual interest are identified and discussed.

Security Features

Every member is responsible for the security of its own data, while the IFSC is responsible for the data within the IFSC database. Security is guaranteed by using several security features of various application and database administration programs.

De-identification Process / Approach

Before the data is transmitted to the IFSC, the data is de-identified at each member's physical location. The information shared information includes:

- STATUS (Status of the event)
- DEPART/DESTINATION/LOCATION/DIVERSION (Flight data)
- FLIGHT PHASE
- EVENT TITLE/SUMMARY (Event description)
- RISKID/RISK (Risk assessment)
- MAJCAT1, 7/CE1, 7/BASISID1, 7/KWDA1, 7/KWDB1, 7 (Event classifications)

Sharing System Technology Used

The IFSC database is a BASIS repository. Members that use BASIS export their data using a built-in export feature. For non-BASIS users, the data is exported to MS Excel and subsequently converted to a format that is compatible with BASIS. The exported files are sent by email (Microsoft Outlook). Once the exported files are received at the IFSC, they are imported into the IFSC BASIS database. The IFSC database operator notifies contributing member that their export was received and that their information imported successfully.

Operational Approach

See "*How the information is used/Intent of program*"

Standardization / Consistency of Data

Standardization and consistency of the data is managed by a working-group who has the task of validating every event classification and risk assessment.

Level of Maturity / Version

BASIS/ASR version is 2.12.

Future Plans for Program

IFSC is planning to expand to Ground and Maintenance operators as well as develop a specific database that harmonizes reporting in terms of taxonomy and risk matrix.

Point of Contact

Captain Silvano Manera, Alitalia
Tel: +39 (0)6 6563 8352 or 8351
E-mail: manera.silvano@alitalia.it

5.9 Maintenance Malfunction Information Report (MMIR) System

The Federal Aviation Administration (FAA) and the Helicopter Association International (HAI) have joined forces to provide the aviation industry with the Maintenance Malfunction Information Report (MMIR) system. The MMIR program is today's solution to the time consuming process of hand writing numerous FAA and warranty claim forms. MMIR fulfills FAA Service Difficulty Reporting (SDR) requirements and creates manufacturer warranty claim forms. FAA/HAI designed the system to meet the requirements of FARs 145.63, 121.313, and 135.415 when incorporated into approved maintenance and operational programs. Also, MMIR is a standard format accepted by most Original Equipment Manufacturers (OEMs) and their warranty service systems. The main thrusts of the MMIR program are to enhance aviation safety and to reduce operating costs. Using MMIR, early identification of potentially fatal failures has provided overwhelming positive benefits to the aviation industry. The MMIR program can provide the aviation industry with much needed data that would otherwise be unavailable, enhancing aviation safety while reducing costs.

<u>Type of Sharing System</u>

❑	Periodic Aggregation and Analysis System
	Near-Real Time Event Sharing System
	Lessons Learned and Corrective Actions System

<u>Participants</u>

Paticipants include hundreds of helicopter manufactures, repair-stations and operators. The MMIR Software is available free of charge to anyone involved in the aviation industry, however, it does require that you register to be come a member.

<u>Type of Data Shared / Source of Data</u>

MMIR is a comprehensive database representing the most up-to-date maintenance information. The MMIR data format has created a standard for reporting service difficulties and warranty claims. The MMIR program is based on the full page, four copy, and self-carbonizing MMIR form introduced in the 1980s. By utilizing MMIR, maintenance departments have permanent records in a database that can be manipulated to provide specific cost and reliability information. MMIR makes use of default data fields, extensive pull-down menus, and automatic data filing via the Internet. The data is collected at HAI and analysis reports are available for MMIR users.

<u>How the Information is Used / Intent of Program</u>

The MMIR program is today's solution to the time consuming process of hand writing numerous FAA and warranty claim forms. MMIR fulfills FAA Service Difficulty Reporting (SDR) requirements and creates manufacturer warranty claim forms. Users of the program will recognize a savings in time, costs, and a vast reduction in paperwork.

Maintenance Malfunction Information Report (MMIR) System

(continued)

Security Features

The MMIR program and database are maintained on separate servers. Records are secure, and the user designates whether the reports are for internal use or sent to the FAA and/or the manufacturer. Only users that participate in the exchange of MMIR data with HAI will be allowed to access the database.

De-identification Process/Approach

There are three levels of user access to MMIR, each with different levels of authorization: Full, Read-only, and Manufacturer. All three levels are allowed to read “summary” reports; these are comprehensive (from the entire MMIR database) reports where all identification of the submitter and aircraft registration has been deleted. This is also the sole level of authorization for Read-only subscribers. Full access subscribers can also submit reports, which are then stored on the database server. The Full access subscriber can always review their reports in their entirety, but only theirs. Manufacturer access is used to designate an electronic destination point for MMIRs submitted as warranty claims. The complete report is automatically sent to the Manufacturer if so designated by the Full access submitter.

Sharing System Technology Used

Using the COTS (commercial off-the-shelf) database development program FoxPro, HAI developed a software version of the MMIR form during the mid-1990s. MMIR transitioned to a Web-based system in 1999. HAI continues to support the software version of MMIR, but is concentrating its efforts almost exclusively on Internet MMIR.

Operational Approach

MMIR is a Web-based application accessible from the MMIR website login page. MMIR users can query the service to see if problems of a similar nature have been reported by other operators, and the corrective actions taken. The MMIR service will not supply warranty information unless members have stated, in writing, that they have no objections to the release of this information.

Standardization / Consistency of Data

MMIR is a standard format accepted by most Original Equipment Manufacturers (OEMs) and their warranty service systems. For SDRs and MISs, MMIR transfers the data seamlessly to the FAA’s respective databases.

Maintenance Malfunction Information Report (MMIR) System

(continued)

Level of maturity /Status/Version

MMIR began as a 4-copy carbon paper form to file warranty claims and U.S. Service Difficulty Reporting System (SDRS) in 1984. During the mid-1990s, a software version of MMIR was created using commercial off-the-shelf software. In 1999, MMIR transitioned to a Web-based program. Only a computer with an Internet connection is needed to use MMIR; no special software is required.

Future plans for program

MMIR is constantly evolving. HAI currently is working on a major facelift of Internet MMIR that will also expand search capabilities. A private company, AlgoPlus, is developing a value-added service to provide advanced statistical analysis of MMIR data for Full access subscribers.

Point of Contact

Ed Dicampli
Lee Powell
mmir@mmir.com
www.mmir.com

THIS PAGE LEFT BLANK

Appendix A

<u>Guide Feedback Form</u>

GAIN Working Group C encourages the submittal of any comments and/or suggestions that will improve the content of future issues of this guide. Please submit this form to:

GAIN Working Group C

c/o Abacus Technology Corporation
5454 Wisconsin Ave. NW, Suite 1100
Chevy Chase, MD 20815; USA
Fax: +1 (301) 907-0036

Name: ____

Title/Position: ____

Company: ____

Mailing Address: ____

Phone/Fax Number: ____

E-Mail:____

1) How useful is this guide on safety sharing systems to your organization? *(Please circle one)*

not useful - 1 2 3 4 5 - very useful

Comments:____

____

2) What information contained in this guide is most useful to your organization?

____

____

3) What information would you like to see added to this guide?

____

____

4a) Which safety sharing systems shown in this guide have you or your organization used?

____

____

____

4b) Please provide any comments that you would like to share with WG C regarding these safety-sharing systems.

____

____

____

5) What safety sharing system does your organization need but does not have now?

____

____

____

6) What are the most significant challenges your organization faces in using or implementing safety sharing systems? *(Please circle or underline all that apply)*

Management Support	Money
Time	Resources
Knowledge of Existing Tools	Experience
Training	Software/Hardware Limitations
Information Security	Other: ______________________________

7) What activities should WG C undertake that would be most useful to you and your organization?

____

____

8) Would you or someone in your organization be interested in participating in WG C activities? **YES / NO** Would you like to be added to our mailing list? **YES / NO**

Other Comments/Suggestions: ____

____

____

____

Appendix B

List of Acronyms and Abbreviations

AAIC	Aircraft Accident Investigation Committee
AASES	ATA - Aviation Safety Exchange System
AQD	Aviation Quality Database
ASDSS	Aviation Safety Data Sharing System
ASI-NET	Aviation Safety Information Network
ASN	Aviation Safety Network
ASR	Air Safety Reporting
ATA	Air Transportation Association
ATEC	Association of Air Transport Engineering and Research
AVSiS	Aviation Safety Information System
BA	British Airways
BASIS	British Airways Safety Information System
BMI	British Midland Airways Ltd
CAA	Civil Aviation Authority
CAST	Commercial Aviation Safety Team
CICTT	CAST/ICAO Common Taxonomy Team
COTS	Commercial Off the Shelf
CSV	Comma Separated Value
CVR	Cockpit Voice Recorder
DB	Database
FAA	Federal Aviation Administration
FOQA	Flight Operational Quality Assurance
FTP	File Transfer Protocol
GAIN	Global Aviation Information Network
HAI	Helicopter Association International
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFSC	Italian Flight Safety Committee
INFOSEC	Information Society of the European Commission
IOSA	IATA Operational Safety Audit
IT	Information Technology
JCAB	Japan Civil Aeronautics Board
LOSA	Line-Oriented Safety Assessment

List of Acronyms and Abbreviations
(continued)

MMIR	Maintenance Malfunction Information Report
MMS	Make, Model, Series
MOU	Memorandum of Understanding
NTSB	National Transportation Safety Board
ODBC	Open Database Connectivity
OEMs	Original Equipment Manufacturers
PC	Personal Computer
PKI	Public-Key Infrastructure
SAC	Safety Advisory Committee
SDR	Service Difficulty Report
SIE	Safety Information Exchange
SRA	Systems, Research and Analysis
SSL	Secure Socket Layering
SSR	Standard Sharing Report
STEADES	Safety Trend Evaluation and Data Exchange System
SWAP	Safety With Answers Provided
TSB	Transportation Safety Board
XML	Extensible Markup Language
XSLT	Extensible Style Language Transformation