Work Group C is seeking volunteers to work on this task. To volunteer, comment, or request additional information, please contact:

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Additional information on GAIN and Work Group C can be found on the GAIN web-site at *www.gainweb.org*.

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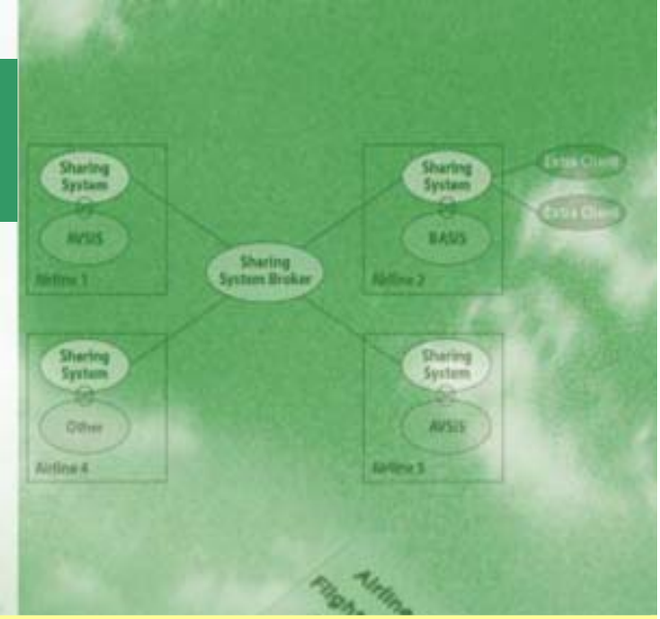
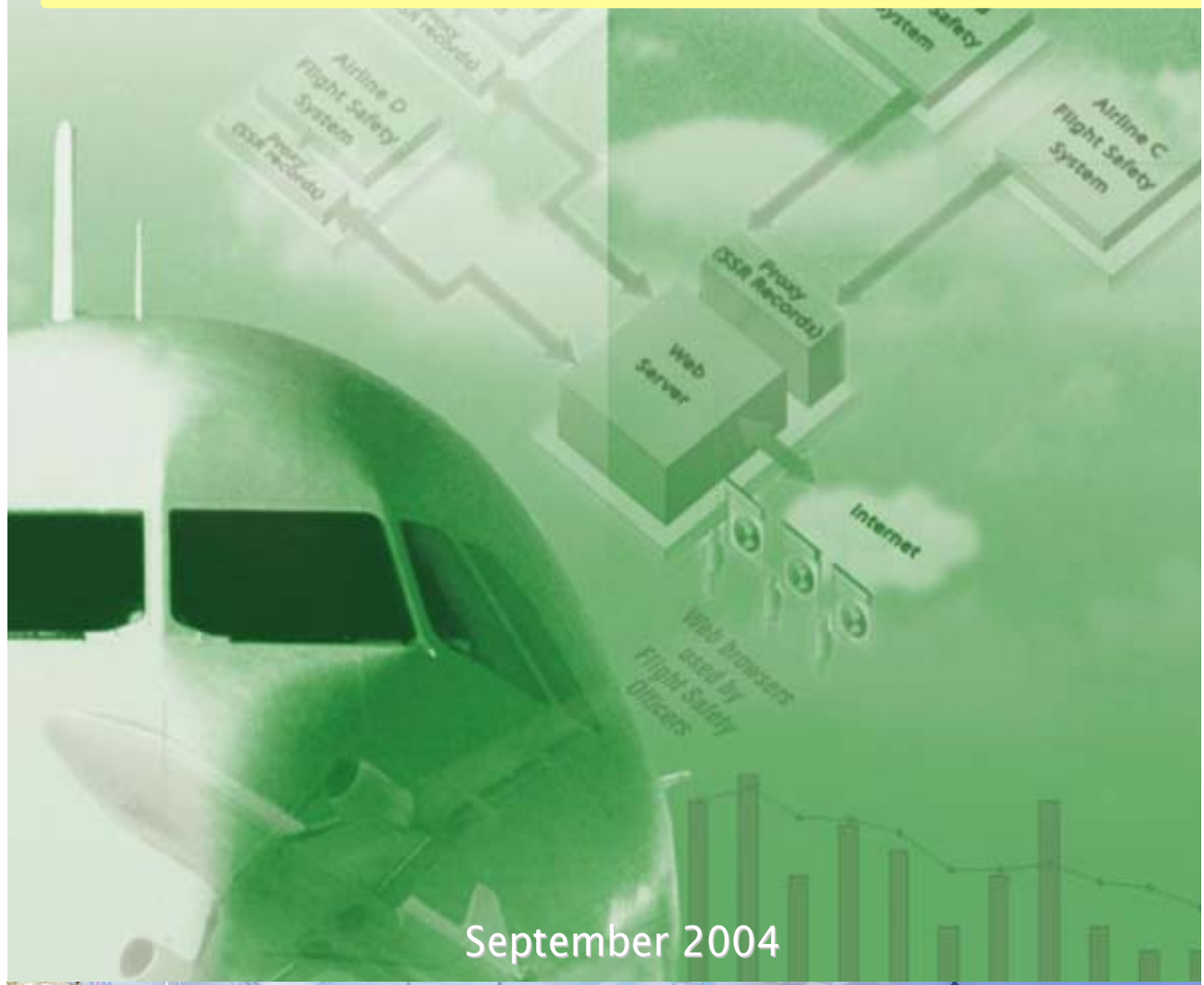
Statement of Purpose

Safety Event Descriptor Codes International Standards Development





September 2004

Global Aviation Information Network
ENHANCING AVIATION SAFETY THROUGH SHARING

Background

One of the main purposes of Work Group C – Global Information Sharing Systems (WG C) is to promote the advancement of information sharing across the aviation safety community. In order to share information more easily, it needs to have a common language. This language includes definitions for common terms, data standards, and classification systems. Today's environment includes a mixed assortment of languages. This is a result of several factors within the industry: proprietary information, proprietary classification systems, homegrown systems, Civil Aviation Authority standards, and international standards designed for accident reporting. Each effort resulted in a taxonomy that fulfills the needs of a limited group within the international aviation community, but is not readily applied to all those that would benefit from the exchange of data.

The needs of the community as an entity to be able to exchange data easily are not served very well by these efforts. Some proprietary systems encourage the sharing of events amongst their customers by not allowing customization of the classification system, but there was no general requirement to share between airlines using different systems. The requirement was never established because there was no pressing need. From an economic perspective, there was perceived to be little benefit to the investment. Event information was closely held to protect the airlines, the flying crew and ground crews, and the public perception of flight safety at the individual airlines.

The definitions for specific event types can vary from taxonomy to taxonomy, and the taxonomies are defined along different dimensions making it difficult to share data amongst different systems without losing valuable information. As an example, risk thresholds used to determine the severity of an event will vary from airline to airline. They also use different risk assessment methods. As a result, two given taxonomies could cover the same range of safety events across multiple dimensions, whilst having different data at the detailed level of individual events. To compare information from multiple sources, we must have a common definition for each and every safety event type together with the classification process that describes them. Currently, we resort to mapping codes across taxonomies with disparate event definitions. This results in the loss of information and a reduction in the value of the analysis.

In the larger context of aviation safety, there is a disconnect between and amongst airlines, manufacturers, educators, ATM providers and regulatory authorities. Most organizations work on establishing a taxonomy to support only their own requirements and each organization works from a different set of definitions. This creates a loophole where two or more groups could classify an event with contradicting descriptors. This introduces both Type 1 and Type 2 errors into the process. A Type 1 error is defined as a 'False Negative' and a Type 2 error is defined as a 'False Positive'. Events will be found by analysts when the nature of the events differ from the subject matter of the investigation, ergo a Type 1 error. Meanwhile,

Statement of Purpose – Safety Event Descriptor Codes International Standards Development

Glossary

ATM	Air Traffic Management
Aviation Safety	The condition of being safe or freedom from danger, risk, or injury in all facets of aviation operations.
BASIS	British Airways Safety Information System
Classification System	An organized set of descriptive references used to segment a set of items into subsets with comparable attributes.
Data Standard	Data coordinated through an approved standardization process to maintain consistency and reduce redundancies by optimization methods such as data modeling, domain value analysis, and data scrubbing.
ECCAIRS	European Co-ordination Centre for Aviation Incident Reporting Systems
Event Descriptor	An encoded description used to classify an event based upon a predefined set of attributes
Flying Crew	The Pilot and First Officer flying the aircraft at the time of an event
Ground Crew	Personnel responsible for the handling of an aircraft while it is on the ground. This includes everyone responsible for the preparation for departure or arrival.
Harmonize	The process of reconciling two or more models. Harmonization involves identifying cases in which the same structure appears in both models, and ensuring that the representation is consistent across both models.
IATA	International Air Transportation Association
ICAO	International Civil Aviation Organization
Safety Event Management System	A software system used to facilitate the effective collection and analysis of event information.
STEADES	Safety Trend Evaluation, Analysis & Data Exchange System
Taxonomy	The study of the general principles of scientific classification, especially the orderly classification of items according to their presumed natural relationships.

About GAIN and Work Group C

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.

The GAIN organization consists of an industry-led Steering Committee, three work 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 work 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 work groups are interdisciplinary industry and government teams that work GAIN tasks within the action plans established by the Steering Committee. The current GAIN work groups are: Work Group B – Analytical Methods and Tools, Work Group C – Global Information Sharing Systems, and Work Group E – Flt Ops/ATC Ops Safety Information Sharing. The Program Office provides technical and administrative support to the Steering Committee, work groups, and Government Support Team.

GAIN Work Group C (WG 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
- Promote aviation industry sharing systems
- Facilitate the development of a system to share safety lessons learned and corrective actions within the aviation community.

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. Membership within WG C is open to 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, on average, every 2 to 3 months since 1999, held teleconferences between meetings, and have exchanged ideas, information, and draft products by e-mail. The members volunteer to work on various tasks within the Work Plans and collaborate with other WG C members to assess progress and improve on interim products.

the same events are missed by analysts hoping to find such information, which is a Type 2 error. The end result is a loss of confidence in the source of information.

Objective

WG C is establishing a task to harmonize the existing event descriptor environment as used by safety event management systems to facilitate information sharing within the international airline community. This will be accomplished using a multi-tiered approach.

1. Task Scope – To define the scope of this effort, safety events will be partitioned into 'areas of responsibility'. These areas will be based on the analysis performed to define specific taxonomy objectives. Selected 'areas of responsibility' will be addressed by this effort to assure the task is of manageable size and scope.
2. Environmental Assessment – The first activity will be to assess existing taxonomies identifying both positive and negative attributes. Attributes will be recorded and noted for the reasoning behind each attribute assessment. The assessment should also include new attributes missing from earlier models.
3. Model Definition – This activity establishes the baseline to build a new taxonomy exhibiting the best attributes found in the environmental assessment.
4. Descriptor Development – The new model will be used to develop a new set of descriptors that will populate the new standard.
5. Transition Management – Translation and system transition primers will be developed to prepare the aviation safety community to assess the impact of the new standard and prepare for implementation and transition. Airlines that are initiating safety event management systems will be able to start by using this new standard.

To gain a wider acceptance of the final model, an attempt will be made to incorporate legacy descriptors into the model when and where applicable, and a transition process developed. This is intended to promote acceptance through familiarity and expediting proficiency. The acceptance of a harmonized solution will be accepted by the community only if it is a logical extension to the existing base of standards work, clearly defines the area of applicability, and includes instruction for transition. The model will be distributed within the industry for comments throughout the development process. Model definitions must be very stable at final acceptance to achieve buy-in from the industry. This does not preclude the option of adding new codes at a future date so long as they are based upon the existing model and do not change the definition of any other event descriptor in the taxonomy.

Task participants will be canvassed from the existing aviation community working on data standards. Individuals will be recruited based upon past experience working on

international standards efforts, systems projects covering safety event tracking, and/or aviation safety analysis and research. The preferred task team will consist of six to eight participants, with each participant committing their support plus meeting attendance. It is proposed that participants will meet on a bi-monthly basis by teleconference and/or in person during the task.

Potential participants should come from the ECCAIRS project, ICAO, IATA, airlines, research groups, and software vendors (e.g., BASIS, Superstructure, and AvSoft). Throwing a new standard over the wall at some point in the future, without the involvement of organizations that can approve, implement, and maintain the standard, will significantly reduce the chances of success. By including participants from the major parties in the community, those individuals that can direct the effort, assuring the products fit within any mandatory guidelines, will have been provided the opportunity to comment. This will facilitate organizational approval and community acceptance.

One important fact to note on this effort is that it is not a software standard. This task seeks to harmonize existing descriptor taxonomies to facilitate the sharing and analysis of safety event information.

Benefits

- Data Sharing – One of the objectives for WG C is to bring down the cost of data ownership. Each time there is a need to translate data for any purpose, cost of ownership increases. Airlines assess the benefit of sharing versus the costs as part of their business case analysis. For example, there are two ways that a non-BASIS airline can participate in STEADES: change software vendors, or convert data into the STEADES format. Conversion could mean using automated and manual processes to assure data quality. A data quality process is necessary because we are not only reformatting to a new data schema, but we are also translating data from one language to another. Both of these examples result in an increased cost of ownership. If, on the other hand, we can perform a data conversion that doesn't require a manual QA task, because we are using data standards such as the event descriptor, the cost of ownership is minimized while realizing the benefits of sharing.
- One Language – One of the benefits to be realized in this data standards initiative is the standardization of event type definitions. Using this common definition, information sharing initiatives increase in realized value because now all the information can be considered with a clear understanding of the content. There is no longer the need to reassess the content to assure that the information correlates to the event descriptor data. The airlines regularly state their interest is in the sharing of information, and not raw data. The event descriptor standard will support this request by ensuring provided information is validated through the quality checks built into the descriptor standard.
- Analysis – Reductions in cost of ownership can also be realized in the analysis of information. By eliminating data translation and/or integration processes in the

analysis, we have reduced the time it takes to prepare the data for analysis. If resources are a fixed asset within the airline safety office, there is now time to perform additional analysis using the time saved during the data importing. The cost of ownership is unchanged, but we are now deriving additional benefit of the fixed cost of ownership.

Proposed Schedule

The task will be expedited for delivery at a future GAIN World Conference. The need to expedite completion is also predicated on the requirements of the software vendor community. The expectation is that the new descriptor codes will be incorporated into existing safety event management system applications and information sharing programs (e.g., STEADES). Developers will need time to perform impact assessments, schedule development tasks, and roll out new software. With an expedited schedule for this task, hopefully we could realize benefit from this task within two years from its initiation.

The task will be divided into two phases: Descriptor Framework and Descriptor Creation. The Descriptor Framework will focus on establishing the organizational and classifying structure of the new taxonomy. Descriptors will be created by individual groups of domain experts. Each task group will coordinate with the others to resolve design and redundancy issues.

Proposed Date	Milestone(s)	Comments
September 2004	Statement of Purpose	SOP provided for comment at GAIN VII
October 2004	Draft Action Plan	Plan will include the participants in the Descriptor Framework phase.
March 2005	Framework Completed	Framework is completed, and all deliverables are defined.
June 2005	Comment Period Ends	Completion of a formal comment period for the new taxonomy and transition plans.
March 2006	Descriptors Completed	All descriptors and codes are defined and populated into database.
June 2006	Comment Period Ends	Completion of a formal comment period for the new descriptors and codes.
September 2006	Documentation Package Completed	Framework specification, transition primer, and implementation guides completed.